An Insider’s Guide to Understanding Patent

NUS Libraries
(Patent Resource Team)

Industry Liaison Office

5 March 2018
9am – 12noon
2pm – 5pm
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Programme Outline

• ILO Presentation
  – Introduction to Patents
  – Brief Overview of Patent Filing in NUS

• NUS Libraries Presentation
  – Patent Searching
    • How to Read a Patent Document
    • Patsnap (Basic Search)
    • Internet Sources

• Break
  – Patsnap Landscape & Patsnap Insights
INTRODUCTION & BRIEF OVERVIEW OF PATENT FILING IN NUS

Mr. Haujiun Chen
Manager
Industry Liaison Office
Outline

• **Intellectual Properties**
  – Overview
  – Alternatives besides patents

• **What to do?**
  – Things to know
  – Best time to approach ILO

• **Challenges**
  – Time commitment
  – Difficulties that researchers usually face
Outline

What is Intellectual Property?

“Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.”


- IP protected in law - patents (utility and design), copyright, IC layout design and trademarks
- Trade-secret, know-how
Overview

• WHAT PROTECTION PATENT OFFERS?
  – It does give you the right to exclude others from doing so.
  – During the time a patent is in place, a patent holder or licensee can exclude competitors from making and selling products similar to the patented idea of invention.
  – The inventor gives the public a full and complete disclosure of the invention with a teaching of how it works.

http://enterprise.nus.edu.sg/technology-commercialisation/for-researchers/about-patents
Overview

WHAT MAKES AN INVENTION PATENTABLE?

• **Novelty**
  – The invention must be new and original. An invention is not considered novel if it has been known, practiced, published, or disclosed by others anywhere in the world before the date the invention was filed by the applicant.

• **Utility**
  – The invention must be useful, i.e., it must have a practical application

• **Non-Obviousness**
  – The invention must not, at the time it was filed, be considered obvious to a person of “ordinary skill” in the field of the invention.

http://enterprise.nus.edu.sg/technology-commercialisation/for-researchers/about-patents
What to do? Challenges?

• **UNDERSTAND YOUR INVENTION**
  – Status of invention
  – Landscape
  – Learn to do search

• **UNDERSTAND WHY YOU ARE DOING YOUR SEARCH**
  – Scientific
  – Commercial - “White space”, defensive

• **SUBMITTING INVENTION DISCLOSURE FORM TO ILO**
  – Do your preliminary search
  – Discuss with ILO before submitting

• **PATENT PROSECUTION IS A LONG AND EXPENSIVE PROCESS**
  – Time commitment
  – Reasons to continue to maintain the patent
Patenting and Commercialization

- **WHERE TO GET INVENTION DISCLOSURE FORM?**
  - Please complete the document

- **PROVIDE AS MUCH INFORMATION AS POSSIBLE**
  - Funding sources
  - Inventors/collaborators
  - Publications or intended publication dates
  - Technical write-up of the invention
  - Leads and contacts to companies

- **DUE DILIGENCE**
  - Patentability
  - Commercial viability

- **COMMERCIALIZATION**
  - Marketing to companies
  - Licenses, research collaborations, spin-offs, etc.
Where to get it?

http://enterprise.nus.edu.sg/
Patent Journey

• **FILING PCT - WHY?**
  – Differing payment for filing national patents
  – Gestation period & Grooming start-up/spin-off Company
  – Time for additional research
  – Time to search for licensees/collaborators/investors
  – Time for marketing research

• **PATENT OFFICE ISSUES**
  – International Search Report (ISR) provides an indicator of the patentability of the patent application
  – Written Opinions (WO) provides detail opinion on cited references/prior art against patent application from Patent Office

• **AFTER PCT – NATIONAL PHASE ENTRY**
  – Entering into individually countries
  – Not the end – office actions, renewals fees, etc
Takeaway

