Search matters 2019
The Problem-Solution-Approach: a powerful search tool

Welcome

- Dr Anne-Cécile Derrien (Fr)
  - At the EPO since Nov. 2005
  - Field A61L (Biomaterials)
  - Coach, Gerant

- aderrien@epo.org
What about you?

- Your background
- Your expectations
- How do you search?

Inventive step

Article 52 EPC

Technical problem

Article 56 EPC

Closest prior art

Skilled man in the art

Refocus the search

Not obvious?
Programme

- Warming Up
  - A brief history of inventive step
  - Inventive Step at the EPO:
    - the law
    - the problem and solution approach
  - How does it work in practise – Case I
- Inventive Step during the Search
- Case II
- Case III

Warming Up

- What is a patent?
- What is an invention?
- When is something inventive?

12 steps

How about 15?
Programme

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  - the problem and solution approach
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- Case II
- Case III

A brief history of inventive step (1)

Venice, 1474

There are in this city, and because of its grandeur and virtue there came to us from other places, men of great genius, apt to invent and discover a variety of ingenious devices. And if we provided that the works and devices discovered by such persons could not be imitated by others who may see them, stealing away the inventor’s honor, such men would exercise their genius and invent and make devices of no small utility and benefit to our commonwealth. Therefore, it is decreed by the authority of this Council that any person in this city who invents a novel and ingenious device, not made previously in our dominion, as soon as it is reduced to perfection, so that it can be used and exercised, shall give notice to the office of our Provisioners of Common (guild office). It being forbidden to all others in our land to make any other device which imitates and resembles the invention, without the consent and license of the author, for up to ten years. And, however, should anybody make it, the author and inventor will have the liberty to cite him before any office of the city, by which office the aforesaid who has infringed shall be forced to pay him the sum of one hundred ducats and the device immediately destroyed. Our government shall have the liberty, at its pleasure, to take and use for its needs any of such devices and instruments, but with this condition, that no others than the authors will be able to exercise them.

For: 116
Against: 10
Abstain: 3
A brief history of inventive step (2)

- Development of Inventive Step was step by step

- 1624 Britain: Statute of Monopolies required merely a "matter of new manufacture"

- Up to 1840, the only requirement for patentability was novelty and utility!

- End of 19th century non-obviousness present in US, German, British law

A brief history of inventive step (3)

Inventive step is a rather more subjective criterion, and it is also known as non-obviousness, or the fact of the invention not being obvious to a person with average skill in the field concerned.

Apart from being novel the invention must, in order to qualify for protection:
- have required a certain degree of ingenuity;
- reflect an element of creativeness;
- be more than just the result of daily experience or of knowledge per se.
A brief history of inventive step (4)

- What is a patent?

A patent may be considered as a contract.

The balance between disclosure and protection should be right.

Novelty is not enough ...

Programme

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Inventive step at the EPO

- The Law
- The EPC
  - Article 52(1) EPC
  - Article 56 EPC
- (Case Law)
- Guidelines – The Problem and Solution Approach

**Article 52 EPC**

**Patentable inventions**

European patents shall be granted for any inventions which are susceptible of **industrial application**, which are **new** and which involve an **inventive step**.
Article 56 EPC

An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art.

State of the art

Everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of an European patent application.

More than 100 Million Documents ... still growing everyday!

https://worldwide.espacenet.com/
Person skilled in the art

- A skilled person is an ordinary practitioner
  - in his technical field, he is
  - aware of what was common general knowledge in the art at
    the relevant date (T426/88, T4/98)
  - involved in the constant development of his technical field
    (T774/89, T917/95)
- He may be expected to look for suggestions in
  - neighbouring and general technical fields (T176/84, T195/84)
  - or even
  - in remote technical fields, if prompted to do so (T560/89)
- He may be a group of persons, e.g. research of production team
  (T164/92, T986/96)

Definition based on the decisions of the Board of Appeal

Non-obvious?
They are different: (number of bars, colour) and a second foot

Having only my known ladder, how would I change the lamp in my ceiling?
Obviousness: Having only my known ladder, how would I change the lamp in my ceiling?
The modification of the known ladder is not obvious:
the ladder is novel and inventive!

