PROPOSAL FOR AN EFFICIENT INVENTION DEPLOYMENT METHOD BASED ON TRIZ (THEORY OF INVENTIVE PROBLEM SOLVING)

TRIZ SYMPOSIUM 2013

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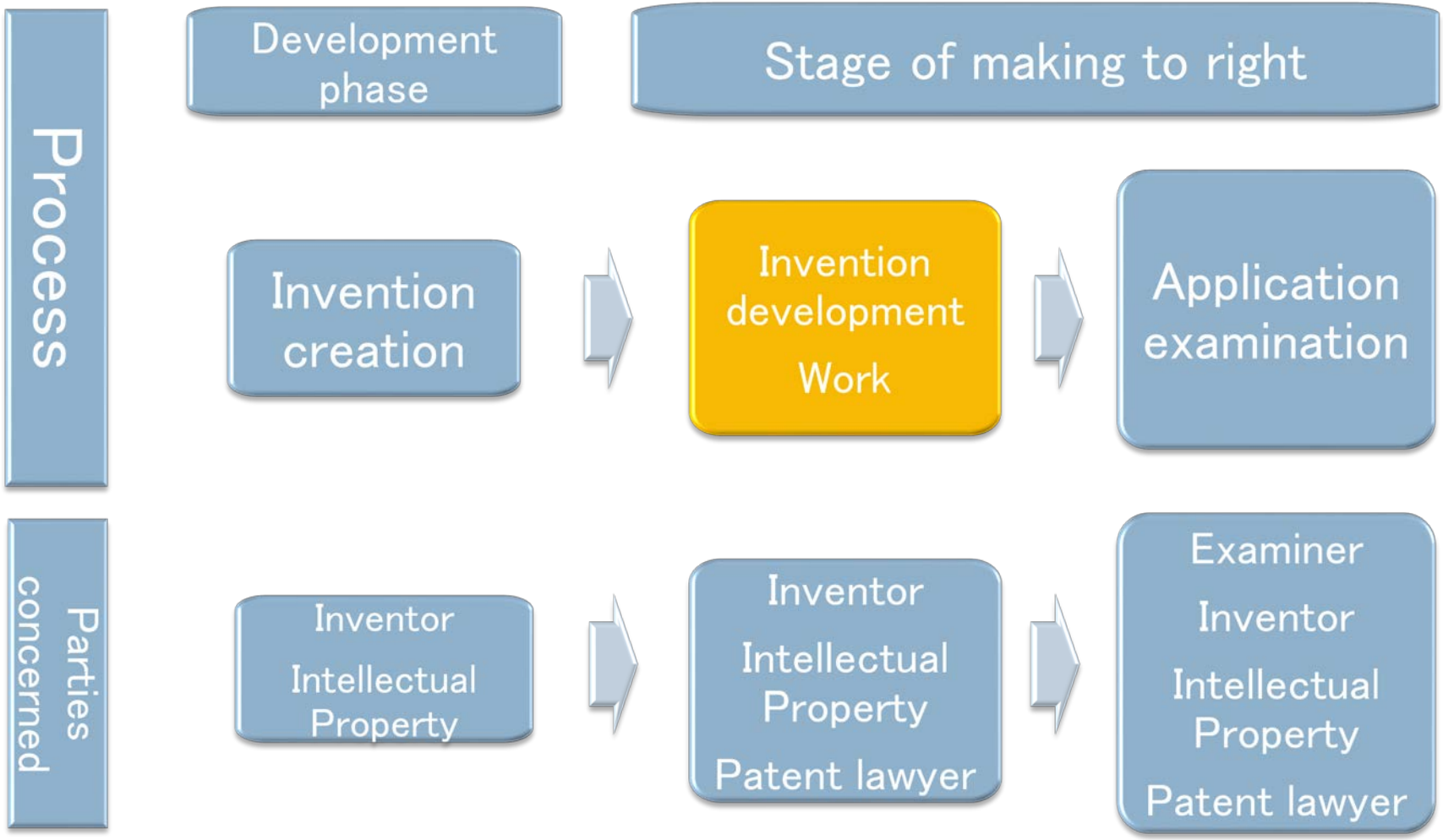
1. Investigative Purpose

What is an invention development work?



1. Investigative Purpose

Invention derived by invention development work?

High-ranking invention X

The outline: The first invention, the horizontal invention, and the subordinate position invention are included.

Example: Blower machine without blade

The enhancing meaning: It contributes to the technical range enhancing.

Development

The inventor's invention (the first invention)

Example : Fan without blade

Development

Develo pment

The horizontal invention

The outline: The common challenge is solved by a different means.

Example : Drier without blade

The enhancing meaning: It contributes on the patent inclination.

It contributes to the technical range enhancing.

⇒In the present study, it derives it as the first stage for the horizontal invention.

Subordinate position invention

The outline: The first invention is limited.

Example : Concrete shape of vent

The enhancing meaning: It contributes on the patent inclination.

