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European Patent and Trademark Attorneys

## **Patent Basic 2**

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October 2, 2018

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# Focus on inventive step

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REMEMBER: “problem-and-solution approach“

deviation from this approach should be **exceptional**.

Three main stages:

- (i) determining the "closest prior art",
- (ii) establishing the "objective technical problem" to be solved,
- (iii) considering whether or not the claimed invention, starting from the closest prior art and the objective technical problem, would have been obvious to the skilled person.

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## Determination of the closest prior art

The closest prior art is that which **in one single reference** discloses the combination of features which constitutes the **most promising starting point for a development leading to the invention.**

In selecting the closest prior art, the first consideration is that it should be directed to a similar purpose or effect as the invention or at least belong to the same or a closely related technical field as the claimed invention.

In practice, **the closest prior art is generally that which corresponds to a similar use and requires the minimum of structural and functional modifications to arrive at the claimed invention.**

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## Formulation of the objective technical problem

To do this one studies the application (or the patent), the closest prior art and the difference (also called "the distinguishing feature(s)" of the claimed invention) in terms of features (either structural or functional) between the claimed invention and the closest prior art, **identifies the technical effect resulting from the distinguishing features**, and then formulates the technical problem.

In the context of the problem-and-solution approach, the technical problem means the aim and task of modifying or adapting the closest prior art to provide the technical effects that the invention provides over the closest prior art.

The technical problem thus defined is often referred to as the "*objective technical problem*".

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## Could/would approach

In the third stage the question to be answered is whether there is any teaching in the prior art as a whole that would (not simply could, but would) have prompted the skilled person, faced with the objective technical problem, to modify or adapt the closest prior art while taking account of that teaching, thereby arriving at something falling within the terms of the claims, and thus achieving what the invention achieves.

In other words, the point is not whether the skilled person **could** have arrived at the invention by adapting or modifying the closest prior art, but whether he **would** have done so because the prior art incited him to do so in the hope of solving the objective technical problem or in expectation of some improvement or advantage.

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## Combining pieces of prior art

In the context of the problem-solution approach, it is permissible to combine the disclosure of one or more documents, parts of documents or other pieces of prior art (e.g. a public prior use or unwritten general technical knowledge) with the closest prior art. However, the fact that more than one disclosure must be combined with the closest prior art in order to arrive at a combination of features may be an indication of the presence of an inventive step

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**Example:**

The invention relates to a building structure made from aluminium.

A prior document discloses the same structure and says that it is of light-weight material but fails to mention the use of aluminium

***Not inventive:***

*The teaching of a prior document is incomplete and at least one of the possible ways of "filling the gap" which would naturally or readily occur to the skilled person results in the invention.*



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**Example:**

The invention relates to a pump which differs from a known pump solely in that its motive power is provided by a hydraulic motor instead of an electric motor.

***Not inventive:***

*The invention differs from the known art merely in the use of well-known equivalents (mechanical, electrical or chemical).*

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**Example:**

Washing composition containing as detergent a known compound having the known property of lowering the surface tension of water, this property being known to be an essential one for detergents.

***Not inventive:***

*The invention consists merely in a new use of a well-known material employing the known properties of that material.*

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# How a patent appears

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- bibl. data
- abstract
- drawing

 Europäisches Patentamt European Patent Office Office européen des brevets		 Publication number: <b>0 287 349 B1</b>
<b>EUROPEAN PATENT SPECIFICATION</b>		
Date of publication of patent specification: <b>12.08.92</b>		Int. Cl. <sup>5</sup> : <b>H01R 13/719</b>
Application number: <b>88303316.9</b>		
Date of filing: <b>13.04.88</b>		
<b>Filtering electrical connector.</b>		
Priority: <b>13.04.87 US 37505</b>	Proprietor: <b>G &amp; H Technology, Inc.</b> <b>1649 17th Street</b> <b>Santa Monica, California 90404(US)</b>	
Date of publication of application: <b>19.10.88 Bulletin 88/42</b>	Inventor: <b>Tang, Tian-Peng</b> <b>22117, De La Osa Street</b> <b>Woodland Hills California 91369(US)</b>	
Publication of the grant of the patent: <b>12.08.92 Bulletin 92/33</b>	Representative: <b>Brereton, Paul Arthur et al</b> <b>REDDIE &amp; GROSE 16 Theobalds Road</b> <b>London WC1X 8PL(GB)</b>	
Designated Contracting States: <b>AT BE CH DE ES FR GB GR IT LI LU NL SE</b>	References cited: EP-A- 0 089 558 EP-A- 0 091 867 EP-A- 0 123 457 DE-A- 3 030 843 US-A- 4 494 092	

EP 0 287 349 B1

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Rank Xerox (UK) Business Services

**United States Patent** [19]

Tang

[11] Patent Number: **4,867,706**

[45] Date of Patent: **Sep. 19, 1989**

[54] **FILTERED ELECTRICAL CONNECTOR**  
 [75] Inventor: **Tian-Peng Tang**, Woodland Hills, Calif.  
 [73] Assignee: **G & H Technology, Inc.**, Santa Monica, Calif.  
 [21] Appl. No.: **37,505**  
 [22] Filed: **Apr. 13, 1987**  
 [51] Int. Cl.<sup>3</sup>: **H01R 13/66**  
 [52] U.S. Cl.: **439/620; 333/185**  
 [58] Field of Search: **333/181-185; 439/620, 608**

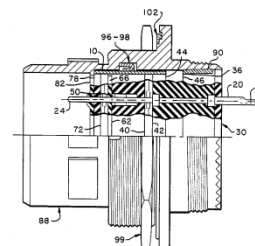
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Primary Examiner—Gary F. Puzman  
 Attorney, Agent, or Firm—George J. Netter

[57] **ABSTRACT**  
 A filter connector comprising a conductive housing containing a pin array traversing corresponding holes in a grommet, a dielectric body, a planar capacitor array, ferrite inductor beads mounted on at least some of the pins, a non-conductive body to insulate said beads from one another and from said capacitor, a non-conductive seal, a second capacitor array, a second grommet, a second interface seal; a grounding cylinder surrounding said capacitor arrays and said beads in an electrical contact with a ring of contact fingers mounted in the interior of said housing. Optionally, a conductive O-ring encircles said shell, to improve shielding.

4 Claims, 1 Drawing Sheet



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- prior art and limits
- brief summary
- detailed description
- (best embodiment)

0 287 349

### Description

#### FILTERING ELECTRICAL CONNECTOR

This invention relates to a multi-pin electrical connector with built-in electromagnetic interference (EMI) filtering capability.

5 Filtering multi-pin electrical connectors to combat EMI problems, are known. It is usual to make these connectors with ceramic capacitors and inductors; these elements are brittle and so fragile; these connectors do not provide the desired reliability. Also prior filter connectors are deficient in electrical continuity of the filter circuits and in provision of good attenuation. Arcing between inductors is a problem in some of these.

10 Objects of this invention at least in its preferred form are:- to provide a multi-pin filter connector that possesses internal electrical integrity,

to provide connector that resists EMI coupling through plug/receptacle interfaces and accessory interfaces;

to provide is such a connector that is ruggedly constructed and has high resistance to element breakage to eliminate arcing between inductors or inductor/capacitor;

15 to provide a connector that provides good attenuation;  
and to provide such a connector that provides high reliability performance and meets military performance requirements.

20 The invention is directed to a multi-pin electrical connector providing EMI filtering, for as many as desired of the electrical pins in said connector, which filter connector comprises: a multiplicity of electrical pins; a first non-conductive grommet seal provided with openings for said pins, said grommet being positioned at the outer surface of a dielectric body; which dielectric body has openings corresponding to said pins; a first planar ceramic capacitor array having openings corresponding to said pins; ferrite inductor beads mounted on and around each of said pins which are desired to be filtered; a non-conductive elastomer body provided with openings to accept each of said ferrite/pin assemblies and any non-filter pins, and to insulate said ferrite beads from each other and from said first capacitor; a non-conductive interface seal, provided with openings for said pins, positioned against the outer face of said elastomer body; a second planar ceramic capacitor array having openings corresponding to said pins; a second non-conductive grommet seal, provided with openings for said pins, positioned at the outer face of said second capacitor; a second non-conductive interface seal, provided with openings for said pins, positioned at the outer face of said second grommet; a conductive grounding can encircling said second grommet/first capacitor group of elements and also a portion of said dielectric body, a capable of being placed into electrical contact therewith; a conductive shell adapted for housing aforesaid pin array; and supported within said shell, a conductive ring element providing a multiplicity of resilient contact fingers for making electrical contact with said grounding can and providing an electrical grounding path from said pin array to said shell. Desirably, each of aforesaid two capacitors and each of said traversing pins are soldered together. To further ensure shielding effectiveness at a connector mounting hole a conductive ring, such as an O-ring, is positioned on and around said shell.

35 An embodiment of the invention will now be described by way of example, with reference to the accompanying drawings, of which,

FIG. 1 is a plan view of the electrical ground can used in the filter connector of the invention.

40 FIG. 2 is a side view of the can of FIG. 1, showing the can is in essence a thick foil.

FIG. 3 is a top view of the ground can in its 'formed configuration' herein a cylinder.

FIG. 4 is a side, partial section, view of the filter connector of the invention, having a jam nut style shell.

45 FIGS. 1-3 show the details of the grounding can 10 element of the filter connector of the invention. Can 10 is a conductive strip 12 provided with a number, top and bottom, of tabs 14 and a number of fastener holes 16. The tabs 14 in this embodiment conform to the configuration of the outer surface of the pin array; the invention is not limited to the configuration of FIG. 1.

FIG. 2 shows that can 10 is in essence a foil thickness; which thickness is only that necessary to provide support strength to said pin array.

50 FIG. 3 shows the can 10 in its formed configuration for encircling a hereinafter defined pin array not only to strengthen said pin array but also to permit the conductive strip 12 being placed into electrical contact therewith. In this embodiment can 10 is made from a beryllium copper alloy having a foil thickness such that the formed can is strong enough to support the more fragile elements of the pin array, as well as pass to ground stray electrical currents within the shell of the connector.

55 FIG. 4 shows in partial section one embodiment of the multi-pin electrical filter connector of the invention. This embodiment is a circular, jam nut style configuration. Other configurations may be used and are available in front mount, rear mount, as well as jam nut style. Rectangular is a typical other configuration.

This filter connector comprises a multiplicity of electrical pins (only one pin 20 is shown in FIG. 4) each having a pin contact end 22 and the other end 24. It is to be understood that it is not necessary that all of the pins 20 be filtered. A mix of filtered pins and non-filtered pins fits certain needs. Commonly all pins are filtered.