Pencil with rubber tip
**Discussion: How would you (do you) search?**

Inventive step during the search

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**Search table: pencil/rubber tip**

<table>
<thead>
<tr>
<th>Concept 1</th>
<th>Concept 2</th>
<th>Concept 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wooden pencil</strong></td>
<td><strong>Rubber tip</strong></td>
<td><strong>System</strong></td>
</tr>
<tr>
<td>Key words</td>
<td>key words</td>
<td>key words</td>
</tr>
<tr>
<td>writing device, pencil, ...</td>
<td>eraser, rubber tip, ...</td>
<td>writing + eraser, ...</td>
</tr>
<tr>
<td>CPC classification</td>
<td>CPC classification</td>
<td>CPC classification</td>
</tr>
<tr>
<td>B43K19/02</td>
<td>B43L19/0025</td>
<td>B43K29/02</td>
</tr>
</tbody>
</table>
### Concept 1: Wooden Pencil

- Pencil: X
- Rubber tip
- Bag: pencil + rubber tip: X

### Concept 2: Eraser

- Pencil: X
- Rubber tip: X
- Bag: pencil + rubber tip

### Concept 3: System Rubber Tip + Pencil

- Pencil
- Rubber tip
- Bag: pencil + rubber tip: X

- **same features**
- **differences**
- **...**
<table>
<thead>
<tr>
<th></th>
<th>Wooden pencil</th>
<th>Eraser</th>
<th>System rubber tip + pencil</th>
<th>Connective means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencil</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubber tip</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bag: pencil + rubber tip</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Difference: connective means**

Closest prior art

Obvious?

Application

Vote!
**Pencil with rubber tip**

US denied "trifling unimportant alterations were not patent worthy, they did not serve the common well being but harmed it"

Not easy to assess the degree of non-obviousness

- We need a method: the PSA
  

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**Consensus: New, industrially applicable, not obvious (Cf. EPC)**

But

**Criticism: degree of obviousness!**

- Every country had his own standard
  - scintilla of an invention
  - effort créateur ...
  - flash of inventive genius

- **EPO**
  Problem Solution Approach: EPO's standard to assess inventive step according to Article 56 EPC
Programme

- Warming Up
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  - the law
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How do we decide on obviousness?

- Various tests in different national systems.

- One of the tests used by the German office was that every invention is a solution to a technical problem.

- In the very first case heard by the Board of Appeal (T1/80) the problem and solution approach was used to determine the question of inventive step.
Not obvious

PSA: The problem and solution approach

One of the tests used by the German office was that every invention is a solution to a technical problem.

In the very first case heard by the Board of Appeal (T1/80) the problem and solution approach was used to determine the question of inventive step.

What is an invention?

At the EPO, one way of defining an invention is:

A non-obvious technical solution to a technical problem.
Inventive step during the search

- The examiner searches documents relevant for both novelty and inventive step.
- The inventive step search takes into account "the" problem.
- During the search usually closer documents are retrieved.
- Thus, the perception of the objective problem changes during a search.
- As a result, the examiner (re)focusses the search (thanks to the PSA).

PSA: Step 1

1. What is the closest prior art (CPA)?
   - What is the closest?
   - Why do we want to find the closest?

Most promising starting point for an obvious development leading to the invention, i.e.
- Similar purpose or effect
- Same or closely related technical field
(Cf. guidelines G.VII,5.1)

Pencil case: bag containing a pencil and an eraser
### PSA: Step 2

1. What is the **closest prior art** (CPA)?

2. What is the difference between the CPA and the claimed invention?

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**Pencil case:** *holding means (concept 4)*

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<table>
<thead>
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<th></th>
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<th>Eraser</th>
<th>System rubber tip + pencil</th>
<th>Connective means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencil</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubber tip</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Bag: pencil + rubber tip</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Difference:** connective means
PSA: Step 3

1. What is the closest prior art (CPA)?

2. What is the difference between the CPA and the claimed invention?

3. What technical effect is caused by the difference?

*Pencil case: attach the rubber tip to the pencil*

---

PSA: Step 4

1. What is the closest prior art (CPA)?

2. What is the difference between the CPA and the claimed invention?

3. What technical effect is caused by the difference?

4. The objective technical problem is to get the technical effect/an alternative

*Pencil case: provide 1 writing device with 2 functions: writing and erasing*
Search table: pencil/rubber tip