1. Investigative Purpose

Technique and the problem in the past.

Purpose of invention development work

・A high-ranking invention, the horizontal invention, and the subordinate position invention are derived from the inventor's invention.

⇒A technical range of the invention is enhanced, and the patent of the invention is improved.

⇒The prior patenting of the cooperation other companies is evaded.

Technique in the past

・It executes it by the brainstorm (Brest) by parties concerned.

Problem of technique in the past

・General problem of Brest:

-Efficiency is low.

-It is not possible to slip out the stereotype.

1. Investigative Purpose

Solution rough draft of problem of technique in the past

Rough draft that solves problem of technique in the past

・Invention development work using TRIZ

Advantage of TRIZ

・Stereotype breaking down when technical idea is created

・Efficiency improvement of technical idea creation

Advantage forecast by using TRIZ

・Invention development work ⇒ stereotype breaking down + efficiency improvement

1. Investigative Purpose

Problem of TRIZ use

Difference of assumption

・The invention development work starts from the state of the invention creation ending.

・TRIZ starts from the state of the invention uncreation.

Relation to condition for patentability

・The patent of purpose = invention of the invention development work is improved.

・On patent inclination of invention and early patent evasion of the cooperation other companies

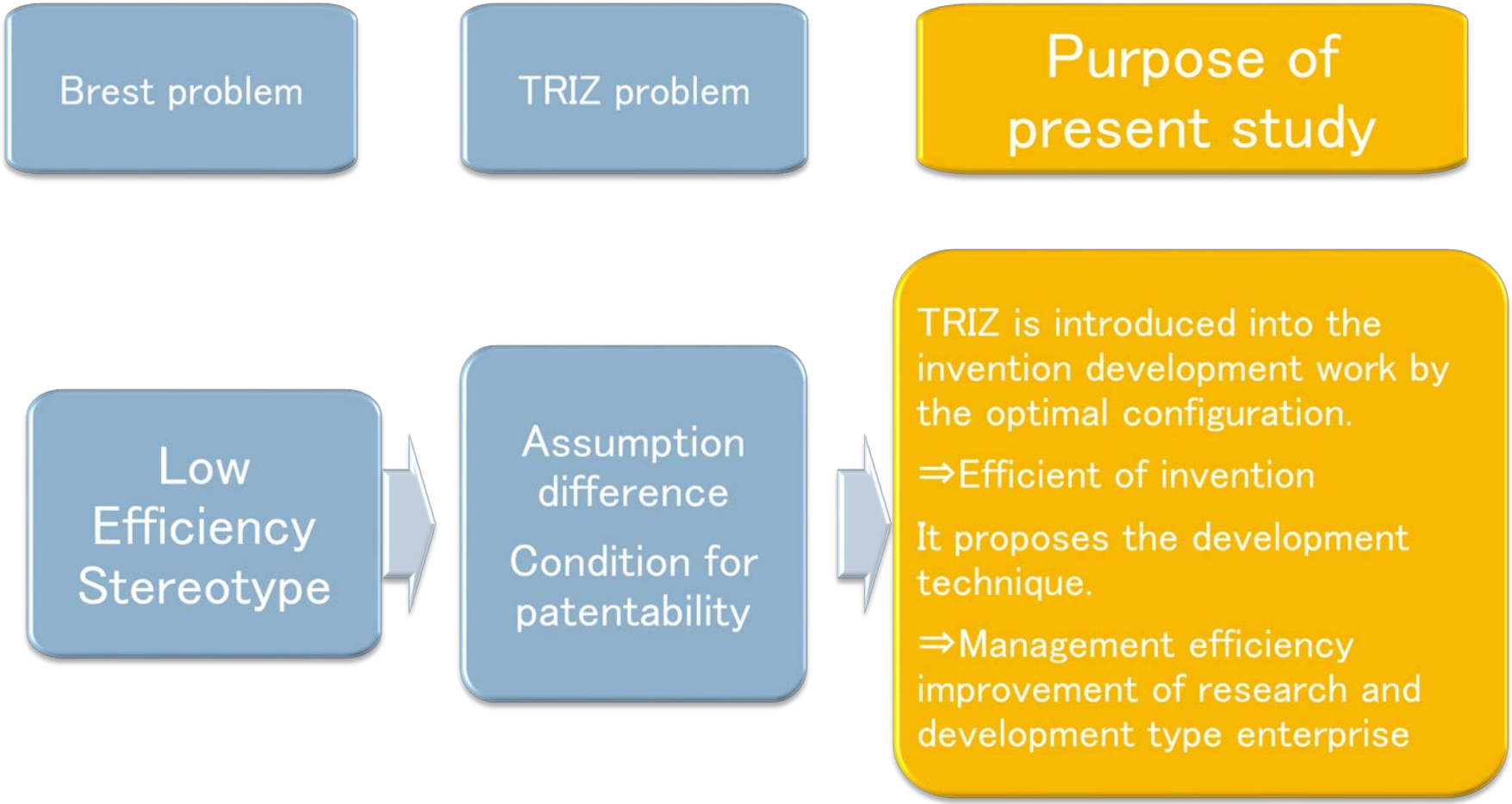
⇒Condition for patentability consideration main point

・As for TRIZ, the relation to the condition for patentability is not considered.

