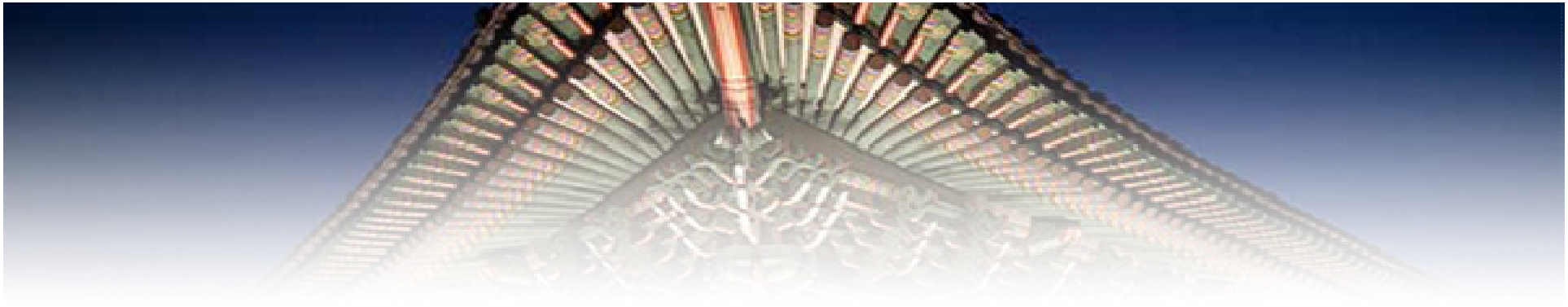

THE FUNCTION TREE ANALYSIS FOR NEW PRODUCT DEVELOPMENT

Young-Ju Kang
The 1st International TRIZ Master Level 5
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Contents

- Introduction
- Why New Modeling Method is needed?
- Function Modeling for Developing New Product
- FUNCTION TREE
- Algorithm
- Case Study
- Conclusion

Biography

Young-Ju Kang

First International TRIZ Master Level 5 (2010.7 ~ Present)

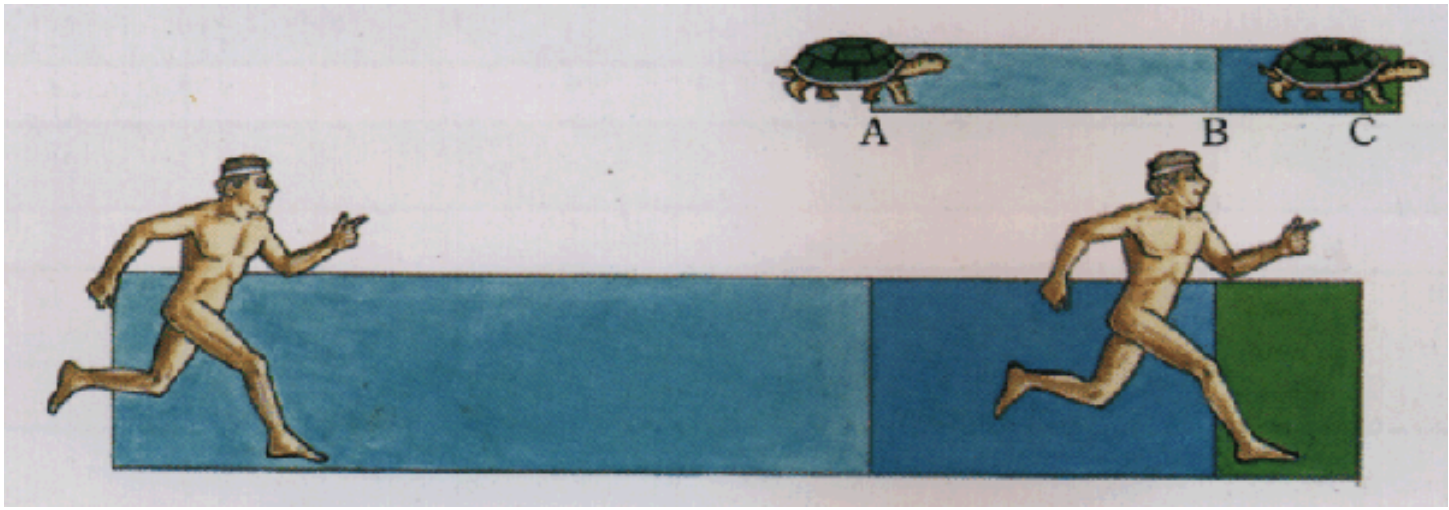
* POSCO (2010.3 ~ Present), Senior Manager
* Hyundai Motors (2007.8 ~ 2010. 2), TRIZ Manager
* LG-Cable (current LS-Cable, 2001.12~2007.7), TRIZ Manager