60 Positioned near the contact end 22 of pin 20 is a first non-conductive grommet seal 30, provided with openings for pins 20 to pass through (traverse). Herein, grommet 30 is made from electrically non-conductive elastomeric material, such as, fluorosilicone rubber. ( As used herein, 'non-conductive' and 'dielectric' are synonyms)

- independent(s)
- dependent

**Claims****MUNICH**

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1. A multi-pin filter electrical connector providing EMI filtering, for as many as desired of the pins in said connector, which filter connector comprises:
  - a multiplicity of electrical pins;
  - a first non-conductive grommet seal provided with openings for said pins, said first grommet being positioned at the outer face of a dielectric body;
  - said dielectric body having openings corresponding to said pins;
  - a first planar ceramic capacitor array having openings corresponding to said pins;
  - ferrite inductor beads mounted on and around each of said pins which are desired to be filtered;
  - a non-conductive elastomer body provided with openings to accept each of said ferrite/pin assemblies and any non-filter pins, and to insulate said ferrite beads from each other and from said first capacitor.
  - a non-conductive interface seal, provided with openings for said pins, positioned against the outer face of said elastomer body;
  - a second planar ceramic capacitor array having openings corresponding to said pins;
  - a second non-conductive grommet seal, provided with openings for said pins, positioned at the outer face of said second capacitor;
  - a second non-conductive interface seal, provided with openings for said pins, positioned at the outer face of said second grommet;
  - a conductive grounding can encircling said second grommet/first capacitor group of aforesaid elements and also a portion of said dielectric body, and capable of being placed into electrical contact therewith;
  - a conductive shell adapted for housing aforesaid pin array; and
  - supported within said shell, a conductive ring element providing a multiplicity of resilient contact fingers for making electrical contact with said grounding can and providing an electrical grounding path from said pin array to said shell.
2. The filter connector of claim 1 wherein each of said two capacitors and each of said traversing pins are soldered together.
3. The filter connector of claim 1 wherein a conductive ring is positioned on and around said shell to further ensure EMI shielding effectiveness at a connector mounting hole.
4. The filter connector of claim 3 wherein said two planar capacitors are soldered to each of said traversing pins.

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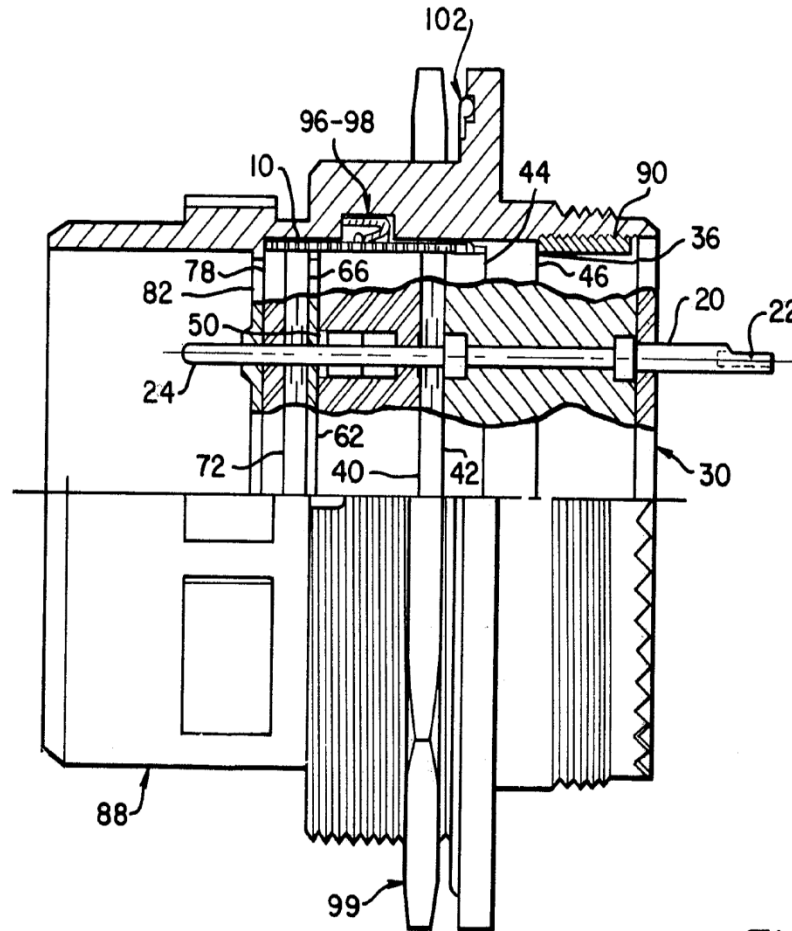


FIG. 4

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**more in detail**



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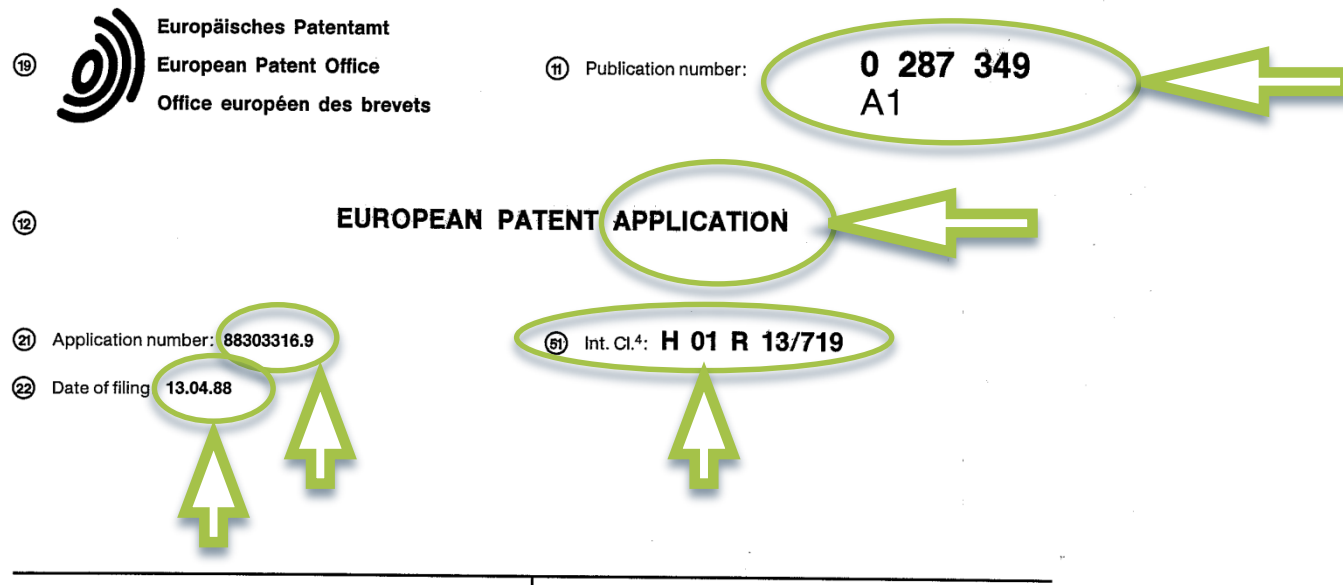
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# info in first page



The image shows a screenshot of the first page of a European Patent Application. The text is annotated with green circles and arrows pointing to specific information:

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**European Patent Office**  
**Office européen des brevets**
- 11** Publication number: **0 287 349 A1**
- 12** **EUROPEAN PATENT APPLICATION**
- 21** Application number: **88303316.9**
- 22** Date of filing: **13.04.88**
- 61** Int. Cl.4: **H 01 R 13/719**

## Ex. 1 EP Application

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**0 287 349 B1**

**EUROPEAN PATENT SPECIFICATION**

**12.08.92** Int. Cl.<sup>5</sup>: **H01R 13/719**

Application number: **88303316.9**

Date of filing: **13.04.88**

*Ex. 2 EP as granted*

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# info in first page

**United States Patent** [19]

**Tang**

[11] **Patent Number:** **4,867,706**

[45] **Date of Patent:** **Sep. 19, 1989**

[54] **FILTERED ELECTRICAL CONNECTOR**

[75] Inventor: **Tian-Peng Tang**, Woodland Hills, Calif.

[73] Assignee: **G & H Technology, Inc.**, Santa Monica, Calif.

[21] Appl. No.: **37,505**

[22] Filed: **Apr. 13, 1987**

[51] Int. Cl.<sup>3</sup> ..... **H01R 13/56**

[52] U.S. Cl. .... **439/620; 333/185**

[53] Field of Search ..... **333/181-185; 439/620, 608**

[56] **References Cited**

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*Primary Examiner*—Gary F. Paumen  
*Attorney, Agent, or Firm*—George J. Netter

[57] **ABSTRACT**

A filter connector comprising a conductive housing containing a pin array traversing corresponding holes in a grommet, a dielectric body, a planar capacitor array, ferrite inductor beads mounted on at least some of the pins, a non-conductive body to insulate said beads from one another and from said capacitor, a non-conductive seal, a second capacitor array, a second grommet, a second interface seal; a grounding cylinder surrounding said capacitor arrays and said beads in an electrical contact with a ring of contact fingers mounted in the interior of said housing. Optionally, a conductive O-ring encircles said shell, to improve shielding.

**4 Claims, 1 Drawing Sheet**

*Ex. 3 US patent*

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# info in first page

<p>③① Priority: <b>13.04.87 US 37505</b></p> <p>④③ Date of publication of application: <b>19.10.88 Bulletin 88/42</b></p> <p>⑧④ Designated Contracting States: <b>AT BE CH DE ES FR GB GR IT LI LU NL SE</b></p>	<p>⑦① Applicant: <b>G &amp; H Technology, Inc.</b> <b>1649 17th Street</b> <b>Santa Monica, California 90404 (US)</b></p> <p>⑦② Inventor: <b>Tang, Tian-Peng</b> <b>22117, De La Osa Street</b> <b>Woodland Hills California 91369 (US)</b></p> <p>⑦④ Representative: <b>Brereton, Paul Arthur et al</b> <b>REDDIE &amp; GROSE 16 Theobalds Road</b> <b>London WC1X 8PL (GB)</b></p>
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# info in description

**known art & limits** →

**scope of the invention** →

**summary, main ideas** →

5 This invention relates to a multi-pin electrical connector with built-in electromagnetic interference (EMI) filtering capability.

10 Filtering multi-pin electrical connectors to combat EMI problems, are known. It is usual to make these connectors with ceramic capacitors and inductors; these elements are brittle and so fragile; these connectors do not provide the desired reliability. Also prior filter connectors are deficient in electrical continuity of the filter circuits and in provision of good attenuation. Arcing between inductors is a problem in some of these.

15 Objects of this invention at least in its preferred form are:- to provide a multi-pin filter connector that possesses internal electrical integrity, to provide connector that resists EMI coupling through plug/receptacle interfaces and accessory interfaces; to provide is such a connector that is ruggedly constructed and has high resistance to element breakage to eliminate arcing between inductors or inductor/capacitor; to provide a connector that provides good attenuation; and to provide such a connector that provides high reliability performance and meets military performance requirements.

20 The invention is directed to a multi-pin electrical connector providing EMI filtering, for as many as desired of the electrical pins in said connector, which filter connector comprises: a multiplicity of electrical pins; a first non-conductive grommet seal provided with openings for said pins, said grommet being positioned at the outer surface of a dielectric body; which dielectric body has openings corresponding to said pins; a first planar ceramic capacitor array having openings corresponding to said pins; ferrite inductor beads mounted on and around each of said pins which are desired to be filtered; a non-conductive elastomer body provided with openings to accept each of said ferrite/pin assemblies and any non-filter pins, and to insulate said ferrite beads from each other and from said first capacitor; a non-conductive interface seal, provided with openings for said pins, positioned against the outer face of said elastomer body; a second planar ceramic capacitor array having openings corresponding to said pins; a second non-conductive grommet seal, provided with openings for said pins, positioned at the outer face of said second capacitor; a second non-conductive interface seal, provided with openings for said pins, positioned at the outer face of said second grommet; a conductive grounding can encircling said second grommet/first capacitor group of elements and also a portion of said dielectric body, a capable of being placed into electrical contact therewith; a conductive shell adapted for housing aforesaid pin array; and supported within said shell, a conductive ring element providing a multiplicity of resilient contact fingers for making electrical contact with said grounding can and providing an electrical grounding path from said pin array to said shell. Desirably, each of aforesaid two capacitors and each of said traversing pins are soldered together. To further ensure shielding effectiveness at a connector mounting hole a conductive ring, such as an O-ring, is positioned on and around said shell.

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## brief description of drawings



An embodiment of the invention will now be described by way of example, with reference to the accompanying drawings, of which.