• TYPES OF INTELLECTUAL PROPERTIES
• UNDERSTANDING YOUR INVENTION
• UNDERSTANDING WHY YOU ARE DOING YOUR SEARCH
• NUS IP PROCESS
  – OTHER TYPES OF INTELLECTUAL PROPERTIES
• PATENT PROSECUTION IS A LONG AND EXPENSIVE PROCESS
• LAB TO MARKET IS A MARATHON
9am – 12noon
Iftikhar Hayat
Lead, Engineering Resource Team
Member, Patent Resource Team, Scholarly Communication
NUS Libraries

2pm – 5pm
Loh Mee Lan
Patent Lead, Scholarly Communication Librarian
NUS Libraries

PATENT SEARCHING
Patent Searching - 5W1H

- 1- What
- 2- Why
- 3- When
- 4- Where
- 5- How
- 6- Who
What are you looking for?
OR
What is the purpose of searching patent?
OR
What do you want to achieve from this session?
Why search for patents? Is there a need?
Search: The benefits

Don’t search for patents as last part of the research process.

• To avoid duplicating research & infringement
• To investigate whether an invention is new and can be patented
• To use in business planning such as decisions on licensing, technology partnerships, mergers and acquisitions.
• To monitor the research activities of competitors
• To help identify and analyze filing trends
Search: Who needs patent information
NUS: Invention Disclosure Form Refer to ILO Website

**IV. DETAILS OF THE INVENTION**

16. **Overview** – Provide a summary or general description of the invention including its field of application:

... 

17. **Novelty & Unobviousness**¹⁰ – List the features of this invention that make it a substantial and significant improvement, or the case of new and unexpected results, over existing technology (i.e., methods, devices and/or materials). Indicate what are the unique benefits or advantages these features provide.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit/Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

18. **Limitations** – Describe the limitations, if any, of this invention in terms of, for instance, scalability, speed, power consumption, efficiency, use of exotic compounds, etc.

... 

19. **Prior Art** – List any other existing technologies or literature that more closely resemble the features and/or functionalities of this invention. Indicate how this invention differentiates from existing technologies or literature listed.

... 

20. **Commercial Applications** – List the critical commercial problems this invention solves:

...
When to search for Patents?
How does IP data from patents supercharge R&D?

“Patents fit at every stage of R&D, from **ideation to commercialisation**. Patents are an important source of technical information. Engineers should read patents during the innovation process to **understand R&D trends, emerging technologies and white spaces**. According to a survey by nature, 60% of all patent readers and 72% of those reading for scientific reasons reported that they found useful scientific information, in the most recent patent read in their field....”

“.... Patents are typically granted at a later stage of the R&D process but looking at patent literature should start at ideation. If you have an idea, it may be worthwhile checking whether a patented invention covers it. Looking at patent information **prevents** you from **duplicating effort**, and **equips you to improve your invention and build around an existing patent**.”

Where to search for Patents?
Search: Types of Patent Databases

Free online

- Lens
- Google Patents
- Etc....

NUSL subscribed

Country Specific

- USPTO
- IPOS
- Etc....

Different patent databases have different content and date coverage! Make sure you choose the appropriate one!

For more information, please refer to the patent libguide!