⇒It is difficult to apply TRIZ to the invention development work directly.

1. Investigative Purpose

Purpose of present study?



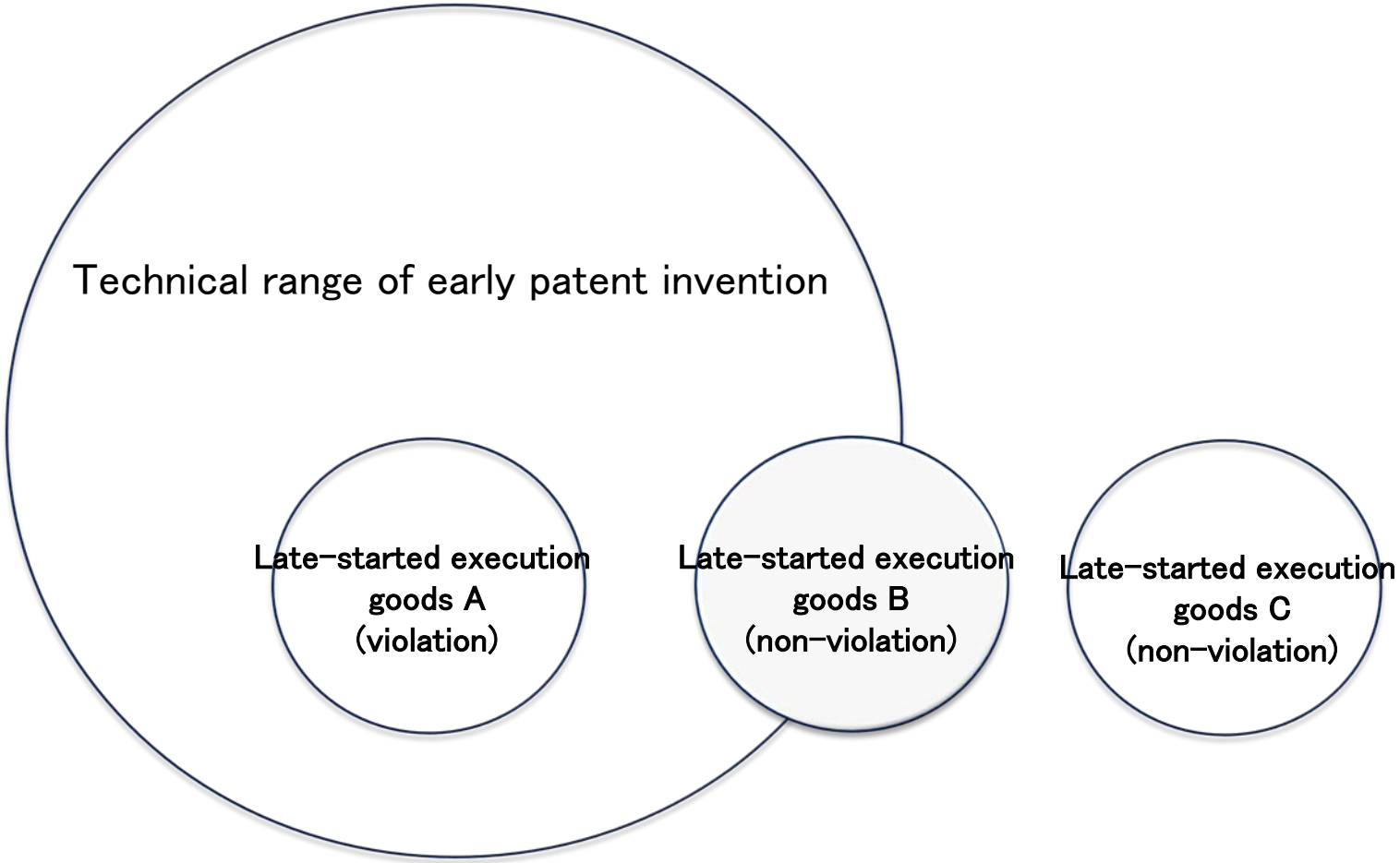
2. Examination point concerning patent

Condition for patentability

Name	Outline
Novelty	It should not be an invention (hereafter, invalidating art) etc. known to an unspecified person in Japan or the foreign country before the invention that demands making to the right applies for the patent.
Progressivity	It should not be the one that was able to be invented easily before the person where the invention that demands making to the right has usual knowledge in the field to which the invention belongs applies for the patent based on the invalidating art.
Single	It must be a technical feature in the invalidating art without, and there be a common technical feature for the invention of these two or more when the invention of two or more has been described to one patent application.