FIG. 1 is a plan view of the electrical ground can used in the filter connector of the invention.

FIG. 2 is a side view of the can of FIG. 1, showing the can is in essence a thick foil.

FIG. 3 is a top view of the ground can in its 'formed configuration' herein a cylinder.

FIG. 4 is a side, partial section, view of the filter connector of the invention, having a jam nut style shell.

FIGS. 1-3 show the details of the grounding can 10 element of the filter connector of the invention. Can 10 is a conductive strip 12 provided with a number, top and bottom, of tabs 14 and a number of fastener holes 16. The tabs 14 in this embodiment conform to the configuration of the outer surface of the pin array; the invention is not limited to the configuration of FIG. 1.

FIG. 2 shows that can 10 is in essence a foil thickness; which thickness is only that necessary to provide support strength to said pin array.

FIG. 3 shows the can 10 in its formed configuration for encircling a hereinafter defined pin array not only to strengthen said pin array but also to permit the conductive strip 12 being placed into electrical contact therewith. In this embodiment can 10 is made from a beryllium copper alloy having a foil thickness such that the formed can is strong enough to support the more fragile elements of the pin array, as well as pass to ground stray electrical currents within the shell of the connector.

FIG. 4 shows in partial section one embodiment of the multi-pin electrical filter connector of the invention. This embodiment is a circular, jam nut style configuration. Other configurations may be used and are available in front mount, rear mount, as well as jam nut style. Rectangular is a typical other configuration.

This filter connector comprises a multiplicity of electrical pins (only one pin 20 is shown in FIG. 4) each having a pin contact end 22 and the other end 24. It is to be understood that it is not necessary that all of the pins 20 be filtered. A mix of filtered pins and non-filtered pins fits certain needs. Commonly all pins are filtered.

Positioned near the contact end 22 of pin 20 is a first non-conductive grommet seal 30, provided with openings for pins 20 to pass through (traverse). Herein, grommet 30 is made from electrically non-conductive elastomeric material, such as, fluorosilicone rubber. ( As used herein, 'non-conductive' and 'dielectric' are synonyms)

## detailed description



An embodiment of the invention will now be described by way of example, with reference to the accompanying drawings, of which.

FIG. 1 is a plan view of the electrical ground can used in the filter connector of the invention.

FIG. 2 is a side view of the can of FIG. 1, showing the can is in essence a thick foil.

FIG. 3 is a top view of the ground can in its 'formed configuration' herein a cylinder.

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# info in claims

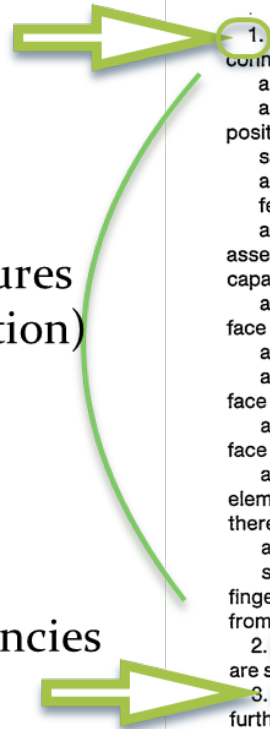
claim number

**Claims**

1. A multi-pin filter electrical connector providing EMI filtering, for as many as desired of the pins in said connector, which filter connector comprises:
  - a multiplicity of electrical pins;
  - a first non-conductive grommet seal provided with openings for said pins, said first grommet being positioned at the outer face of a dielectric body;
  - said dielectric body having openings corresponding to said pins;
  - a first planar ceramic capacitor array having openings corresponding to said pins;
  - ferrite inductor beads mounted on and around each of said pins which are desired to be filtered;
  - a non-conductive elastomer body provided with openings to accept each of said ferrite/pin assemblies and any non-filter pins, and to insulate said ferrite beads from each other and from said first capacitor.
  - a non-conductive interface seal, provided with openings for said pins, positioned against the outer face of said elastomer body;
  - a second planar ceramic capacitor array having openings corresponding to said pins;
  - a second non-conductive grommet seal, provided with openings for said pins, positioned at the outer face of said second capacitor;
  - a second non-conductive interface seal, provided with openings for said pins, positioned at the outer face of said second grommet;
  - a conductive grounding can encircling said second grommet/first capacitor group of aforesaid elements and also a portion of said dielectric body, and capable of being placed into electrical contact therewith;
  - a conductive shell adapted for housing aforesaid pin array; and
  - supported within said shell, a conductive ring element providing a multiplicity of resilient contact fingers for making electrical contact with said grounding can and providing an electrical grounding path from said pin array to said shell.
2. The filter connector of claim 1 wherein each of said two capacitors and each of said traversing pins are soldered together.
3. The filter connector of claim 1 wherein a conductive ring is positioned on and around said shell to further ensure EMI shielding effectiveness at a connector mounting hole.
4. The filter connector of claim 3 wherein said two planar capacitors are soldered to each of said traversing pins.

claimed features  
(in combination)

dependencies



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# Patent family



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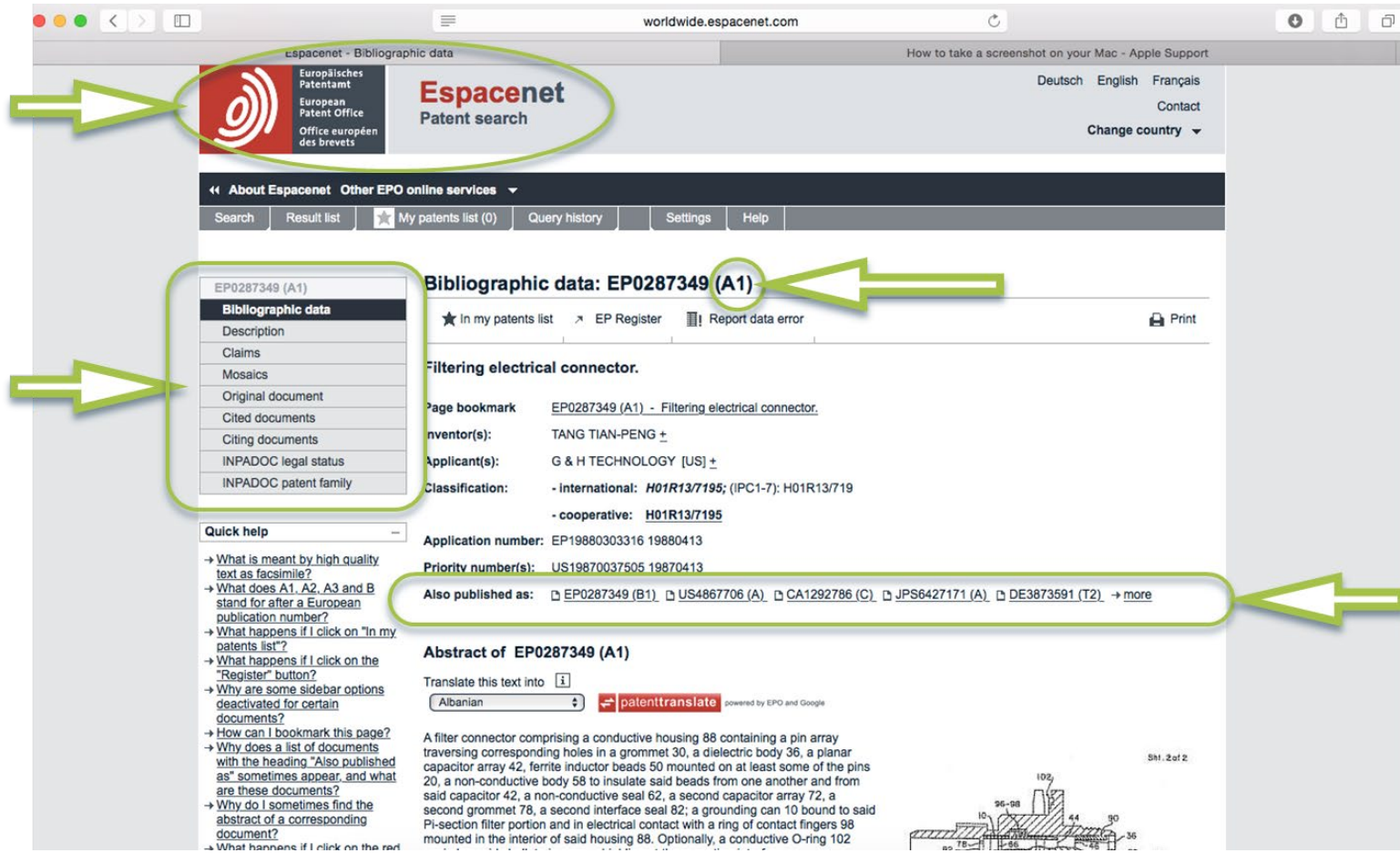
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- Header:** Espacenet - Bibliographic data, Espacenet Patent search, and language options (Deutsch, English, Français).
- Navigation:** Search, Result list, My patents list (0), Query history, Settings, Help.
- Search Results:** EP0287349 (A1) - Filtering electrical connector.
- Patent Details:**
  - Inventor(s):** TANG TIAN-PENG ±
  - Applicant(s):** G & H TECHNOLOGY [US] ±
  - Classification:** International: H01R13/7195; (IPC1-7): H01R13/719
  - Application number:** EP19880303316 19880413
  - Priority number(s):** US19870037505 19870413
  - Also published as:** EP0287349 (B1), US4867706 (A), CA1292786 (C), JPS6427171 (A), DE3873591 (T2).
- Abstract:** A filter connector comprising a conductive housing 88 containing a pin array traversing corresponding holes in a grommet 30, a dielectric body 36, a planar capacitor array 42, ferrite inductor beads 50 mounted on at least some of the pins 20, a non-conductive body 58 to insulate said beads from one another and from said capacitor 42, a non-conductive seal 62, a second capacitor array 72, a second grommet 78, a second interface seal 82; a grounding can 10 bound to said Pi-section filter portion and in electrical contact with a ring of contact fingers 98 mounted in the interior of said housing 88. Optionally, a conductive O-ring 102
- Technical Drawing:** A cross-sectional diagram of the filter connector with numbered components (10, 20, 30, 36, 42, 44, 50, 58, 62, 72, 78, 82, 88, 90, 98, 102).