http://libguides.nus.edu.sg/patents
# Quick Comparison of 3 Patent Databases

<table>
<thead>
<tr>
<th></th>
<th>Patsnap</th>
<th>The Lens</th>
<th>Google Patents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coverage</strong> (information from their websites)</td>
<td>Over 125 million patent publications from over 25 patent offices + DocDB (covers nearly 100 jurisdictions)</td>
<td>Over 105 million patent publications from DocDB (covers nearly 100 jurisdictions), US, EP, WIPO PCT, Australia, etc.</td>
<td>Over 87 million patent publications from 17 patent offices</td>
</tr>
<tr>
<td><strong>Patent Analysis</strong></td>
<td>Yes. Overview: 6 options e.g. Application Trends, Top Assignee(s)</td>
<td>Yes. Display “Graphical Analysis”: 8 options e.g. Top 10 inventors</td>
<td>Yes. 3 options: (assignee, inventors, CPCs) e.g. top 5 assignees</td>
</tr>
<tr>
<td><strong>Use Semantic Search Option</strong></td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Landscape Analysis</strong></td>
<td>Yes</td>
<td>Yes (some features)</td>
<td>No</td>
</tr>
<tr>
<td><strong>Export Patent Documents to Citation Management Database</strong></td>
<td>No</td>
<td>Yes – Works with EndNote with some modification</td>
<td>No</td>
</tr>
</tbody>
</table>
## Quick Comparison of 3 Patent Databases

<table>
<thead>
<tr>
<th></th>
<th>Patsnap</th>
<th>The Lens</th>
<th>Google Patents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Patent Literature at Search</td>
<td>Separate subscription</td>
<td>Yes. Find journal articles cited in patents</td>
<td>Yes. Click on “Include non-patent literature (Google Scholar)” at beginning of search</td>
</tr>
<tr>
<td>Screen/Search Results Screen</td>
<td></td>
<td>Find patents using journal articles with DOI</td>
<td>[Include technical documents and books that are indexed in Google Scholar and Google Books]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Non Patent Literature (journal articles) at Individual Patent Document Screen</td>
<td>Listed.</td>
<td>Listed and searchable</td>
<td>Listed and clickable from “Similar Documents” Click “Find Prior Art” to find related patents and non patent literature</td>
</tr>
</tbody>
</table>
How to read a patent?
How to search for patents?
Exercise #1 (Known Patent):

- Title: Wireless pairing of earbuds and case
- Patent # US9769558
5- How to Read:

<table>
<thead>
<tr>
<th>Patents Libguide – Classification Codes, Country Codes, Kind Codes, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>United States Patent</strong></td>
</tr>
<tr>
<td>Chandramohan et al.</td>
</tr>
<tr>
<td>(12)</td>
</tr>
<tr>
<td><strong>Patent No.:</strong> US 9,769,558 B2</td>
</tr>
<tr>
<td><strong>Date of Patent:</strong> Sep. 19, 2017</td>
</tr>
<tr>
<td>(54)</td>
</tr>
<tr>
<td><strong>WIRELESS PAIRING OF EARBUDS AND CASE</strong></td>
</tr>
<tr>
<td>(71) Applicant: Apple Inc., Cupertino, CA (US)</td>
</tr>
<tr>
<td>(72) Inventors: Chandrachas Aralaguppe</td>
</tr>
<tr>
<td>Chandramohan, San Jose, CA (US);</td>
</tr>
<tr>
<td>Rico L. Zöckendorfer, San Francisco, CA (US);</td>
</tr>
<tr>
<td>Robert Doran Watson, Santa Clara, CA (US);</td>
</tr>
<tr>
<td>Patrick L. Coffman, San Francisco, CA (US);</td>
</tr>
<tr>
<td>Zachary C. Rich, Sunnyvale, CA (US);</td>
</tr>
<tr>
<td>Jason W. Brinsfield, Mountain View, CA (US)</td>
</tr>
<tr>
<td>(73) Assignee: Apple Inc., Cupertino, CA (US)</td>
</tr>
<tr>
<td>(74) Patent Libguide – Classification Codes, Country Codes, Kind Codes, etc.</td>
</tr>
<tr>
<td>( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.</td>
</tr>
<tr>
<td>(21) Appl. No.: 15/275,366</td>
</tr>
<tr>
<td>(22) Filed: Sep. 24, 2016</td>
</tr>
<tr>
<td>(65) Prior Publication Data</td>
</tr>
<tr>
<td>Related U.S. Application Data</td>
</tr>
<tr>
<td>(63) Continuation of application No. 15/273,685, filed on Sep. 22, 2016.</td>
</tr>
<tr>
<td>(Continued)</td>
</tr>
<tr>
<td>(51) Int. Cl.</td>
</tr>
<tr>
<td>G06F 1/00 (2006.01)</td>
</tr>
<tr>
<td>H04R 1/10 (2006.01)</td>
</tr>
<tr>
<td>(Continued)</td>
</tr>
<tr>
<td>(52) U.S. Cl.</td>
</tr>
<tr>
<td>CPC .......... H04R 1/041 (2013.01); A45C 11/00 (2013.01); A45C 11/24 (2013.01); A45C 13/02 (2013.01);</td>
</tr>
</tbody>
</table>

