# CS30A7381SS Systematic Creativity and TRIZ basics Online

Ho Nguyen Huy

Basic Creativity Methodologies Course - Center for Scientific and Technical Creativity (CSTC)



Online Course - Lappeenranta University of Technology (LUT)

Jan 2019





**LUT**Lappeenranta
University of Technology

# CONTENT

- 1. Introduction to my topic
- 2. Patents for my system
- 3. Function of my system
- 4. Function Oriented Search
- 5. Applying of Biomimetics to my system
- 6. Ideal Final Result for my system
- 7. Contradictions for my system
- 8. TESE for my system

# 1) Introduction to my topic

### GRASS (LEPIRONIA ARTICULATA) DRINKING STRAW



https://vi.wikipedia.org/wiki/C%E1%BB%8F\_b%C3%A0ng http://www.onghutco.com/

### PRODUCT SPECIFICATION



#### Product: Green grass straws

- Length of straw: 18 cm (or depending on the customer, not exceeding 22 cm).
- Size: inner diameter 4.5 6.5 mm
- Thickness: 0.5 0.8 mm
- End of straws is cut with a sharp knife.
- Straw interior: the inner velvet surface is clean.
- Material: grass, naturally grown grass (1-2 years old).
- Handcrafters: group of women residing in Đức Huệ, Long An province

#### **PRICING**

Fresh grass straws: 600đ/pcs order from 500pcs

### PRODUCT SPECIFICATION



#### Product: Dried grass straws

- Length of straw: 18 cm
- Size: inner diameter 4.5 6.5 mm
- Thickness: 0.5 0.8 mm
- End of straws is cut with a sharp knife.
- Straw interior: the inner velvet surface is clean.
- Material: grass, naturally grown grass (1-2 years old).
- Hand-crafters: group of women residing in Đức Huệ, Long An province Pricing:

Dry grass straws: 1,000đ/pcs order from 500pcs

### PRODUCT SPECIFICATION

#### **PRESERVATION**

Fresh straws can keep in refrigerator for 2 weeks. it's good when use in 1-3 days. It's can be store in room temperature (27-28°C) up to 5 days. Dried grass straws can be store in room temperature up to 6 months.

#### **USING:**

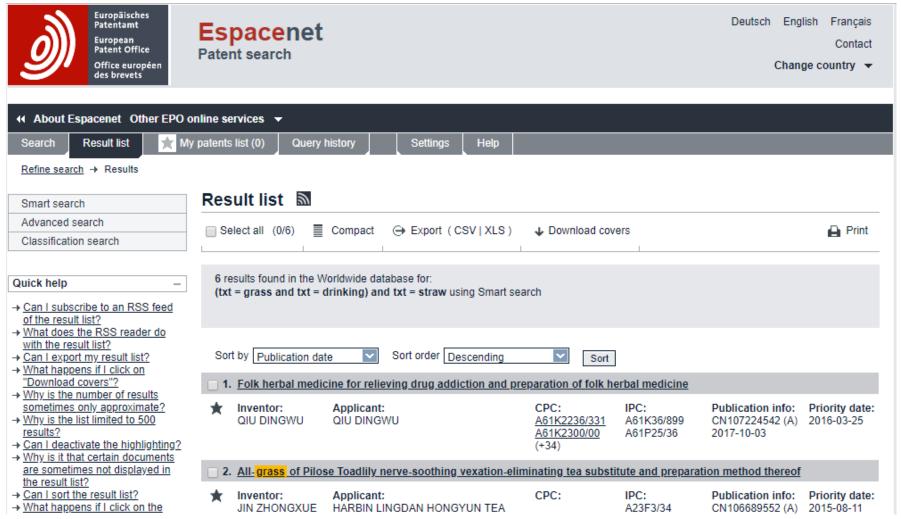
Soak in water, soap nut, salt water or even boiled in water before use.

AFTER USE: Put them in the compost bin, please.

# 2) Patents for my system

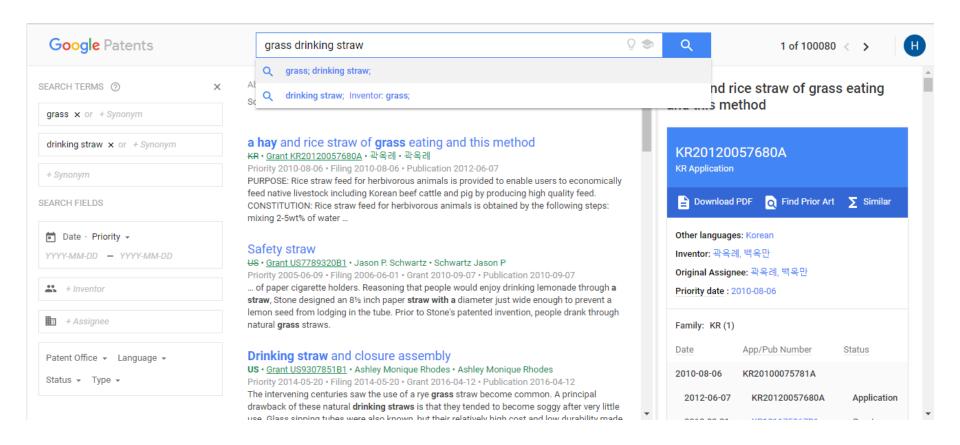
- 1/ Identify the keywords: Grass Drinking Straw
- 2/ Choose the database: Espacenet, Google Patent and my own country.
- 3/ Search

https://worldwide.espacenet.com/searchResults?ST=singleline&locale=en\_EP&submitted=true&DB=&query=grass+drinking+straw