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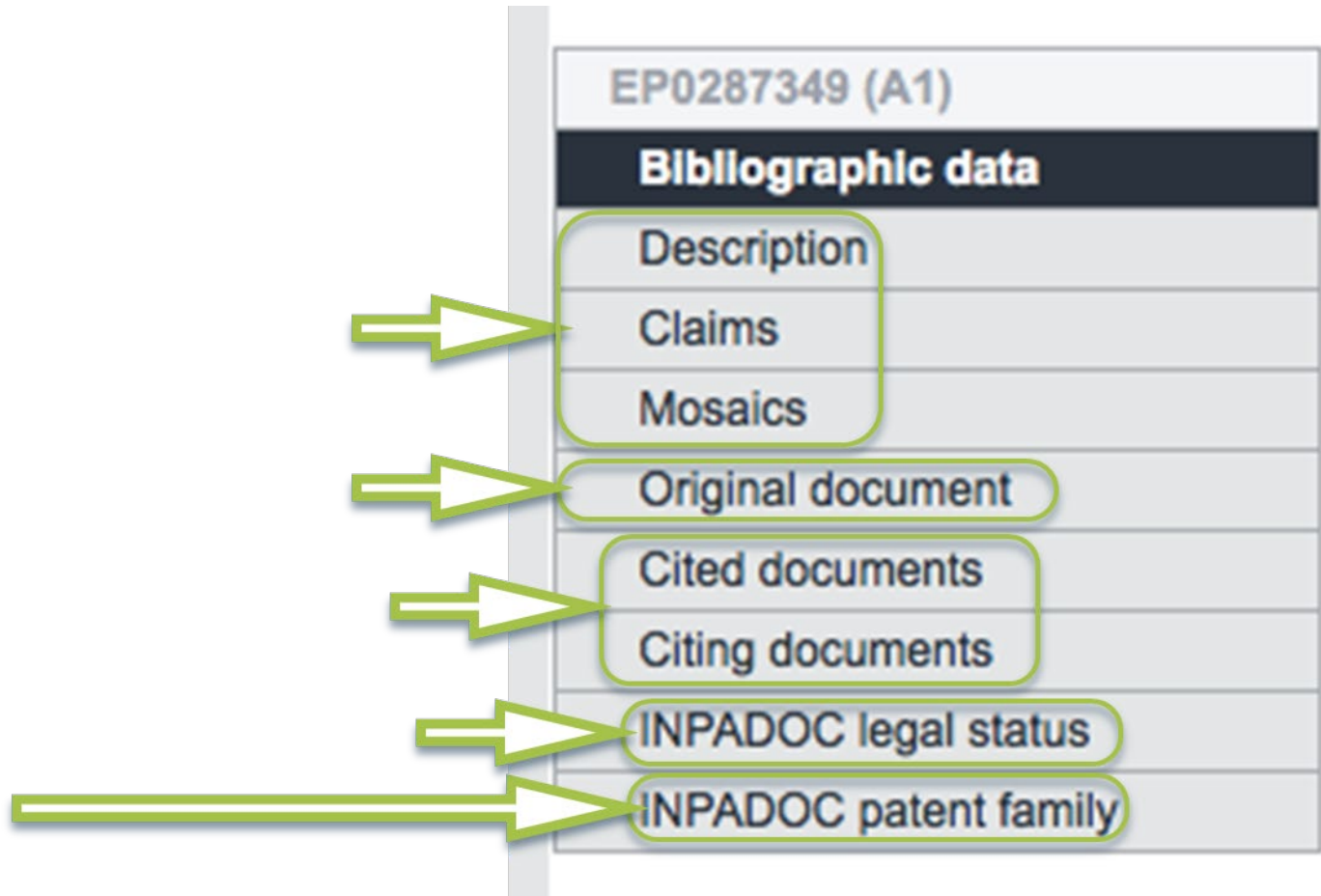
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Espacenet

Family list: EP0287349 (A1) — 1988-10-19

7 application(s) for: EP0287349 (A1)

1. <u>Filtering electrical connector.</u>					
Inventor: TANG TIAN-PENG	Applicant: G & H TECHNOLOGY [US]	CPC: H01R13/7195	IPC: H01R13/7195 (IPC1-7): H01R13/719	Publication info: EP0287349 (A1) 1988-10-19 EP0287349 (B1) 1992-08-12	Priority date: 1987-04-13
2. <u>ELEKTRISCHER STECKER MIT FILTER.</u>					
Inventor: TANG TIAN-PENG	Applicant: G & H TECHNOLOGY [US]	CPC:	IPC: H01R13/719 (IPC1-7): H01R13/719	Publication info: AT79491 (T) 1992-08-15	Priority date: 1987-04-13
3. <u>FILTERING ELECTRICAL CONNECTOR</u>					
Inventor: TANG TIAN-PENG [US]	Applicant: TANG TIAN PENG [US]	CPC: H01R13/7195	IPC: H01R13/7195 (IPC1-7): H01R13/66 H01R13/719	Publication info: CA1292788 (C) 1991-12-03	Priority date: 1987-04-13
4. <u>Filtering electrical connector.</u>					
Inventor: TANG TIAN-PENG [US]	Applicant: G & H TECHNOLOGY [US]	CPC: H01R13/7195	IPC: H01R13/7195 (IPC1-7): H01R13/719	Publication info: DE3873591 (T2) 1993-01-21	Priority date: 1987-04-13
5. <u>FILTERING ELECTRICAL CONNECTOR</u>					
Inventor:	Applicant: G & H TECHNOLOGY [US]	CPC: H01R13/7195	IPC: H01R13/7195 (IPC1-7): H01R13/66	Publication info: IL88054 (A) 1991-06-30	Priority date: 1987-04-13
6. <u>MULTIPOSITION ELECTRIC FILTER CONNECTOR</u>					
Inventor: TEIAN PEN TAN	Applicant: G & H TECHNOL INC	CPC: H01R13/7195	IPC: H01R13/7195 (IPC1-7): H01R13/719	Publication info: JPS6427171 (A) 1989-01-30	Priority date: 1987-04-13
7. <u>Filtered electrical connector</u>					
Inventor: TANG TIAN-PENG [US]	Applicant: G & H TECHNOLOGY [US]	CPC: H01R13/7195	IPC: H01R13/7195 (IPC1-7): H01R13/66	Publication info: US4867706 (A) 1989-09-19	Priority date: 1987-04-13



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# Patent status

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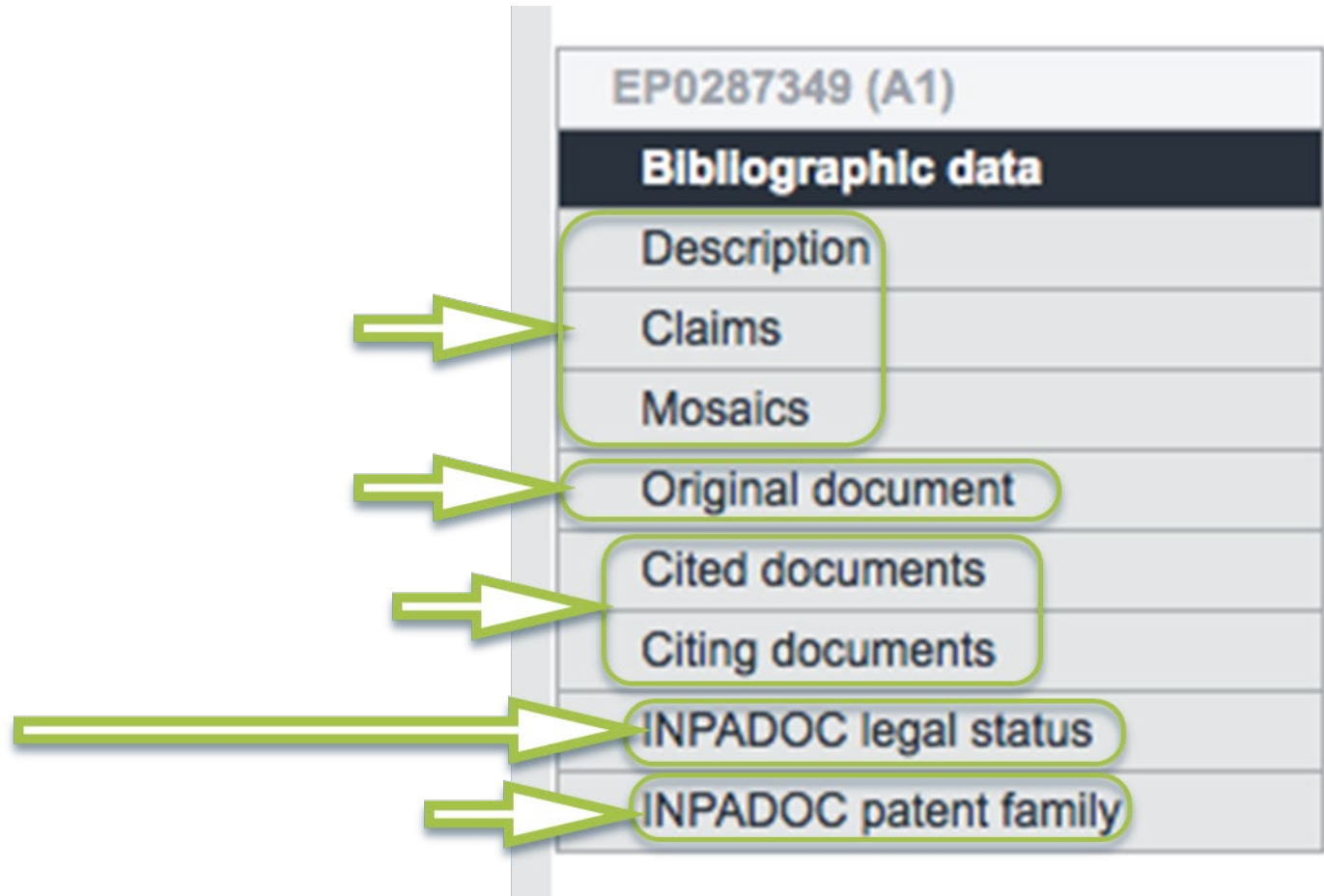
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Espacenet

INPADOC legal status: EP0287349 (A1) — 1988-10-19

Filtering electrical connector.

The EPO does not accept any responsibility for the accuracy of data and information originating from other authorities than the EPO; in particular, the EPO does not guarantee that they are complete, up-to-date or fit for specific purposes.

Legal status of EP0287349 (A1) 1988-10-19; EP0287349 (B1) 1992-08-12:

EPF 88303316 A (Patent of invention)

Event date : 1988/10/19  
Event code : AK  
Code Expl.: + DESIGNATED CONTRACTING STATES:  
KD OF CORRESP. PAT. : A1  
DESIGNATED COUNTR. : AT BE CH DE ES FR GB GR IT LI LU NL SE

Event date : 1989/05/24  
Event code : 17P  
Code Expl.: + REQUEST FOR EXAMINATION FILED  
EFFECTIVE DATE : 19890320

Event date : 1991/11/21  
Event code : 17Q  
Code Expl.: + FIRST EXAMINATION REPORT  
EFFECTIVE DATE : 19911004

Event date : 1992/07/27  
Event code : ITF  
Code Expl.: + IT: TRANSLATION FOR A EP PATENT FILED  
NEW OWNER : BARZANO' E ZANARDO ROMA S.P.A.

(...)