**ABSTRACT**

A case for a pair of wireless earbuds includes a lid and a lid sensor configured to generate a detect signal when the lid is moved from a closed position to an open position. The case further includes circuitry configured to, in response to receiving the detect signal, send a signal to the wireless earbuds to turn them on and to initiate a pairing sequence between the wireless earbuds and an electronic device.
What is claimed is:

1. A case for a pair of wireless earbuds having a wireless radio, the case comprising:
   a housing having a first cavity configured to receive a first earbud in the pair of wireless earbuds and a second cavity configured to receive a second earbud in the pair of wireless earbuds;
   a lid attached to the housing and operable in a closed position where the lid completely encloses the wireless earbuds within the case and a mechanism that allows a user to remove the pair of earbuds from the case;
   a connector configured to couple to each of the first and second earbuds, the connector including a conductor configured to couple to the first and second earbuds, the conductor configured to couple to the first and second earbuds being positioned in the first cavity and the conductor being positioned in the second cavity.

References Cited

U.S. PATENT DOCUMENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Date</th>
<th>Inventor</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,610,494 A</td>
<td>3/1997</td>
<td>Grosfilley</td>
</tr>
<tr>
<td>6,190,203 B1</td>
<td>2/2001</td>
<td>Murakami et al.</td>
</tr>
<tr>
<td>6,310,960 B1</td>
<td>10/2001</td>
<td>Passerini et al.</td>
</tr>
<tr>
<td>6,519,448 B1</td>
<td>2/2003</td>
<td>Dress et al.</td>
</tr>
<tr>
<td>6,658,124 B1</td>
<td>12/2003</td>
<td>Meadows</td>
</tr>
<tr>
<td>D529,288 S</td>
<td>10/2006</td>
<td>Ham</td>
</tr>
<tr>
<td>7,775,675 B2</td>
<td>8/2010</td>
<td>Hamm et al.</td>
</tr>
<tr>
<td>8,009,001 B1</td>
<td>8/2011</td>
<td>Cleveland et al.</td>
</tr>
<tr>
<td>8,009,002 B2</td>
<td>8/2011</td>
<td>Fiedler</td>
</tr>
<tr>
<td>8,126,177 B2</td>
<td>2/2012</td>
<td>Jensen et al.</td>
</tr>
<tr>
<td>8,170,623 B2</td>
<td>5/2012</td>
<td>Dorogusker et al.</td>
</tr>
<tr>
<td>8,180,093 B2</td>
<td>5/2012</td>
<td>Hankey et al.</td>
</tr>
<tr>
<td>8,181,233 B2</td>
<td>5/2012</td>
<td>Wyld</td>
</tr>
</tbody>
</table>

BACKGROUND

The described embodiments relate generally to portable listening devices such as earbuds and other types of headphones, and to cases for storing and charging such devices. Portable listening devices can be used with a wide variety of electronic devices such as portable media players, smart
5- How to search for patents?

**Known Patent Search**
- Patent No.
- Application No.
- Title
- Inventor Name
- Assignee Name

**Topic Search**
- Search by keywords identified

**Classification Search**
- US Classification (UPC)
- International Patent Classification (IPC)
- Cooperative Patent Classification (CPC)
- Locarno Classification
5- How to search for patents?