The result is 6 but they are not suitable for my system
I tried to search with "grass drinking straw" and there is no result

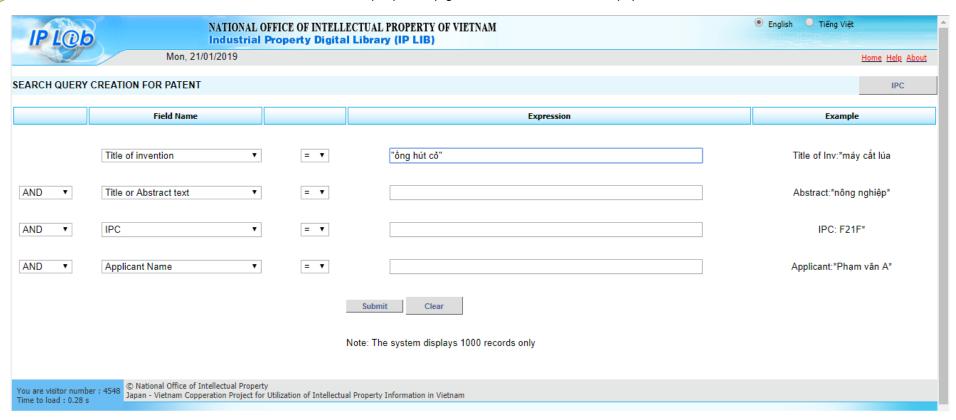
https://patents.google.com/patent/CN108498730A/en?q=drinking&q=grass&q=straw&oq=drinking+grass+straw



The result is 100080 but they are not suitable for my system. It is only find the result with separated word like grass, drinking, straw.

I tried to search with "grass drinking straw" and there is no result

#### http://iplib.noip.gov.vn/WebUI/WSearchPAT.php



There are no result.

# 3) Function of my system

- > The main function: transport liquid and light food.
- > For Grass Drinking Straw, it will have more functions like:
  - Reduce plastic straw
  - Increase environment-friendly products
- Grass Drinking Straw disadvantages: Easy to damage because its thin thickness

# 4) Function Oriented Search

1. Identify the key problem to be solved:

thin wall pipe; non-elastic material

2. Articulate the specific function to be performed:

become more rigidly

3. Formulate the required parameters:

thickness; flexibility

4. Generalize the function:

increase the thin wall and non-elastic material rigidity

5. Identify other technologies that perform a similar function in related and non-related industries:

production; material; transportation; preservation technologies

6. Select the technology that is most suitable to perform the desired function based on your requirements and constraints:

production; material technologies

7. Identify and solve the secondary problems required to adapt and implement the selected technology:

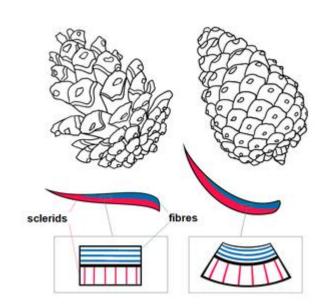
transportation; preservation technologies

# 5) Applying of Biomimetics to your system

When I see the Pine Cone. I have an idea:

The Straw will be rigid (solid, no hole) when it is dry (good for transportation; preservation). And will be soft (thin shell, have hole with the determined diameter) when drinking.

But there are the contraption: pine cones are self-opening when it is dry and closing otherwise.



https://www.youtube.com/watch?v=oI7kkFcMSKM

# 6) Ideal Final Result for my system

- 1) An ideal system is no system but the FUNCTION IS PERFORMED
- 2) Ideally, the product appears itself when it is necessary and where it is necessary

From the second sentence. I think the straw will be solid (no hole) when it does not use for strength increasing. And will have hole (thin shell) when it is used.

## 7) Contradictions for my system

We have the Physical Contradiction:

The straw must have hole (H) for drinking. And must have not hole (-H) for strength increasing

### I use Contradiction Solution Route: Separation in Space.

"WHERE the parameter has to have the property A and WHERE the property -A?"

### **And Inventive Principles Used To Tackle This:**

1. Segmentation

2. Taking out

3. Local Quality

17. Another Dimension

13. Other Way Around

14. Curvature

7. Nested Doll

30. Flexible Shells/Thin Films

4. Asymmetry

24. Intermediary

26. Copying

### I use Contradiction Solution Route: Separation in Time.

10 Prior Action

20. Continuity of Useful Action

"WHEN the parameter has to have the property A and WHEN the property -A?"

### **And Inventive Principles Used To Tackle This:**

15 Dynamics

9. Prior Counter-Action

13. Dynamics	10. I Hol Action
19. Periodic Action	11. Beforehand Cushioning
16. Partial or Excessive Action	21. Skipping
26. Copying	18. Mechanical Vibration
37. Thermal Expansion	34. Discarding & Recovering

### **IDEA**



#### After harvesting

After manufacturing, the Straw may be like this for transportation; preservation.





After delivery, the Straw should be kept solid for preservation and take out the internal part to become the thin shell part before give them to drinking people

The principles give me the idea: 2. Taking out; 3. Local Quality; 7.

Nested Doll; 24. Intermediary; 15. Dynamics; 10. Prior Action; 16.

Partial or Excessive Action

# 8) TESE for my system

#### 1/ S-Curve Trend

The ice straw. May be not good for long drinking time but the friendly-environment



### 2/ S-Curve Trend; Ideality Trend

The Edible straw. May be good for long drinking time (do not melt instant) and the friendly-environment



https://www.youtube.com/watch?v=sISzW2u-jyw

### 3/ Ideality Trend; Transition to the Super System Trend

May be like in space environment. There may be no Straw



https://www.youtube.com/watch?v=L9xdiDOeXvE