<table>
<thead>
<tr>
<th></th>
<th>Concept 1 Wooden pencil</th>
<th>Concept 2 Eraser</th>
<th>Concept 3 System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key words</td>
<td>writing device, pencil,</td>
<td>eraser, rubber tip, ...</td>
<td>writing + eraser, ...</td>
</tr>
<tr>
<td>classification /c, /ic, ...</td>
<td>B43K19/02</td>
<td>B43L19/00C</td>
<td>B43K29/02</td>
</tr>
<tr>
<td></td>
<td>B43L19/0056</td>
<td></td>
<td>B43K29/02</td>
</tr>
</tbody>
</table>

Document **US 1 373 062** retrieved after refocusing the search:

Not a wooden pencil but the holding means are present (concept 4).

All aspects of the invention are covered, no need for a further documents.
<table>
<thead>
<tr>
<th>Wooden pencil</th>
<th>Eraser</th>
<th>System rubber tip + pencil</th>
<th>Connective means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencil</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubber tip</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Bag: pencil + rubber tip</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pencil + eraser</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**B43K29/02 – systems combining an eraser and a writing device**

*Application*
PSA

1. What is the closest prior art (CPA)?

2. What is the difference between the CPA and the claimed invention?

3. What technical effect is caused by the difference?

4. What therefore is the objective technical problem?

5. Would the person skilled in the art solve it in the manner indicated on the basis of the totality of the prior art without at any stage employing any inventive skill?
Programme

- Warming Up
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The search

- Search table
- Search
- PSA
- Refocus
- Stop the search
The search

If your search is too narrow:
missing relevant documents

If your search is broad, you'll retrieve many documents but you can miss D3 (different technical field)

- * Search from general concepts and refocus the search: D2=CPA
- * Search for the problem (- - -)

All the most relevant prior arts have been found, covering all aspects of the invention: the search is complete

Case study
Case study

New sanitary systems to make your toilet a lovely place!

Claim 1: a sanitary device characterized in that it contains an aesthetic tank attached to private toilets.

Claim 2: The device according to claim 1 characterized in that it contains an aquarium and a toilet flush

Claim 3: The device according to claim 2 characterized in that the aquarium is included in the toilet flush

Search table: Fish tank flush

<table>
<thead>
<tr>
<th>Concept 1</th>
<th>Concept 2</th>
<th>Concept 3</th>
<th>Concept 4</th>
<th>Concept 5</th>
<th>Concept 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Toilet</td>
<td>Aesthetic</td>
<td>Tank</td>
<td>Attached</td>
<td>Aquarium</td>
</tr>
<tr>
<td>Keywords</td>
<td>toilets, flush, toilet tank, cittern, ...</td>
<td>attractive, aesthetic, pleasant, ...</td>
<td>vase, tank, reservoir, ...</td>
<td>linked, attached, within, connected, ...</td>
<td>aquarium, fish tank, fish container, ...</td>
</tr>
<tr>
<td>CPC</td>
<td>E03D1/00</td>
<td>A47G7/06</td>
<td>A01K63/003</td>
<td>E03C1, A47K11, A47K3, ...</td>
<td></td>
</tr>
</tbody>
</table>
## Search table: Fish tank flush

<table>
<thead>
<tr>
<th>Claim 3</th>
<th>Claim 2</th>
<th>Claim 1</th>
</tr>
</thead>
<tbody>
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<td>Concept 1</td>
<td>Concept 2</td>
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<td>Toilet</td>
<td>Aesthetic</td>
</tr>
<tr>
<td><strong>Key words</strong></td>
<td>toilets, flush, toilet tank, cittern, ...</td>
<td>attractive, aesthetic, pleasant, ...</td>
</tr>
<tr>
<td><strong>CPC</strong></td>
<td>E03D1/00</td>
<td>A47G7/06</td>
</tr>
</tbody>
</table>

## Fish tank flush

**Document D1**

<table>
<thead>
<tr>
<th>D1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Claim 1</strong></td>
</tr>
<tr>
<td>Toilet</td>
</tr>
<tr>
<td>(aesthetic)</td>
</tr>
<tr>
<td>tank</td>
</tr>
<tr>
<td>attached</td>
</tr>
<tr>
<td><strong>Claim 2</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Claim 3</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Fish tank flush