* BS & MS in Yonsei University (2001)
  - Thesis : 'TRIZ applied to Axiomatic Design for New Product Development and its applications. '
  - Stuidies : TRIZ, Value Engineering, Axiomatic Design, System Thinking, Patent, Knowledge Management, etc

- 55+ Patents and 15 thesis on TRIZ
- TRIZ Lecture at Korean Supreme Court (2010.11)
- Invited as Keynote Speaker at Malaysia TRIZ conference (2010.10) and Taiwan TRIZ Conference (2010.1)
- Opening Presentation at TRIZCON2005 & 2009

Introduction

Rare Resources & Time, How will we catch the First Runner? If we only benchmark them, we couldn't overcome them.



- How will we make Paradigm?
- How will we optimize our Ability?
- How can we be winner in the Market?

Productivity → Quality → Creativity

Introduction

CUSTOMER'S LOYALTY MAKES THEM BUY CONVENTIONAL BRAND

SONY

Introduction

Technical Forecasting/ New Product Development → For Market Winner

Cost Reduction

Process Innovation

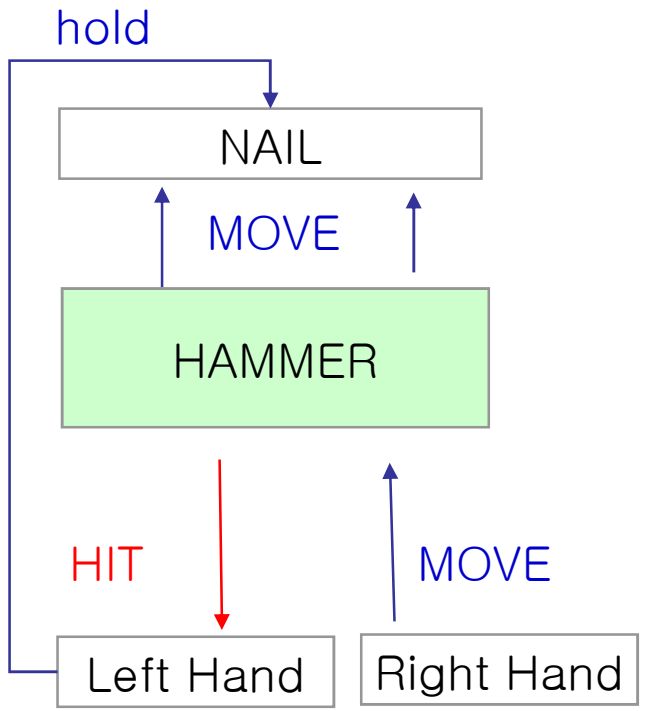
→ With Value Engineering

Patent Circumvention → For Fast Follower

System Improvement → TRADITIONAL AREA

Why New Modeling Method is needed?

Example: Function Modeling of Hammer



System Improvement

Patent Circumvention

Cost Reduction

Process Innovation

Why New Modeling Method is needed?

EVOLVE

?

EVOLVE

Develop Methodology for creation of new product

Why New Modeling Method is needed?

