CPC field-specific training

F03H: Plasma thrusters
Agenda

- Introduction – Definitions
- F03H1 Scheme
- Examples
- Neighbouring fields
- Conclusion
Introduction – Definitions

**F03H** PRODUCING A REACTIVE PROPULSIVE THRUST, NOT OTHERWISE PROVIDED FOR

- **F03H1/00**
  Using plasma to produce a reactive propulsive thrust
  - Definition statement – This place covers:
  - Engines exhausting ions or a plasma (ions and electrons) to produce a reactive propulsive thrust; Details thereof.

- **F03H3/00**
  Use of photons to produce a reactive propulsive thrust

- **F03H99/00**
  Subject matter not provided for in other groups of this subclass
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# F03H1 Scheme: IPC vs. CPC

<table>
<thead>
<tr>
<th>IPC</th>
<th>CPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 main group</td>
<td>1 main group &amp; 15 sub-groups</td>
</tr>
<tr>
<td>classified by all patent offices</td>
<td>classified by EPO classifiers (now also by other CPC offices)</td>
</tr>
</tbody>
</table>

- 49% of documents classified in IPC F03H1 are classified in CPC
F03H1 Scheme

F03H1/00 (IPC) Using plasma to produce a reactive propulsive thrust

- F03H1/0006 {Details applicable to different types of thrusters}
- F03H1/0037 {Electrostatic ion thrusters}
- F03H1/0081 {Electromagnetic plasma thrusters}
- F03H1/0087 {Electro-dynamic thrusters, pulsed plasma thrusters}
- F03H1/0093 {Electro-thermal plasma thrusters}
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Examples
Gridded electrostatic thrusters

► F03H1/0043 \{characterised by the acceleration grid\}
Examples
Field Emission Electric Propulsion [FEEP]

► F03H1/005
Examples

Grid-less electrostatic (Hall-Effect Thruster)

► F03H1/0075
Examples

Grid-less electrostatic (end-Hall)

► F03H1/0068
Examples

Grid-less electrostatic (other than Hall-effect)

► F03H1/0062

F03H1/0062 . . {grid-less with an applied magnetic field}
F03H1/0068 . . . {end-Hall type}
F03H1/0075 . . . {Hall-effect thrusters with closed electron drift}
Examples

Electro-thermal plasma thrusters

► F03H1/0093
Examples

Electromagnetic thrusters

Electromagnetic: MHD engine

- Propellant tank
- Electric power supply
- Pump
- Positive electrode
- Magnetic field coils
- Cathode
- Electric current
- Accelerating plasma
- Arc
- Negative electrode
- Anode
- Electromagnetic force (J x B)

F03H1/0081
Examples
Pulsed plasma thrusters

► F03H1/0087
Examples

F03H99/00: thrusters "not otherwise provided for"
Example: **US 2016/0047364 A1**

Controlling trigger pulse generation in a pulsed plasma thruster

Allocate both **F03H1/0018** and **F03H1/0087**
Agenda

▪ Introduction – Definitions
▪ F03H1 Scheme
▪ Examples
▪ Neighbouring fields
▪ Conclusion
Neighbouring technical fields

- Cosmonautic vehicles (B64G1)
  - Arcjets, resistojets: B64G1/406
  - Adaptations of ion or plasma engines: B64G1/405

- Ion beam tubes (H01J27)

- Generating or accelerating plasma (H05H1)

**Relationships with other classification places**

- Multi-purpose ion sources which can be used inter alia as ion thruster should be classified only in H01J 27/00 and lower.
Neighbouring technical fields

BUT:
if there is a peculiar aspect
concerning an ion or plasma thruster,
then BOTH codes must be allocated
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Supplementary information

- **CPC Scheme, Definitions, Training material**
  www.cpcinfo.org

- **Search CPC by symbol or keyword**
  worldwide.espacenet.com/classification?

- **Guide to the IPC**

- **Guide to the CPC**
  www.cooperativepatentclassification.org/publications/GuideToTheCPC.pdf
Conclusion

*Always keep in mind when classifying*:

The purpose of classification is to **retrieve easily and quickly documents** according to their technical teaching.