2. Examination point concerning patent

Patent evasion



3. Invention development technique of present study

Outline

"Technological contradiction solution" is applied in RE.

"Technological contradiction solution" is applied analogizing.

Step 1: The first principle is specific.

The invention principle (the first principle) corresponding to the invention of the client (the first invention) is specific.

Step 2: The first early principle is specific.

The invention principle (the first early principle) corresponding to the early invention of the competitors (the first early invention) is specific.

Step 3: The horizontal principle is specific.

A useful invention principle (horizontal invention principle) for a common problem solution is specific with the first invention.

(Give priority to the invention principles other than the first early principle.)

Step 4: The horizontal invention is derived.

The horizontal invention is derived by the horizontal invention principle.

3. Invention development technique of present study

Step 1

The 1:1th in step principle is specific.

The improvement characteristic (the first improvement P) and the deterioration characteristic (the first deterioration P) corresponding to the first invention are specific.

The cell (the 1st ..cell..) corresponding to deterioration P is improvement P・1 specific. by the first

The first invention principle corresponding to the invention is specific from the first invention principle of the cell.

The first subprinciple corresponding to the invention is specific from the first subprinciple of the first invention principle.

3. Invention development technique of present study

Step 1

②1次悪化Pを特定

Deteriorating characteristic / Improved characteristic		1	2	...
		Weight of movement object	Weight of body at rest	...
1	Weight of movement object			
2	Weight of body at rest			
3	Length of movement object	8, 15, 29, 34		
...	...			

③The cell is specific. by the first

④The first invention principle is specific.

⑤The first sub principle is specific.

①The first improvement P is specific.

Invention principle＝15. Principle of dynamics

Subprinciple：15a. It changes for the best operation.

15b. It divides and the relative displacement.

15c. Non-flexible architecture.. movement and adjustment

3. Invention development technique of present study

Step 2

Step 2: The first early principle is specific.

It is almost similar to step 1.

However, the early invention of not the first of client invention but the other companies is targeted.

– The improvement characteristic (the first early improvement P) corresponding to the first early invention The deterioration characteristic (the first early deterioration P) is specific.

The first early improvement P – The cell (the first early cell) corresponding to the first early deterioration P is specific.

The first early invention principle corresponding to the early invention is specific from the first invention principle of the early cell.

The first early subprinciple corresponding to the early invention is specific from the first subprinciple of the first early invention principle.

3. Invention development technique of present study Step 3

Step 3: The horizontal principle is specific.

Subprinciples other than the first subprinciple are specific as the subprinciple (horizontal subprinciple) that can be applied to the horizontal invention deriving from among the subprinciple of the first invention principle.

(Give priority to the invention principles other than the horizontal subprinciple.)

The invention principles other than the first invention principle are specific as the invention principle (horizontal invention principle) that can be applied to the horizontal invention deriving from among the invention principle of the first invention principle.

(Give priority to the invention principles other than the horizontal early principle.)

3. Invention development technique of present study

Step 3

Improved characteristic \ Deteriorating characteristic		1	2	・・・
		Weight of movement object	Weight of body at rest	・・・
1	Weight of movement object			
2	Weight of body at rest			
3	Length of movement object	8, 15, 29, 34		
・・・	・・・			

①The horizontal invention principle is specific.

②The horizontal subprinciple is specific.

Invention principle＝15. Principle of dynamics

Subprinciple：15a. It changes for the best operation.

15b. It divides and the relative displacement.