Document D1

Claim 1

Claim 2

Claim 3

Claim 1 not novel over D1: go for the features of claim 2
Claim 2 novel over D1: PSA

<table>
<thead>
<tr>
<th>Claim 2</th>
<th>Claim 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet</td>
<td>X</td>
</tr>
<tr>
<td>(aesthetic)</td>
<td>X</td>
</tr>
<tr>
<td>tank</td>
<td>X</td>
</tr>
<tr>
<td>attached</td>
<td>X</td>
</tr>
<tr>
<td>aquarium</td>
<td>–</td>
</tr>
<tr>
<td>(aquarium) integrated</td>
<td>–</td>
</tr>
</tbody>
</table>

Refocus the search:
PSA1 – CPA: D1
PSA2 – What is the difference with the CPA (Closest prior art)?

The tank is an aquarium

PSA3 – What is the effect?
Having fish related to your toilet system

PSA4 – What is the problem?
Enjoy watching fish in the toilet but preventing them to be flushed ...

Search for aquariums in combination with toilets.
In order to solve the same problem
### Search table: Fish tank flush

<table>
<thead>
<tr>
<th>Concept 1</th>
<th>Concept 2</th>
<th>Concept 3</th>
<th>Concept 4</th>
<th>Concept 5</th>
<th>Concept 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td>Toilet</td>
<td>Aesthetic</td>
<td>Tank</td>
<td>Attached</td>
<td>Aquarium</td>
</tr>
<tr>
<td><strong>Key words</strong></td>
<td>toilets, flush,</td>
<td>attractive,</td>
<td>vase, tank,</td>
<td>linked,</td>
<td>aquarium,</td>
</tr>
<tr>
<td></td>
<td>toilet tank, cittern, ...</td>
<td>aesthetic,</td>
<td>reservoir, ...</td>
<td>attached,</td>
<td>fish tank, fish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pleasant, ...</td>
<td></td>
<td>within,</td>
<td>container,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>connected,</td>
<td></td>
</tr>
<tr>
<td><strong>CPC</strong></td>
<td>E03D1/00</td>
<td>A47G7/06</td>
<td></td>
<td>A01K63/003</td>
<td>E03C1, A47K11,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A47K3 ...</td>
</tr>
</tbody>
</table>

### Fish tank flush

**Document D1**

<table>
<thead>
<tr>
<th>D1</th>
<th>D2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet</td>
<td>X</td>
</tr>
<tr>
<td>(aesthetic)</td>
<td>X</td>
</tr>
<tr>
<td>tank</td>
<td>X</td>
</tr>
<tr>
<td>attached</td>
<td>X</td>
</tr>
<tr>
<td>aquarium</td>
<td>~</td>
</tr>
<tr>
<td>(aquarium) integrated</td>
<td>~</td>
</tr>
</tbody>
</table>

**Document D2**
Fish tank flush

**Document D1**
- Claim 1 not novel over D1: go for the features of claim 2
- Claim 2 not novel over D2: go for the features of claim 3
- **Claim 3 novel over D1 and D2: PSA**

<table>
<thead>
<tr>
<th>Claim 3</th>
<th>D1</th>
<th>D2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet</td>
<td>X</td>
<td>X</td>
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<td>X</td>
</tr>
<tr>
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<td>–</td>
<td>X</td>
</tr>
<tr>
<td>(aquarium) integrated</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

**Document D2**
- **PSA1 – Closest prior art: D2**
- **PSA2 – What is the difference with the CPA (Closest prior art)?**
  - The aquarium is integrated within the toilet tank
- **PSA3 – What is the effect?**
  - We do not need a bigger room to put the aquarium and enjoy watching fish
- **PSA4 – What is the problem?**
  - To provide a toilet tank/ or sanitary device having an aquarium which does not require more space than a standard tank.