System Improvement

Patent Circumvention

Cost Reduction

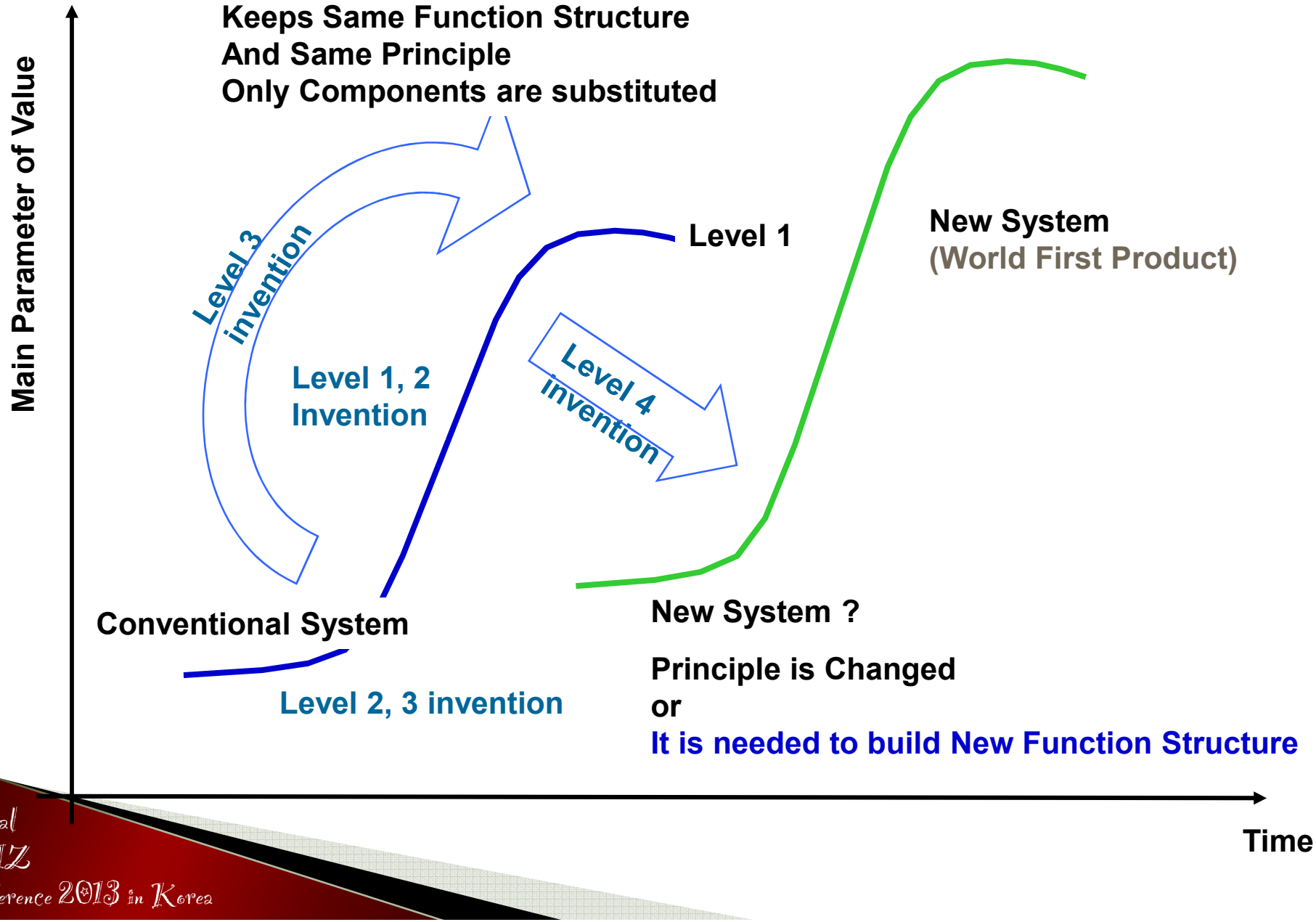
Process Innovation

1. When improving conventional system, function analysis is very useful.

Technical Forecasting/
New Product Development

2. When developing new product, there are usually no fixed component.
So it is required to develop new modeling for that.