15c. Non-flexible architecture.. movement and adjustment

3. Invention development technique of present study

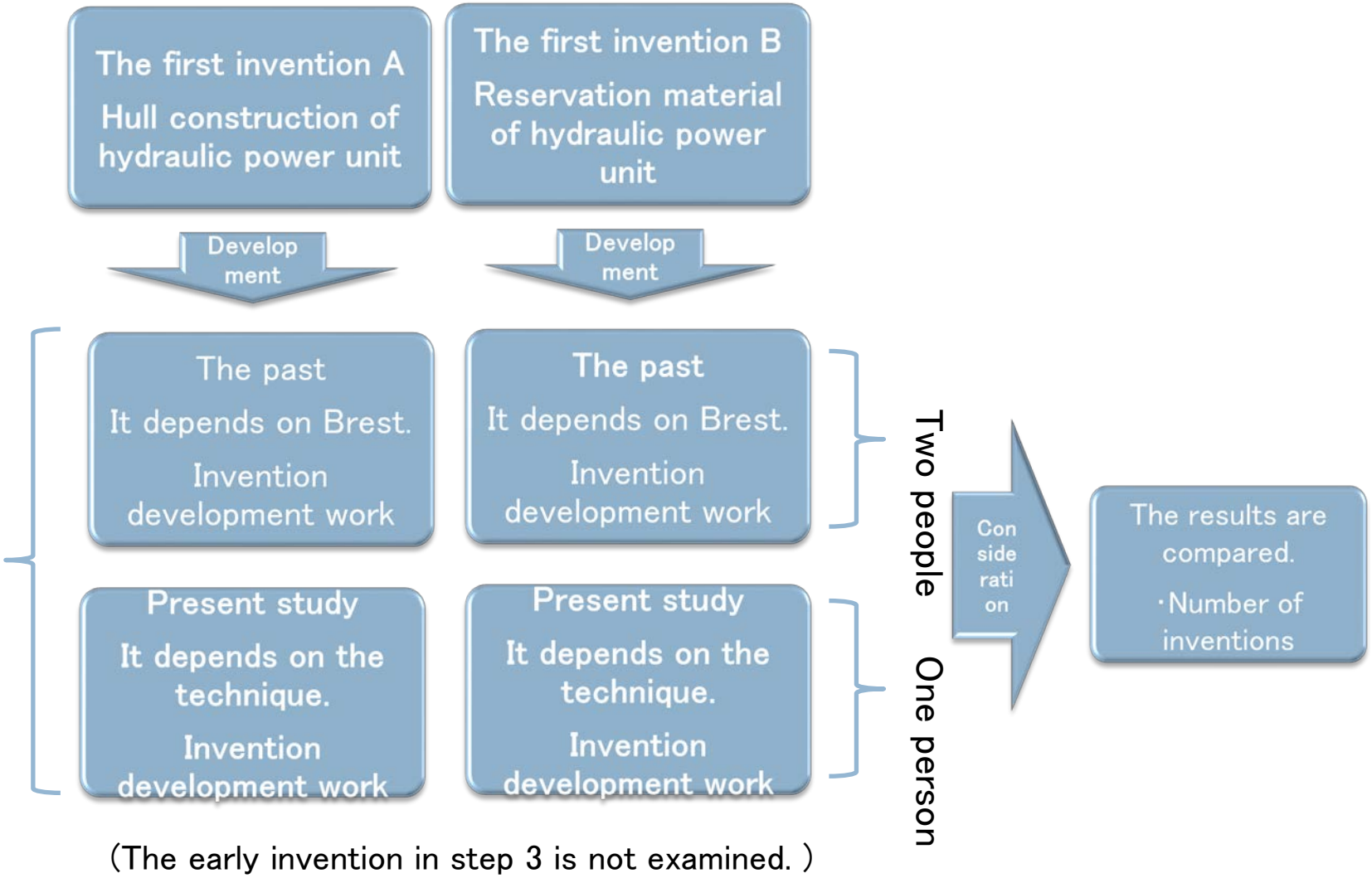
Step 4

Step 4: The horizontal invention is derived.

The horizontal invention is derived by the horizontal subprinciple.

The horizontal invention is derived by the horizontal invention principle.

4. Verification



4. Verification

Invention A

Technical field

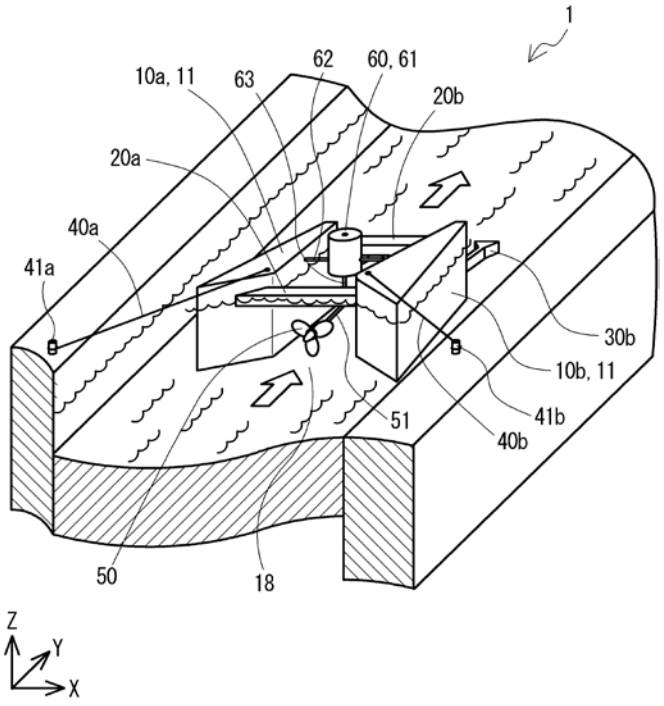
・Hull construction of hydraulic power unit that generates electricity in river

Background art

・The screw is arranged between a pair of floatage bodies.

Technical problem

・The screw rotation speed changes along with the volume of water change and the power generation efficiency is not steady.