Event code : 26  
Code Expl.: - OPPOSITION FILED  
OPPONENT NAME : ENDRESS + HAUSER FLOWTEC AG  
EFFECTIVE DATE : 19930507

Event date : 1994/04/13  
Event code : PG25 GB  
Code Expl.: - LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO  
EFFECTIVE DATE : 19940413

Event date : 1994/12/07  
Event code : GBPC  
Code Expl.: - GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE  
EFFECTIVE DATE : 19940413

Event date : 1995/02/24  
Event code : REG FR ST  
Code Expl.: - NOTIFICATION OF LAPSE

Event date : 1995/02/28  
Event code : REG CH PL  
Code Expl.: - PATENT CEASED

Event date : 1995/03/01  
Event code : 27W  
Code Expl.: - REVOKED  
EFFECTIVE DATE : 19940926

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# Patent file inspection

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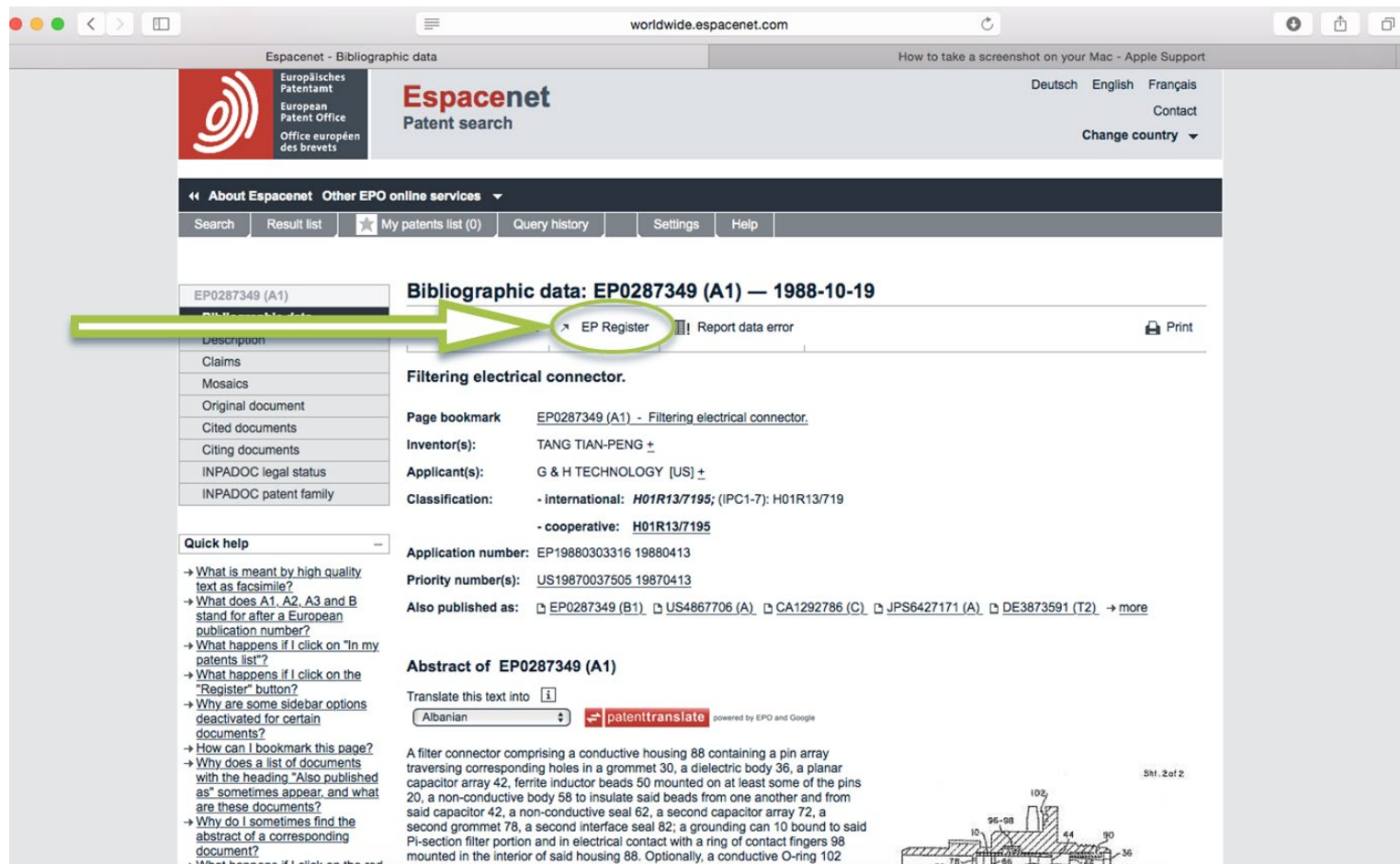
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EP0287349 (A1)

**Bibliographic data: EP0287349 (A1) — 1988-10-19**

EP Register Report data error Print

**Filtering electrical connector.**

**Page bookmark** EP0287349 (A1) - Filtering electrical connector.

**Inventor(s):** TANG TIAN-PENG ±

**Applicant(s):** G & H TECHNOLOGY [US] ±

**Classification:**  
- international: **H01R13/7195**; (IPC1-7): H01R13/719  
- cooperative: **H01R13/7195**

**Application number:** EP19880303316 19880413

**Priority number(s):** US19870037505 19870413

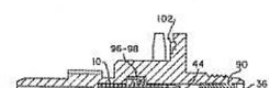
**Also published as:** EP0287349 (B1) US4867706 (A) CA1292786 (C) JPS6427171 (A) DE3873591 (T2) → more

**Abstract of EP0287349 (A1)**

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A filter connector comprising a conductive housing 88 containing a pin array traversing corresponding holes in a grommet 30, a dielectric body 36, a planar capacitor array 42, ferrite inductor beads 50 mounted on at least some of the pins 20, a non-conductive body 58 to insulate said beads from one another and from said capacitor 42, a non-conductive seal 62, a second capacitor array 72, a second grommet 78, a second interface seal 82; a grounding can 10 bound to said Pi-section filter portion and in electrical contact with a ring of contact fingers 98 mounted in the interior of said housing 88. Optionally, a conductive O-ring 102

SH: 2 of 2





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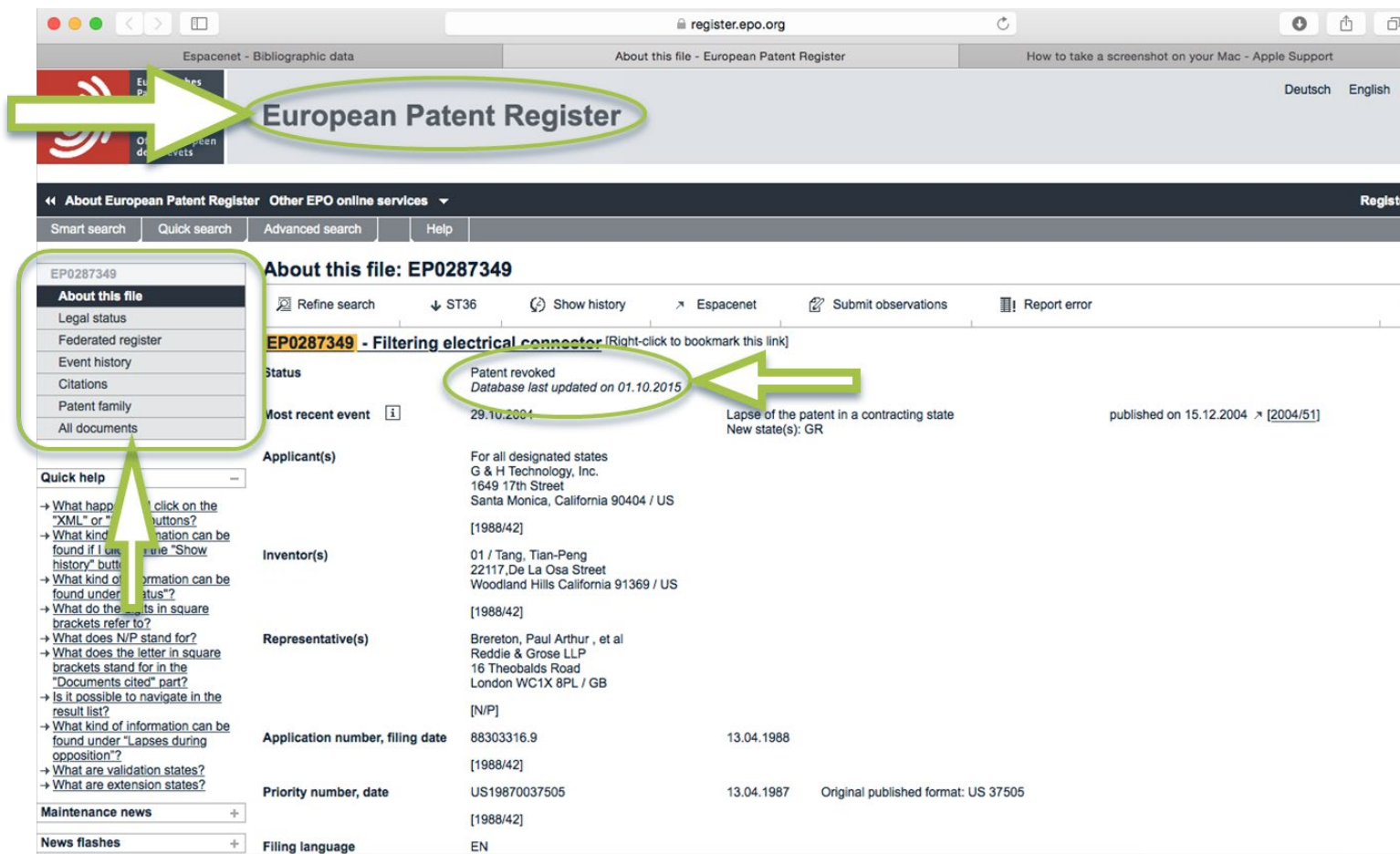
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EP0287349

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EP0287349 - Filtering electrical connector [Right-click to bookmark this link]

Status Patent revoked Database last updated on 01.10.2015

Most recent event 29.10.2004 Lapse of the patent in a contracting state New state(s): GR published on 15.12.2004 [2004/51]

Applicant(s) For all designated states G & H Technology, Inc. 1649 17th Street Santa Monica, California 90404 / US [1988/42]

Inventor(s) 01 / Tang, Tian-Peng 22117, De La Osa Street Woodland Hills California 91369 / US [1988/42]

Representative(s) Brereton, Paul Arthur, et al Reddie & Grose LLP 16 Theobalds Road London WC1X 8PL / GB [N/P]

Application number, filing date 88303316.9 13.04.1988 [1988/42]

Priority number, date US19870037505 13.04.1987 Original published format: US 37505 [1988/42]