**Other Useful Tools:**

- **Patent Citations / Journal Articles Citations**
  - Retrieving patents found in journal articles
  - Retrieving journal articles found in patents

- **Semantic Search**

- **Patent Analysis**
  - Visualization Tools e.g. landscape maps
  - Information about the technology or companies
5- How

Login to Patsnap

http://www.lib.nus.edu.sg
5- How can I find similar patents?

**Search** for US8046721 (or any patent based on your topic)

- Patent Classifications
- Patent Citations
  - Citation Maps
### International Patent Classification (IPC)

<table>
<thead>
<tr>
<th>Scheme</th>
<th>RCL</th>
<th>Compilation</th>
<th>Catchwords</th>
<th>Corrigendum</th>
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<tbody>
<tr>
<td>A</td>
<td></td>
<td>SECTION A — HUMAN NECESSITIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>SECTION B — PERFORMING OPERATIONS; TRANSPORTING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>SECTION C — CHEMISTRY; METALLURGY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>SECTION D — TEXTILES; PAPER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>SECTION E — FIXED CONSTRUCTIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING</td>
<td></td>
<td></td>
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<tr>
<td>G</td>
<td></td>
<td>SECTION G — PHYSICS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>SECTION H — ELECTRICITY</td>
<td></td>
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</tr>
</tbody>
</table>

“It is a hierarchical classification system used primarily to classify and search patent documents (patent applications, specifications of granted patents, utility models, etc.) according to the technical fields they pertain. ... “

(http://www.wipo.int/classifications/ipc/en/faq/index.html)
5- How

Patent Classifications

5- How

View Citation map
## Basic Search: Topics

<table>
<thead>
<tr>
<th>Operators</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>AND</td>
<td>To combine different keywords/concepts</td>
</tr>
<tr>
<td>OR</td>
<td>To combine synonyms/alternative terms or similar keywords</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>Quotes for Phrases (more than one word)</td>
</tr>
<tr>
<td>*</td>
<td>Tr truncation to retrieve word variants.</td>
</tr>
</tbody>
</table>


Exercise #2 (Topic Search):

- Read the patent: Wireless pairing of earbuds and case & answer the following:
  - How do I know if this patent is an application or granted patent?
  - When is this patent granted? What is the date of grant?
  - When is this patent filed? Where is this patent filed? Is this patent also filed in other countries?
  - How can I find similar patents?
5- How

Information Search Process

- Identify Keywords
- Select Sources
- Construct Search Statement
- Satisfied with Results?

- 3d printing OR additive manufacturing
- Free Databases e.g. Lens, Google patents
- Country specific e.g. IPOS, USPTO
- Subscribed Databases e.g. Patsnap
- Narrow/broaden
- Advanced Search Techniques

- Set Alerts
- Access Full Text
5- How

To:

- Refine keywords
- Analyze
- Landscape
- Insights

Overview

Application Trend

Top IPC

Top Assignee(s)

Top Authorities

Top CPC

Patent Type

38,461 applications; 45,708 total

Copy query
5- How

To refine: Cited by count

Find : Highly Cited Patents
5- How

To Save:

Within A Document

Within A Search Set
To Saved Search, Set Alerts:

- Alert
- Saved Search

[Diagram showing navigation options: History, Workspace, Alert, Saved Search, My Analysis, Landscape, Name Grouping, Custom Fields, Account, Language, Logout]
5- How

To export:

1. Export Number
   - Selected patent records (20 patent(s))
   - From 1 to 500 (A total of 38,461 records)

2. Export Format
   - XLS
   - PDF
   - RTF
   - XML
   - CSV

3. Export Fields
   - Key Fields only
Exercise # 3
To kick start - You have 5 minutes

1. Select a Topic from above or Use your own topic.
   – Identify Keywords/ concepts

2. Go to NUS Libraries portal
   http://www.lib.nus.edu.sg

3. Login to Patsnap

4. Do a search
Other Useful Tools:

Patent Citations / Journal Articles Citations
- Retrieving patents found in journal articles
- Retrieving journal articles found in patents