4. Verification

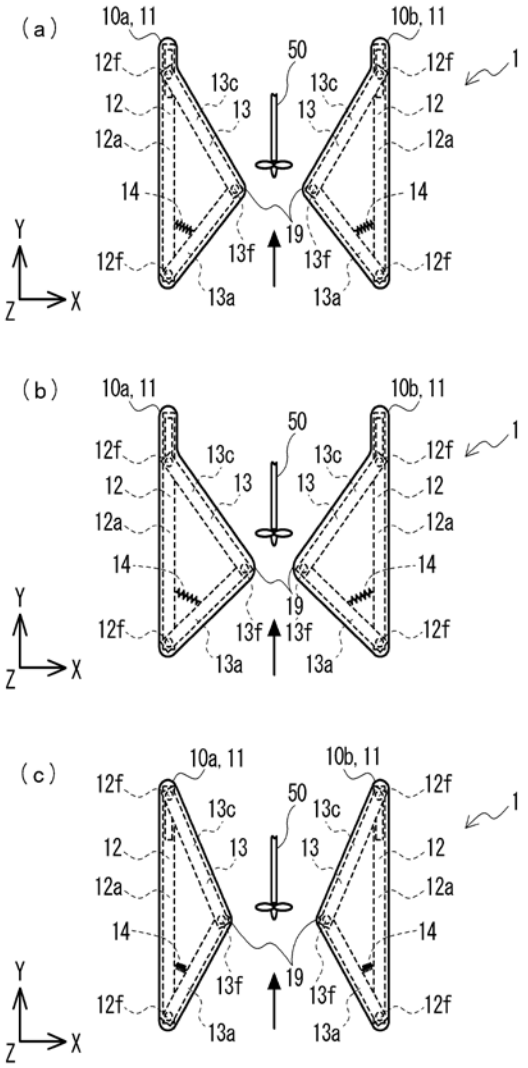
Invention A

The first invention

・Hydraulic power unit assumed to be able to assume that floatage body can be transformed in proportion to hydraulic pressure, and to adjust interval between floatage body and screw

・Concrete structure to assume that it is possible to transform it

= A part of the floatage body was assumed to be a slide structure, the slide part was supported with the spring, and it was assumed the structure to do the slide to the position in which hydraulic pressure and the elastomeric force balanced.