Filing language EN

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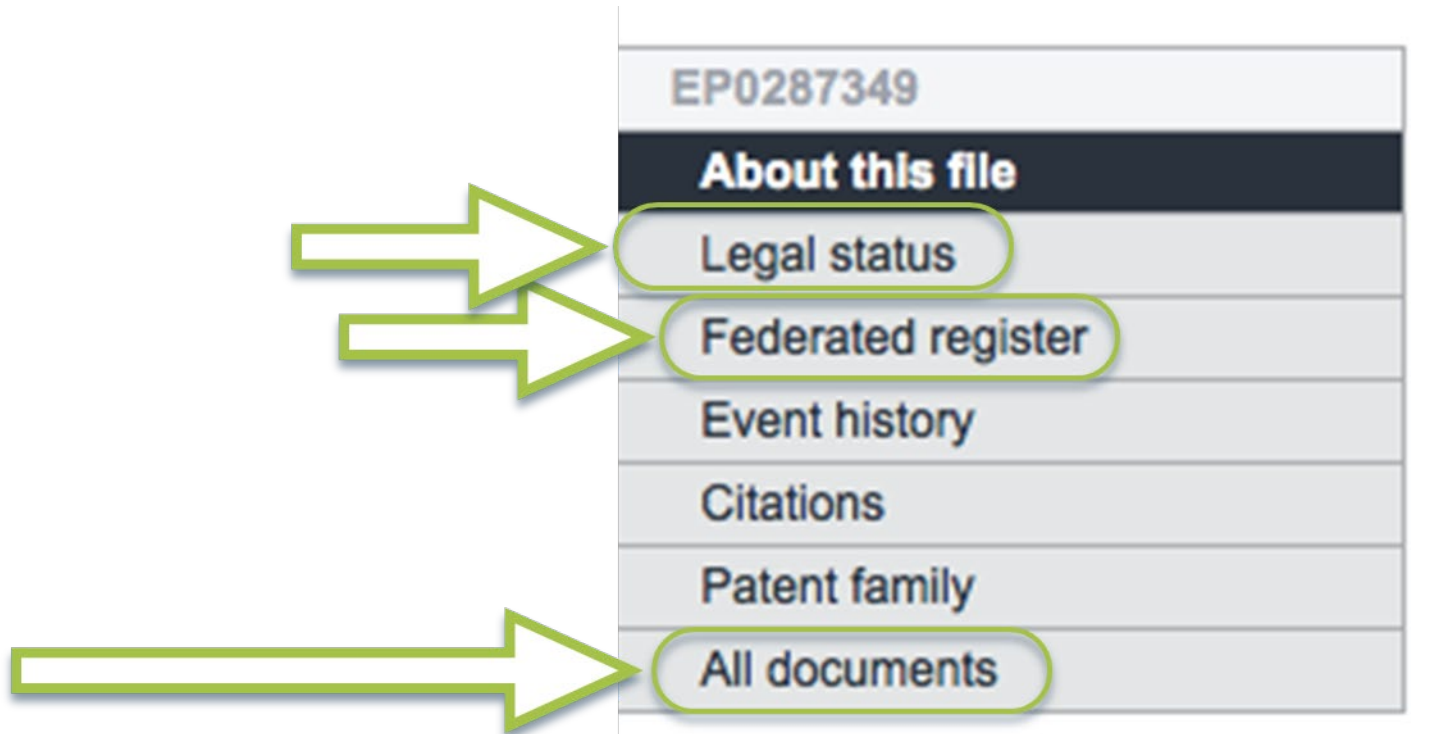
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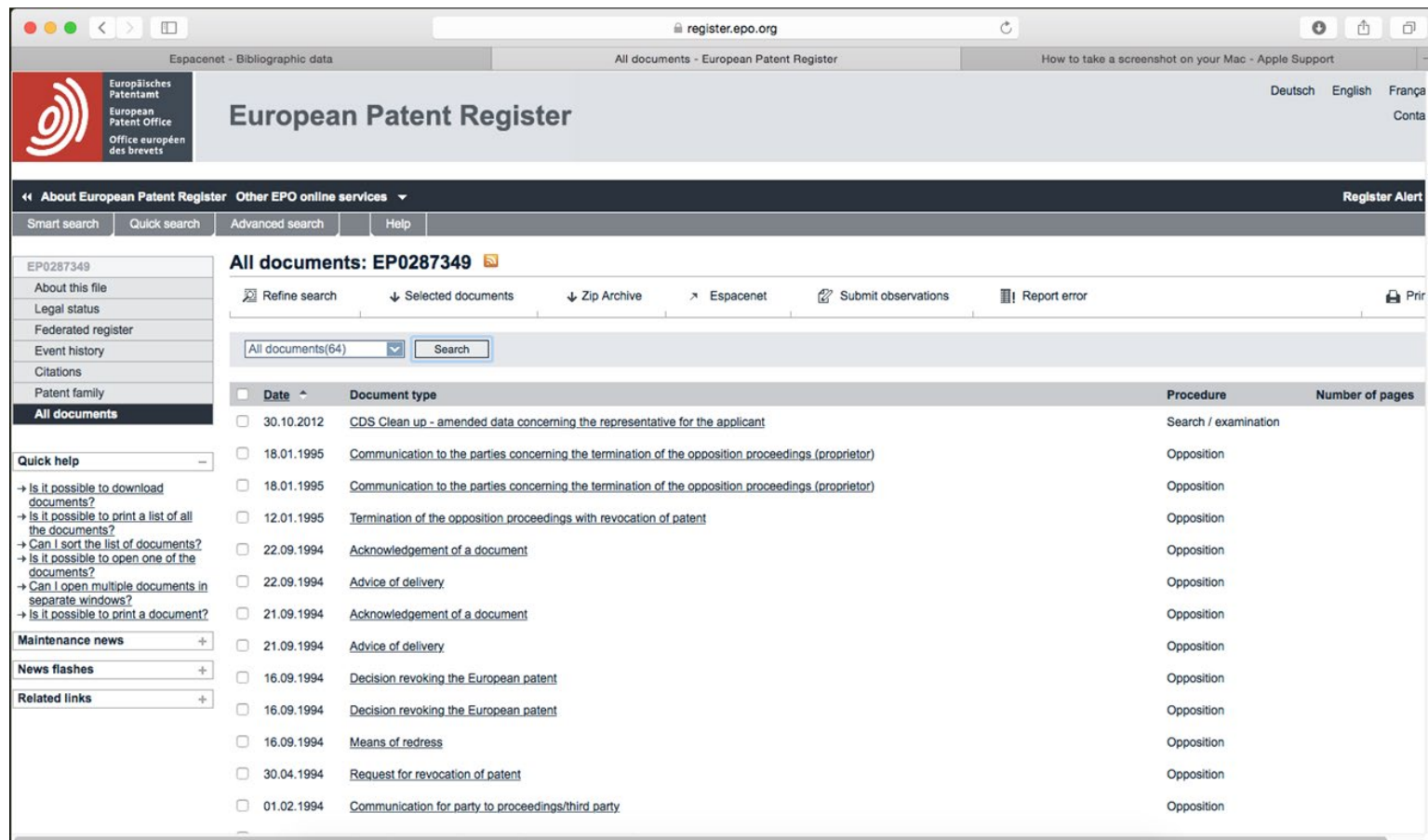
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Date	Document type	Procedure	Number of pages
30.10.2012	CDS Clean up - amended data concerning the representative for the applicant	Search / examination	
18.01.1995	Communication to the parties concerning the termination of the opposition proceedings (proprietor)	Opposition	
18.01.1995	Communication to the parties concerning the termination of the opposition proceedings (proprietor)	Opposition	
12.01.1995	Termination of the opposition proceedings with revocation of patent	Opposition	
22.09.1994	Acknowledgement of a document	Opposition	
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21.09.1994	Acknowledgement of a document	Opposition	
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30.04.1994	Request for revocation of patent	Opposition	
01.02.1994	Communication for party to proceedings/third party	Opposition	

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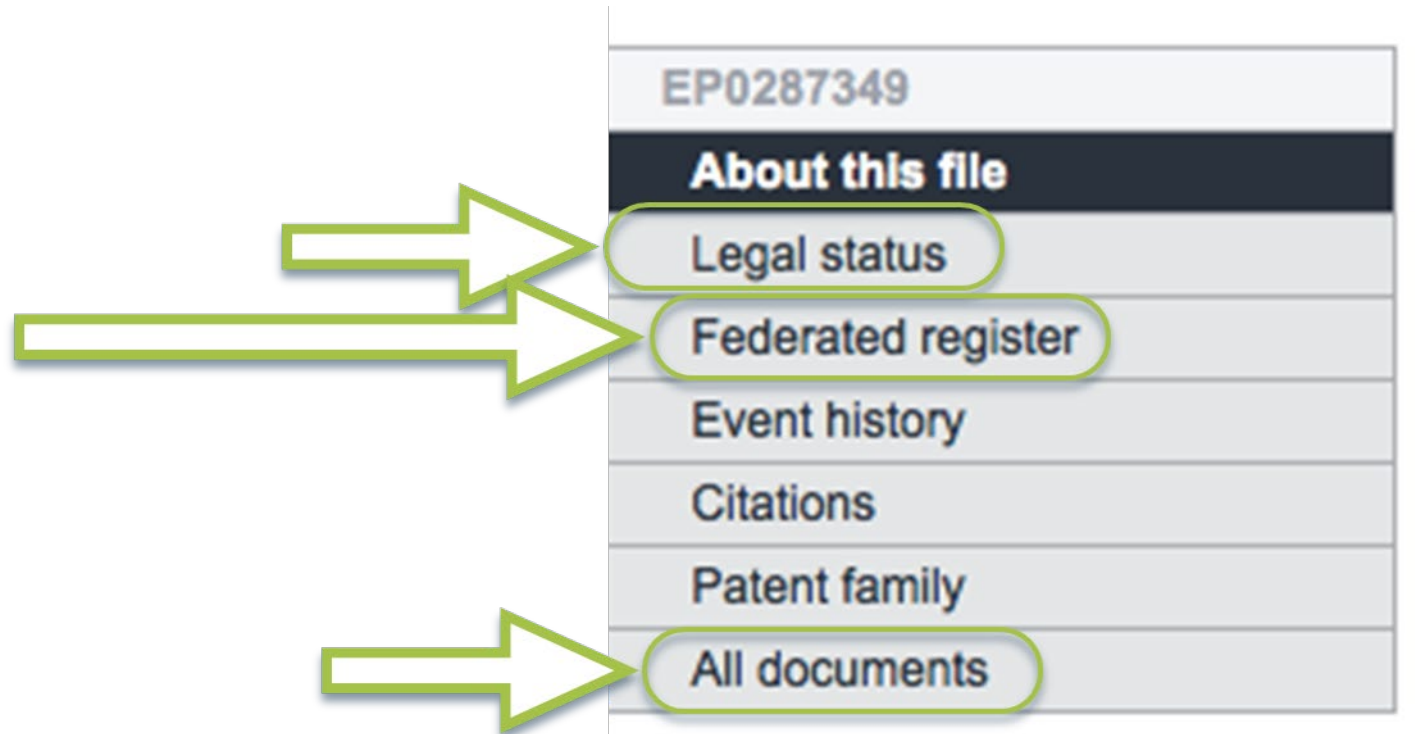
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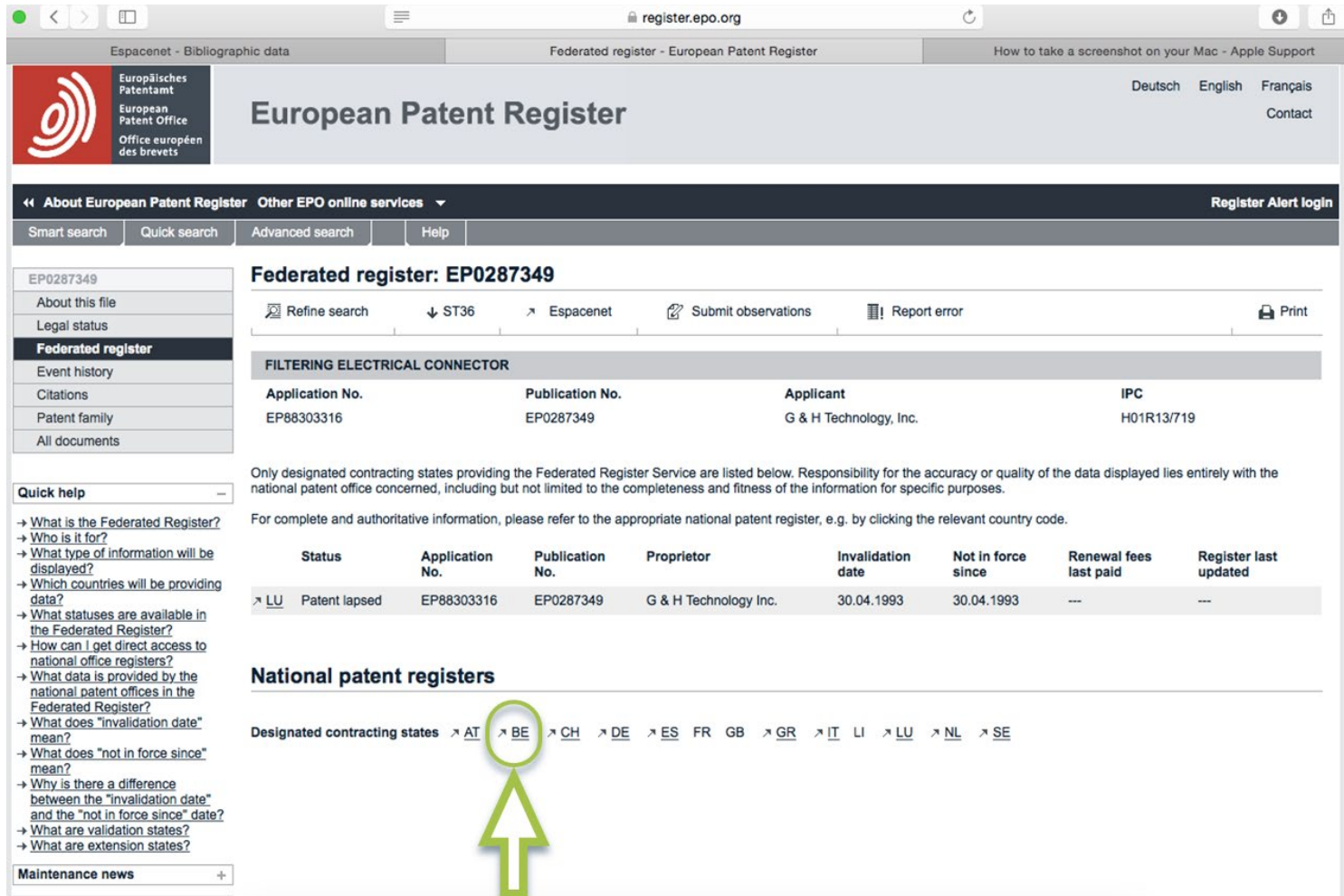
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**FILTERING ELECTRICAL CONNECTOR**