Semantic Search

Patent Analysis
- Visualization Tools e.g. landscape maps
- Information about the technology or companies
5- How

Additional features - Lens.org (https://www.lens.org)

• It’s free!!
• Can also create login account
• Offers Keyword Search, Classification Search, etc.
• Finding journal articles in patent documents
• Finding patents using journal articles with DOIs
• Finding patents using ORCID
5- How

Additional features - Lens.org (https://www.lens.org/lens/)

Find Journal Articles Cited in patent documents
Additional features - Lens.org (https://www.lens.org/lens/)

Finding patents using journal articles with DOIs

Link to Full Text Article

DOI
https://doi.org/10.1002/jps.2600660104
5- How

The Lens: Find Patents That Cite Journal Articles With DOIs

1 Results for: citation_id:"10.1002/jps.2600660104"

Scholarly Works Citing Patents

Pharmaceutical salts.
Authors: SM Berge, LD Bighley, DC Monkhouse
Journal: Journal of pharmaceutical sciences, John Wiley and Sons Inc. Issue: 1, Volume: 66
Published: Jan 1, 1977
5,248 Patent citations 262 Scholarly citations (count from Crossref)
The Lens : ORCID

E.g. Dr Ge Yu, Julia (orcid.org/0000-0002-0861-2488)

Patent Results

<table>
<thead>
<tr>
<th>Patents</th>
<th>Cited Works</th>
</tr>
</thead>
</table>

6 Results for: citing_orcid_works:0000-0002-0861-2488

- Controlling Quality Of Service In Communications Networks
  - Published: Jul 3, 2008
  - Family: 2
  - Cited: 0
  - Applicant: France Telecom, Jain Menuka

- Controlling Quality Of Service In Communications Networks
  - Published: Jul 2, 2008
  - Family: 2
  - Cited: 7
  - Applicant: France Telecom


Add’l Info on ORCID: [ORCID @ NUS: About ORCID](https://library.nus.edu.sg/services/identifiers/orcid/)(Libguide)
Break Time
Patsnap Semantic Search

Another way to search in Patsnap:
Enter paragraph of text to describe the technology

Example: Copy the abstracts from this journal article to search
(http://dx.doi.org/10.1136/bjophthalmol-2013-304446)

Additional Info: Using Semantic Search in Patsnap
(http://www.lib.nus.edu.sg/ilp/pat/gui/Patsnap_Semantic_Search.pdf)
5- How

Patsnap Landscape

Data Visualisation
• May be easier to understand than looking at patent documents
• Based on the results that you have generated at that point
• Still need to check the patents to confirm if you are on the right track

Info on Patsnap Landscape Map:
https://www.youtube.com/watch?v=zTPVAWPGDSo
https://blog.patsnap.com/analysis-with-landscape-animations
5- How

Patsnap Insights

Business intelligence on companies and industries
Who is eligible to file patents?
Who to contact if you are searching for patents?
Who to contact if you are planning to file a patent?
Who grants patents?

Refer to: http://www.wipo.int/patents/en/faq_patents.html#accordion_collapse_10
References:

Patent Subject Guide:
- [http://libguides.nus.edu.sg/patents](http://libguides.nus.edu.sg/patents)
  - Patsnap Guides

Industry Liaison Office. Information for researchers
- [http://enterprise.nus.edu.sg/technology-commercialisation/for-researchers](http://enterprise.nus.edu.sg/technology-commercialisation/for-researchers)

Useful links:

Patent Databases:
- Patsnap
- Lens.org
- Google Patents
- USPTO
- IPOS

Other References
YOUR FEEDBACK IS GREATLY APPRECIATED

[Link]

For Queries on Patent:
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