4. Verification

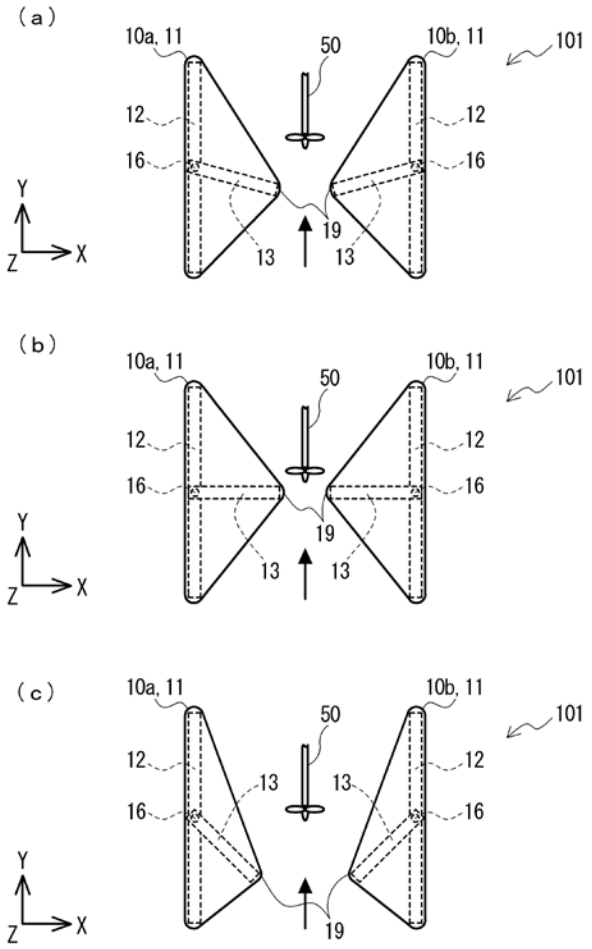
invention A

The horizontal invention derived in Brest

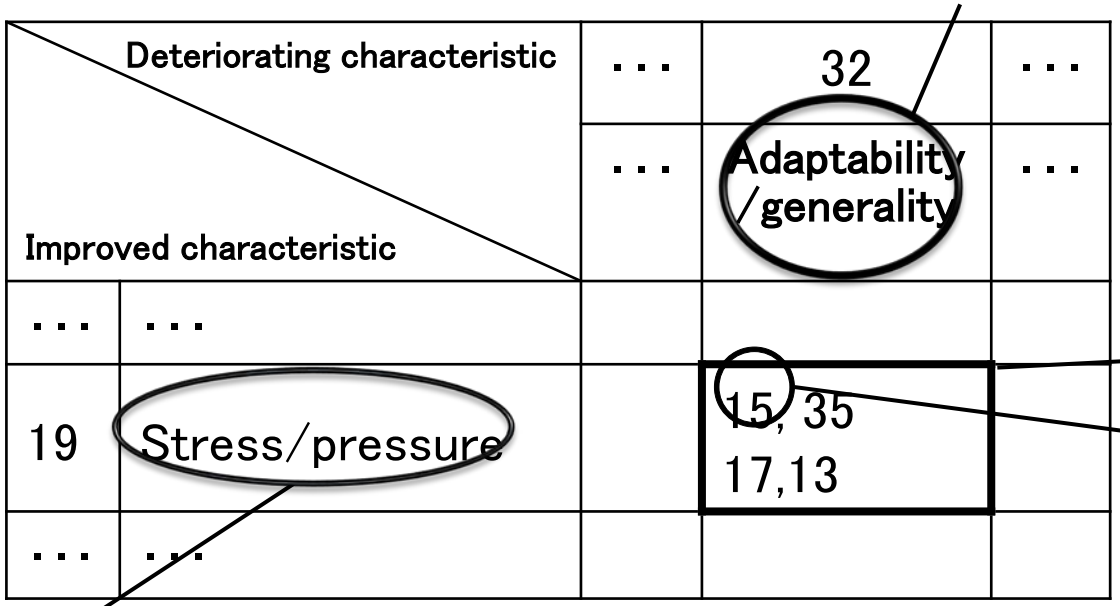
・Hydraulic power unit assumed to be able assume that floatage body can be transformed in proportion to hydraulic pressure, and to adjust interval between floatage body and screw

・Concrete structure to assume that it is possible to transform it

= A part of the floatage body was assume to be a link structure, and it was assumed structure that the manual operation was ab to move at the link position.



4. Verification step 1



Invention principle＝15. Principle of dynamics

Subprinciple：15a. It changes for the best operation.

15b. It divides and the relative displacement.

15c. Non-flexible architecture.. movement and adjustment

4. Verification step 2

Deteriorating characteristic / Improved characteristic		...	32	...
		...	Adaptability /generality	...
...	...			
19	Stress/pressure		15, 35, 17, 13	
...	...			

①The horizontal invention principle is specific.
35:Change in parameter
17:Another dimension
13:Reverse-conception

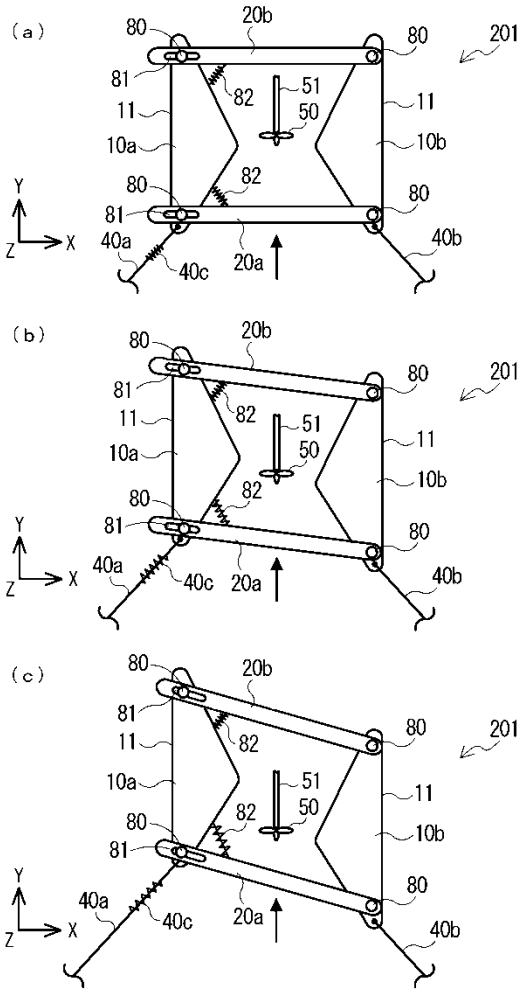
②The first subprinciple is specific.

Invention principle＝15. Principle of dynamics
Subprinciple：15a. It changes for the best operation.
15b. It divides and the relative displacement.
15c. Non-flexible architecture.. movement and adjustment

4. Verification step 4

Invention deriving by the horizontal subprinciple
″15b. It divides and relative displacement. ″