Application No.	Publication No.	Applicant	IPC
EP88303316	EP0287349	G & H Technology, Inc.	H01R13/719

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Status	Application No.	Publication No.	Proprietor	Invalidation date	Not in force since	Renewal fees last paid	Register last updated
LU Patent lapsed	EP88303316	EP0287349	G & H Technology Inc.	30.04.1993	30.04.1993	---	---

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**287349 Titre: Connecteur électrique à filtre.**

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Numéro de la demande:	883033169	Numéro de publication:	287349
Type:	Brevet européen délivré pour BE	Langue de publication de l'OE: B:	Anglais

**Dates**

Date de dépôt:	13/04/1988	Date de publication EP B1:	12/08/1992
Date de délivrance:	12/08/1992		

**Demandeur**

Nom:	G & H Technology, Inc.	Adresse:	1649 17th Street Santa Monica California 90404(US), US
De:	12/08/1992		

**Priorité**

Numéro de brevet prioritaire:	37505	Pays de priorité:	États-Unis (US)
Date de priorité:	13/04/1987		

**Classification**

Classification IPC ou IDT:	H01R 13/719;
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# Strategy

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# National patents

National application filed Country by Country  
at the respective Intellectual Property Offices.

Procedure up to grant -> see national provision

In general:

Filing->examination->grant



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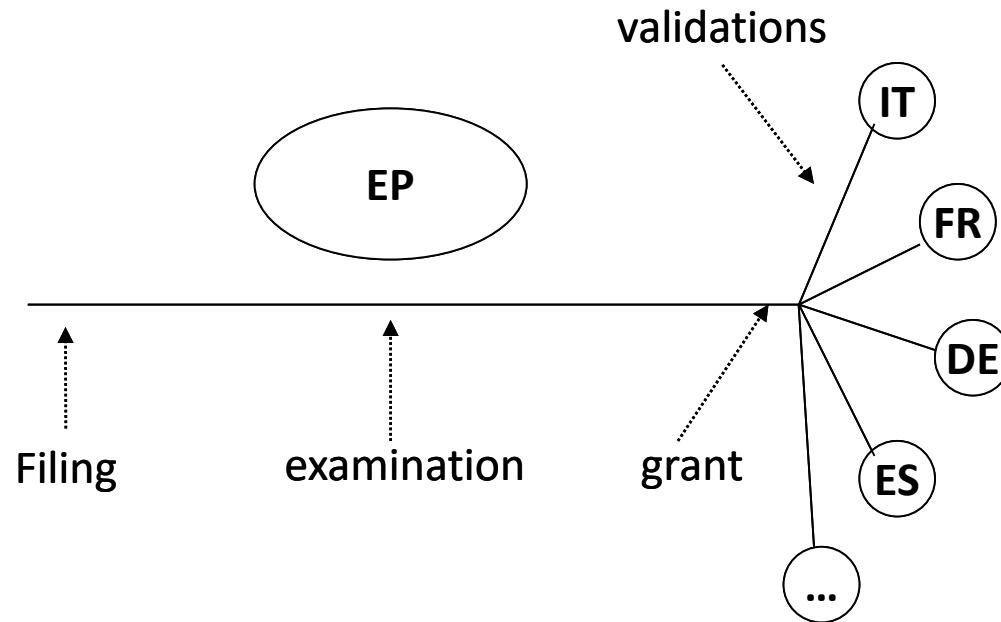
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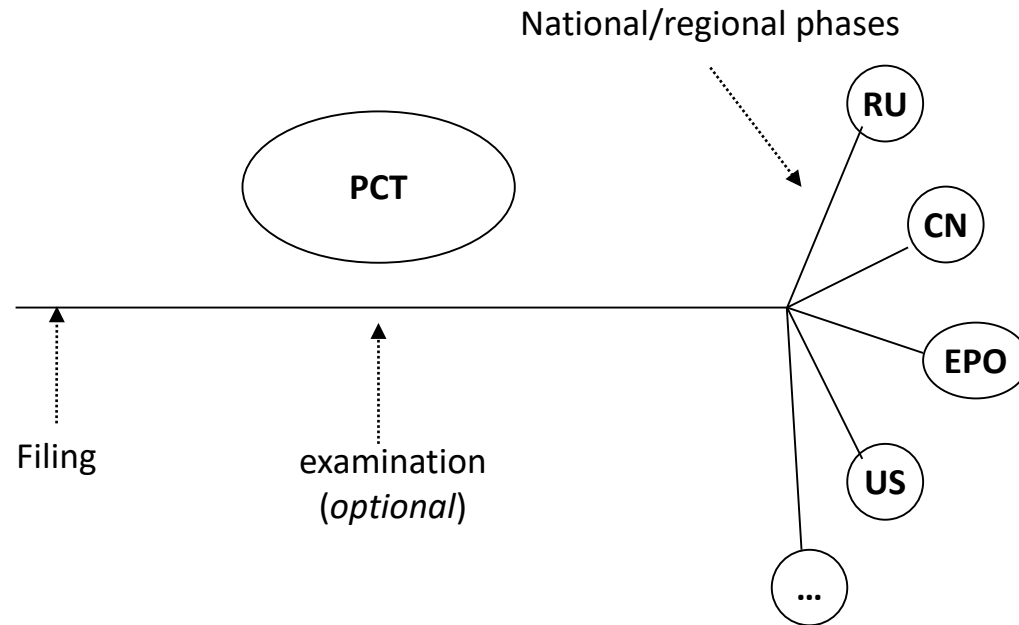
# EPO regional Phase

Filing -> examination -> grant -> validation



# PCT (patent cooperation treaty)

PCT duration: 30/31 months from EARLIEST filing  
(*between priority or filing date*)



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# Time is crucial!

Identifying a market should require time, how to take time is a matter of filing and extension strategy

General guiding principles:

- patent *choices* became less and less in time
- costs are (more or less) certain
- future earnings are (normally) not certain

# Where to file?

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A patent is the <u>right to exclude</u> from:	-> <i>where to file</i>
Production	file in <u>competitors production site</u> Countries
Put on the market, import, use	file where the <u>competitors</u> are where <u>clients</u> are in <i>potential</i> marketing Countries