**No documents found in the field of toilets.**
- Search in the neighbouring fields for sanitary tanks which integrated aquarium, for integrated aquarium in general
### Search table: Fish tank flush

<table>
<thead>
<tr>
<th>Claim 3</th>
<th>Claim 2</th>
<th>Claim 1</th>
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<tbody>
<tr>
<td>Concept 1</td>
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<tr>
<td>CPC</td>
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<td>A47G7/06</td>
</tr>
</tbody>
</table>

### The search

- **Claim 1**: Toilet aesthetic tank attached. CPC: E03D1/00.
- **Claim 2**: Toilet aesthetic attached. CPC: A47G7/06.
- **Claim 3**: Toilet aesthetic attached aquarium. CPC: A01K63/003.
- **First PSA**: E03D1/00, **second PSA**: A47K3/02.
- **D1**:厕所美学水箱附带。
- **D2**:厕所美学附带水槽。
- **D3**:厕所美学整合水槽，但不是厕所。

**Invention**:厕所美学附带水槽。
**Document D2**
a fish tank for standard water tank, wherein the fish tank is added to the flush existing system.

**Document D3**
A47K3/02
a fish tank for standard water bath.

<table>
<thead>
<tr>
<th>Claim 3</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
</tr>
</thead>
<tbody>
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<td>Toilet</td>
<td>X</td>
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<td>X</td>
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<td>(aquarium) integrated</td>
<td>–</td>
<td>–</td>
<td>X</td>
</tr>
</tbody>
</table>

In view of D1, D2 and D3, claim 3 is novel but the problem (PSA-4) has been solved in a neighboring technical field (see D3).
**PSA 5:** Would the skilled person solve this problem in the manner indicated on the basis of the totality of the prior art, without at any stage employing any inventive skill?

**Case study**
Case study

Claim 1: a writing device comprising an eraser and an eraser holder, said eraser holder fixed to the head with metallic means.

Claim 2: The device according to claim 1 wherein the device is a wood pencil

Claim 3: The device according to claim 2 characterized in that the metallic holder adjustment means portions of said eraser are removable

Search table: The lasting eraser

<table>
<thead>
<tr>
<th>Claim 1</th>
<th>Claim 2</th>
<th>Claim 3</th>
</tr>
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<tbody>
<tr>
<td>Name</td>
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<td>metallic means</td>
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<td>pen, pencil, ...</td>
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<tr>
<td>wooden pencil</td>
<td>combined system</td>
<td>adaptable fixture</td>
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Search table: The lasting eraser

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Document D1: metallic pencil with an eraser

- writing device
- eraser
- metallic means
- system
- wooden pencil
- removable means
Document D1: metallic pencil with an eraser

Claim 1 not novel over D1: go for the features of claim 2
Claim 2 novel over D1: PSA

<table>
<thead>
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<th>Claim 3</th>
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<th>Claim 1</th>
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<tr>
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<tr>
<td>removable means</td>
<td>eraser</td>
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</table>

Refocus the search:
PSA1 – D1
PSA2 – What is the difference with the CPA?
The pencil is made of wood
PSA3 – What is the effect?
No effect is described.
PSA4 – What is the problem?
To provide a pencil made of an alternative material
PSA5 – Is claim 2 inventive?

Wooden pencils are well known thus we don't really need a document (but it is easy to quickly retrieve a document describing a wooden pencil)
Obvious modification: not inventive
## Search table: The lasting eraser

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</table>

## Document D1

### Claim 1
- writing device
- eraser
- metallic means
- system
- wooden pencil
- removable means

### Claim 2
- writing device
- eraser
- metallic means
- system

### Claim 3
- writing device
- eraser
- metallic means
- system
- wooden pencil
- removable means
Refocus the search:
PSA1 – D1 as closest prior art
PSA2 – What is the difference with the CPA? **removable metallic means**
PSA3 – What is the effect? **attached a longer eraser without it breaks and be able to use most of it.**
PSA4 – What is the problem?
**To provide a pencil having an eraser which can be used longer compared to the existing pencil (with eraser).**

Search for documents having a bigger eraser linked to a writing device, said eraser does not break and most of it can be used.
# Search table: The lasting eraser

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## The search

- **Problem to be solved**
- **Invention**
- **Adaptable eraser**
- **Wooden pencil**
- **Combined system**
- **Removable means**
- **Combined system**
- **Pencil waste**
- **Adaptable fixture**
- **B43K19/02**
- **B43L19/0056**
- **B43K29/02**
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In view of D1, D2 and D3, claim 3 is novel but the problem (PSA-4) has been solved in a neighbouring technical field (see D3).
PSA 5: Would the skilled person solve this problem in the manner indicated on the basis of the totality of the prior art, without at any stage employing any inventive skill?

Vote!

A patent is a non obvious solution to a technical problem