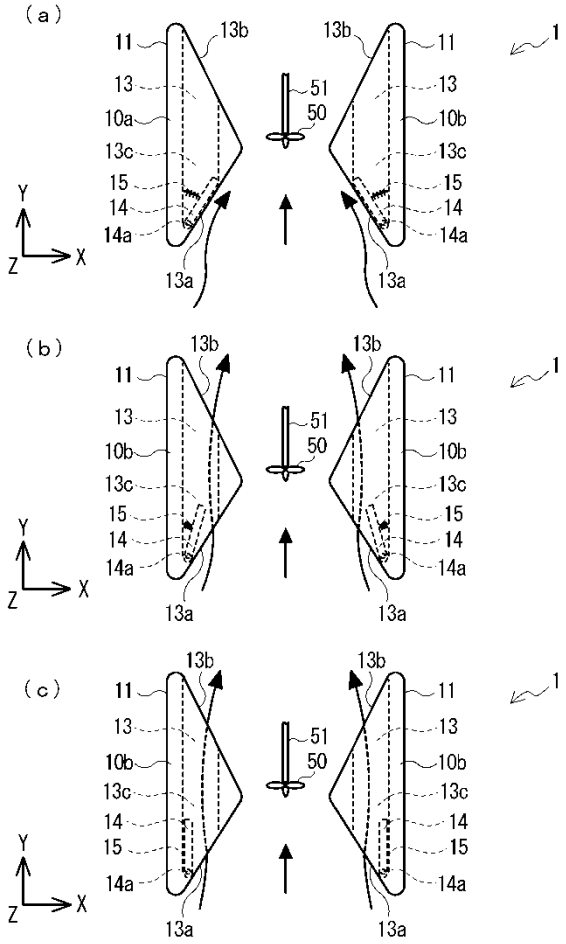
・The interval of the floatage body was enabled to assume that a pair of floatage body was able to be moved to each other, to reserve only one side ashore fixing, to assume that it was possible to move according to hydraulic pressure on the other hand, and to be adjusted.



4. Verification step 4

Invention deriving by the horizontal invention principle "17. another dimension"

・The pass road was formed to each floatage body, the lid of the pass road was supported with the spring, and it was assumed the structure that the lid opens and shuts to the position in which hydraulic pressure and the elastomeric force balanced.

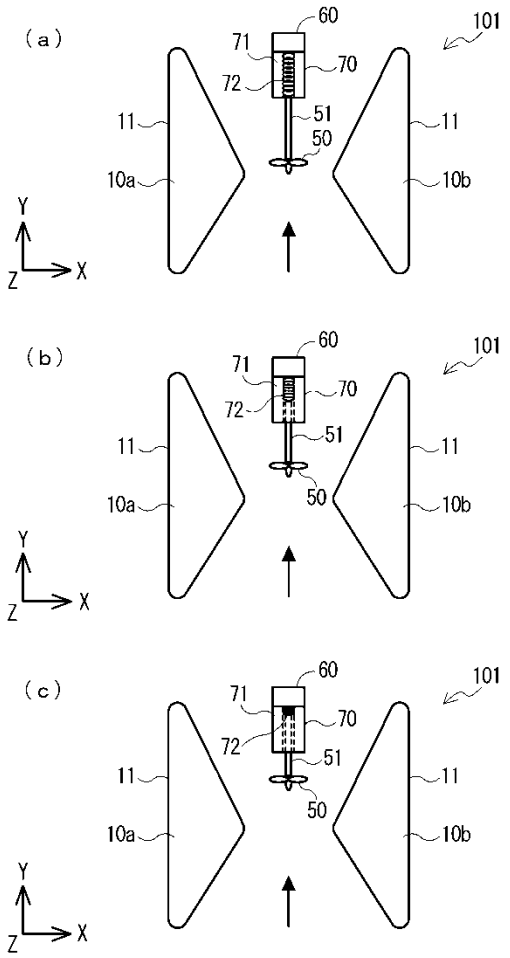


4. Verification step 4

Invention deriving by the horizontal invention principle "13. reverse-conception"

・The interval between the floatage body and the screw is adjusted by the floatage body is not moved but moving the screw.

・The screw was supported with the spring, and it was assumed the structure that the screw is located at the position in which hydraulic pressure and the elastomeric force balanced.



4. Verification consideration

Verification outcome

Invention	Number of horizontal inventions that were able to be derived by isochronal		
	Brest	Invention development technique by present study	
A	1	The one that the horizontal subprinciple was applied	1
		The one that the horizontal invention principle was applied	2
B	1	The one that the horizontal subprinciple was applied	0
		The one that the horizontal invention principle was applied	4

①More horizontal inventions are derived by isochronal compared with Brest.

⇒Invention development efficiency improvement

②It derives it by TRIZ.

⇒Fixed idea breaking down

③An increase in number of horizontal inventions

⇒On patent inclination

Technical range enhancing

④The invention derived by the horizontal subprinciple is characterized in the first invention and a common invention principle.

⇒Single fulfillment is easy.

5. Summary and problem in the future

Summary

・It was able to propose the deriving technique of the horizontal invention that applied TRIZ.

・Efficiency improvement and breaking down the stereotype became possible compared with Brest because it applied TRIZ.

・The number of horizontal inventions can be increased, and on the patent inclination and the technical range enhancing can be expected.

・Because the invention derived by the horizontal subprinciple is characterized in the first invention and a common invention principle, it is easy to fulfill the single in the condition for patentability.

・In the evasion of the early invention principle and the early invention subprinciple, the early patent evasion is easy.

Problem

・Because two or more invention principles are combined and the first invention is derived, the technique that can be applied for this case is examined.

・There are a lot of examination problems of the method of evading the early patent because it is not invention principle = composition requirement.

・The development technique of a subordinate position invention and a high-ranking invention is examined.

・Relativity with conditions for patentability other than the single is examined.