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# Costs/benefit

- **Costs:**

Draft and first filing

Extension cost

Examination cost

Renewal cost

- **Benefit:**

*“monopoly”*

product added value

Company value

intangible asset of the company

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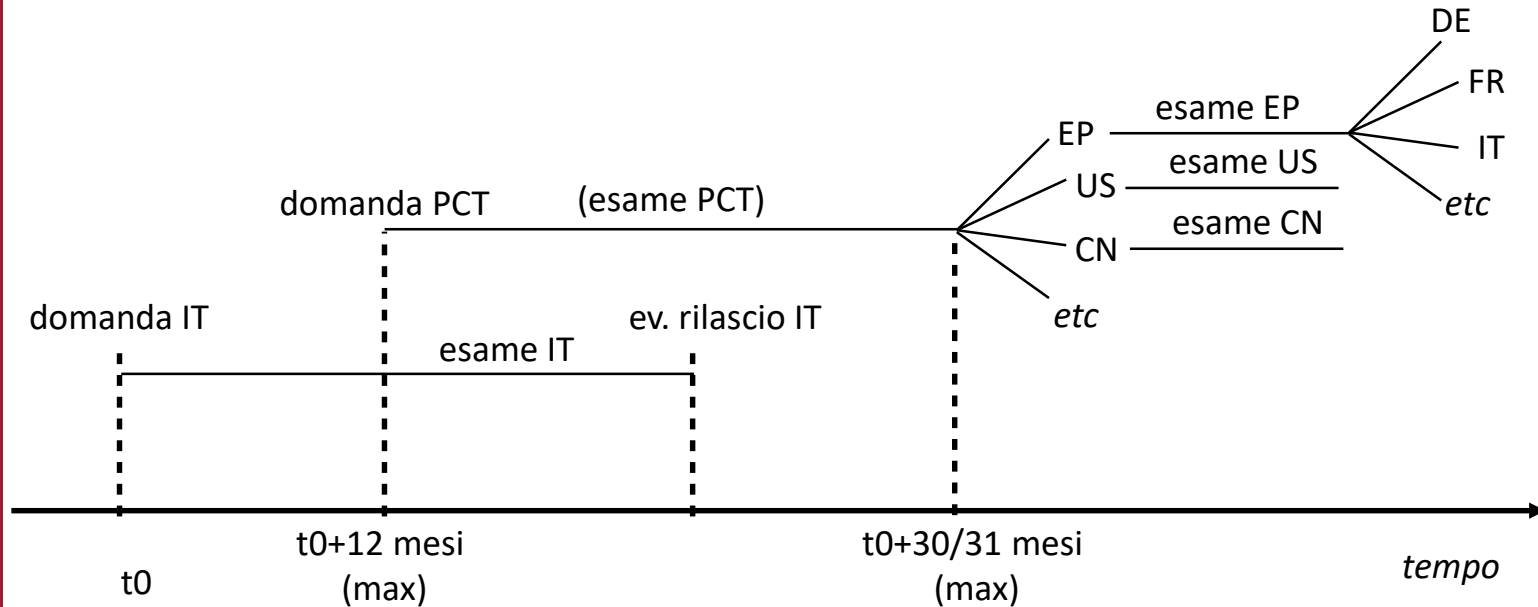
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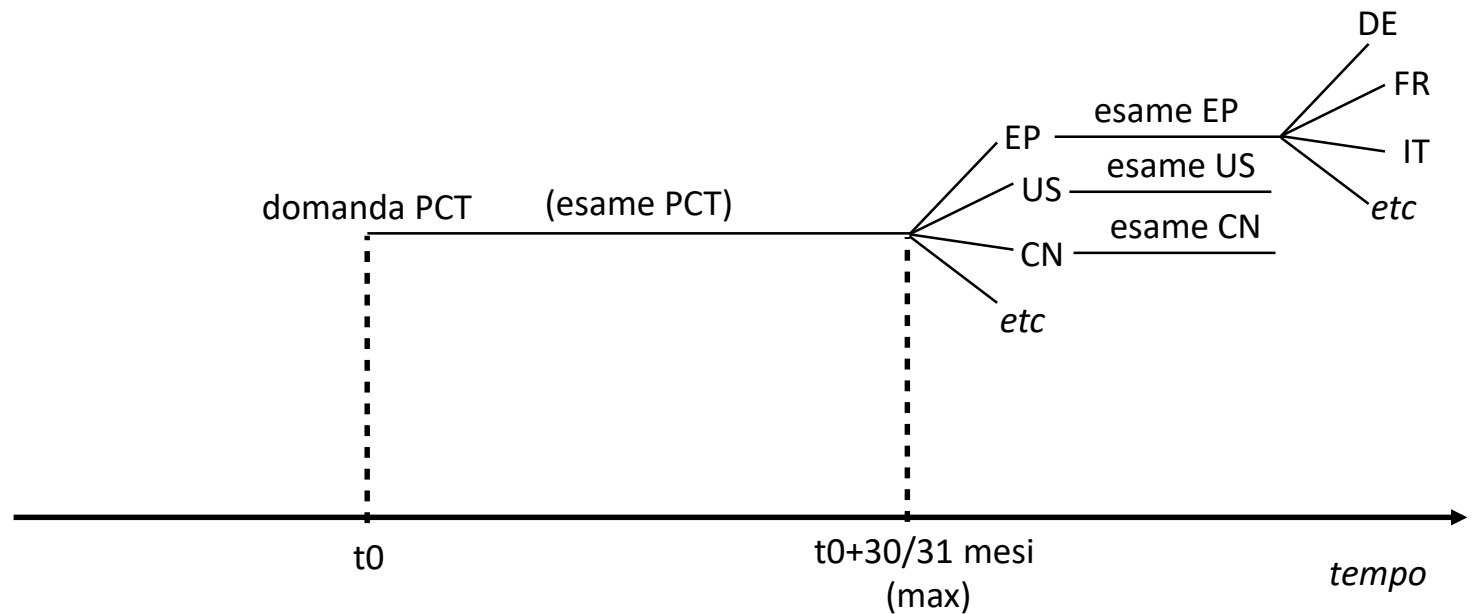
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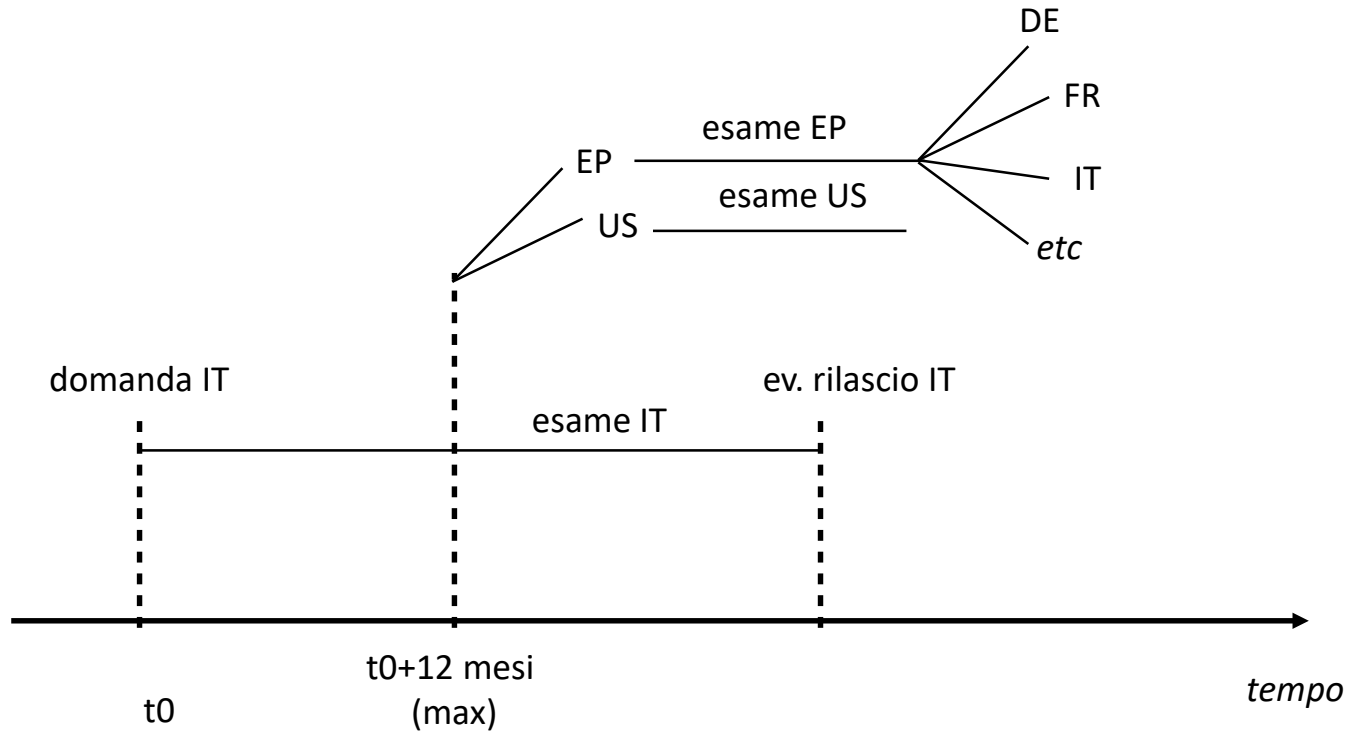
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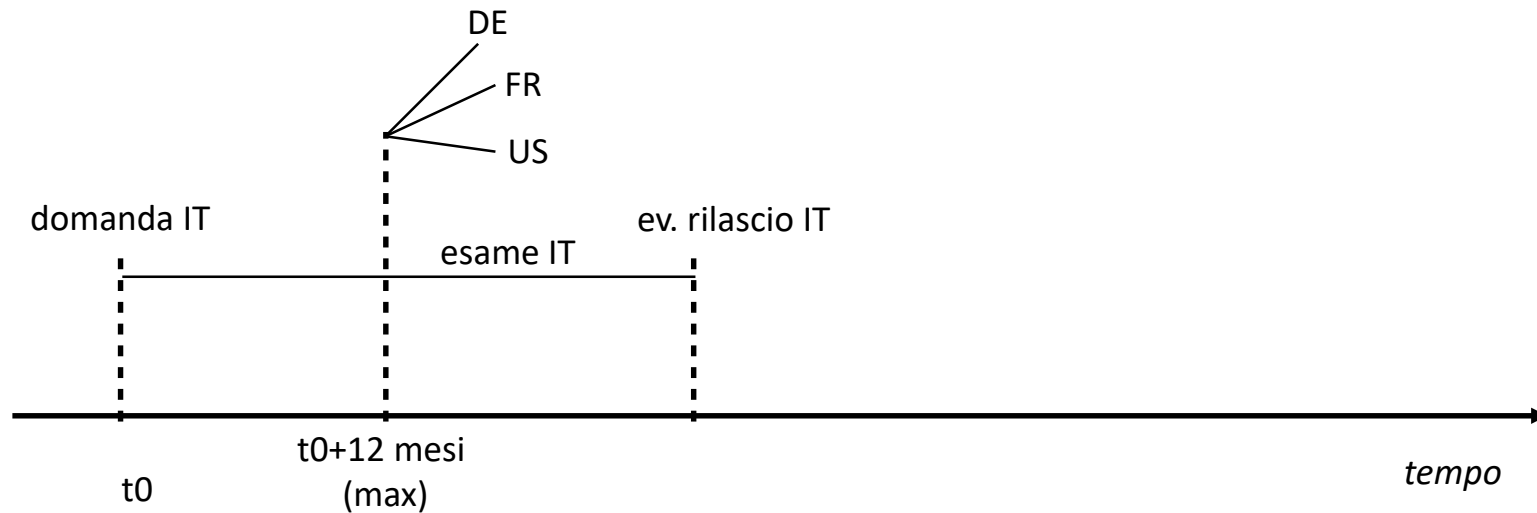
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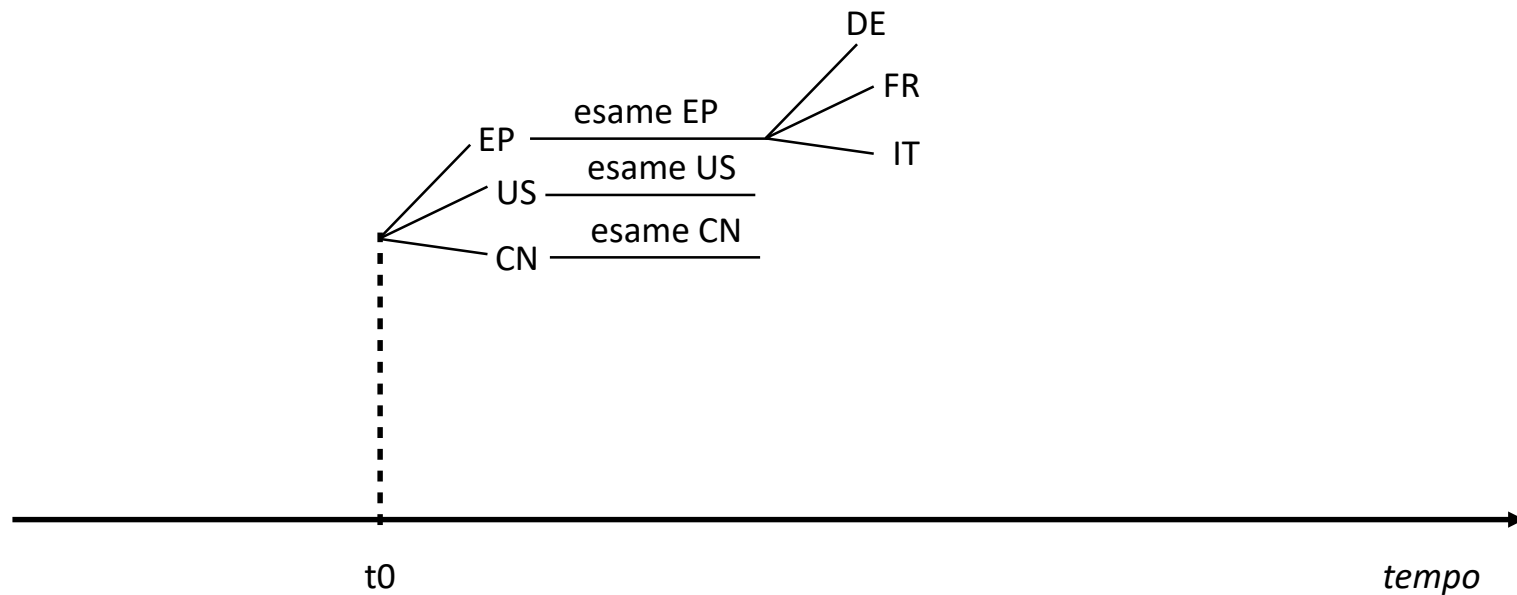
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# *Understanding a patent scope of protection*

## Guidelines for Examination in the EPO

The claims must be drafted in terms of the "**technical features** of the invention".

This means that claims should not contain any statements relating, for example, to commercial advantages or other non-technical matters, but statements of purpose should be allowed if they assist in defining the invention.

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FIRST PART (or pre-characterizing portion)

***characterized in that (or “wherein”)***

SECOND PART (or characterizing portion)

The ***first part*** should contain a statement indicating "the designation of the subject-matter of the invention" i.e.the general technical class of apparatus, process, etc. to which the invention relates, followed by a statement of "those technical features which are necessary for the definition of the claimed subject-matter but which, in combination, are ***part of the prior art***".

The ***second part*** or "characterizing portion" should ***state the features which the invention adds to the prior art***, i.e. the technical features for which, in combination with the features stated in the first part protection is sought.

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## ESEMPIO

1. Washing machine, such as a laundry washing machine, a washing/drying machine or the like, comprising a tub (1) housing a drum (2) into which the laundry to be washed is loaded, the machine being equipped with at least one tank (3,3') for a washing agent, and at least one supply duct (6,6', 8, 8') being afferent to said tank for delivering the washing agent into the tub (1),

### ***characterized in that it***

also comprises a hydraulic washing circuit (5,5', 12,12A,12A', 14,14') for flooding and draining the tank (3,3') for cleaning purposes.

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# *basics of claim drafting*

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***esercizio***



Prior art



invention