Function Modeling for Developing New Product



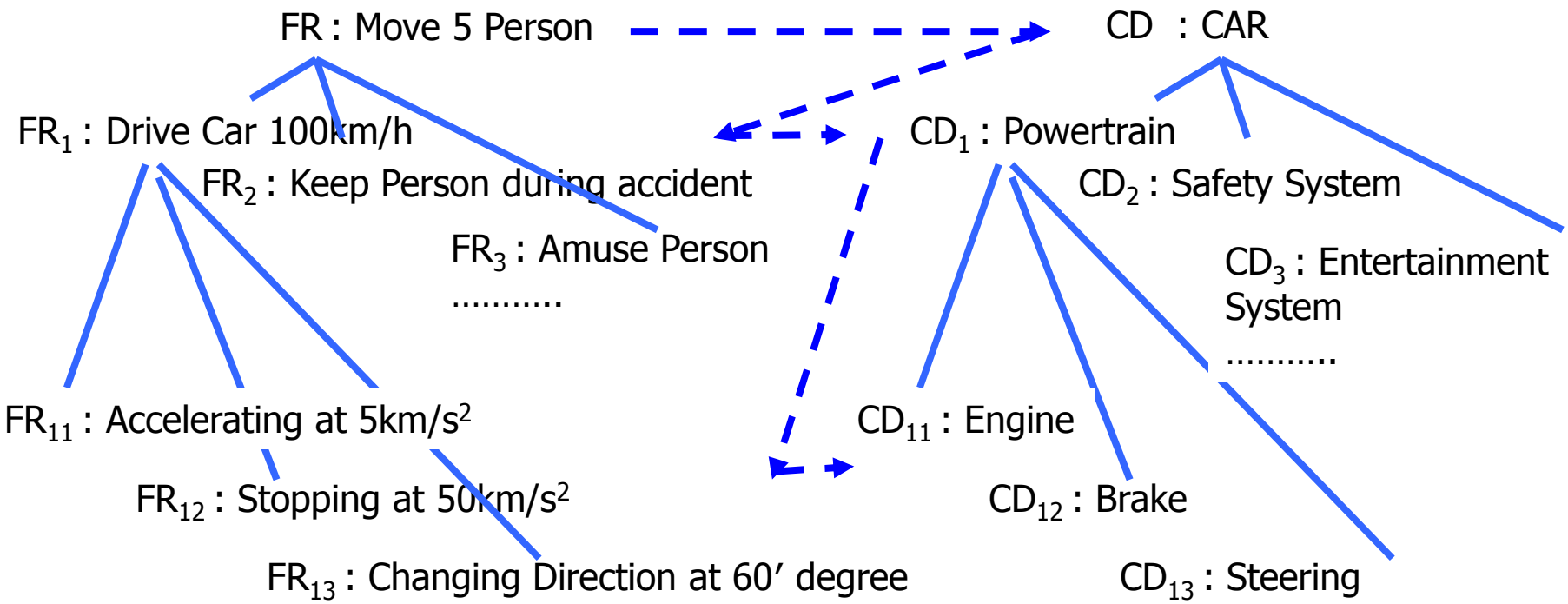
FUNCTION TREE

What
we want to
achieve

Functional Requirement
(FR)

Component Design
(CD)

How
we want to
achieve FR



FUNCTION TREE

Function Requirement (FR) : What we want to achieve			Component Design (CD) : How we achieve Function Requirement	
Rule	Function	Requirement	Component Design	Rule

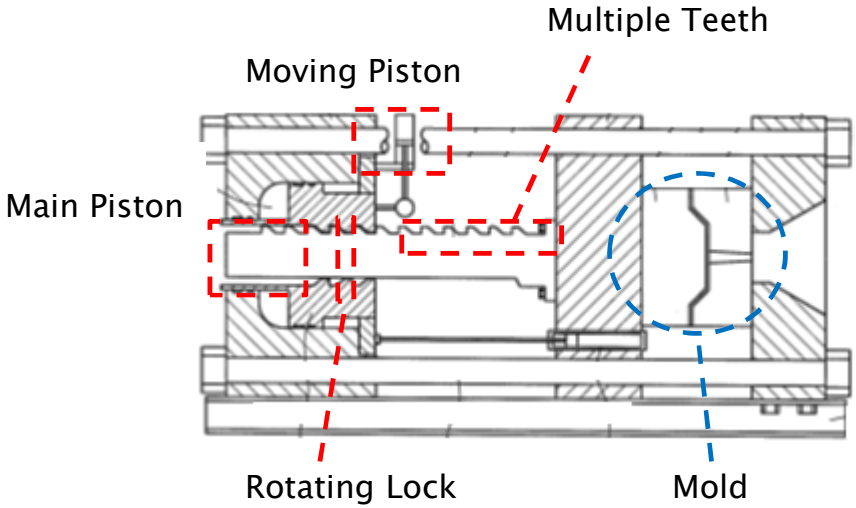
Algorithm

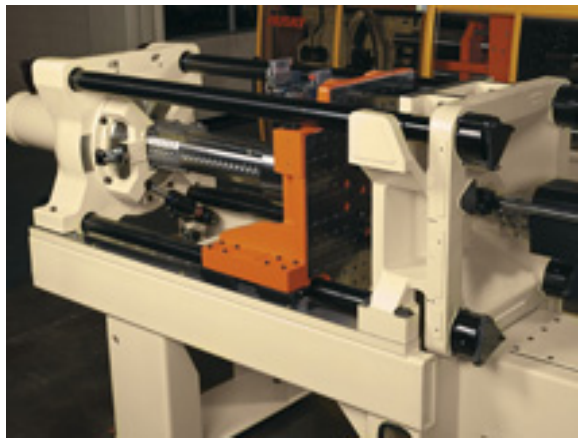
STEP 1 Define Highest Level of Function Requirement
STEP 2 Select Component Design (Benchmarking/Function Oriented Search)
STEP 3 Divide Function Requirement into Lower Level Function Requirements
1) According to Requirements
2) Into several identical ones
3) Which is Compensating Higher Level of Functional Requirement (Enhance or Correct)
STEP 4 Select Component Design (Benchmarking)
STEP 5 Analyze Component Design's Performance.
STEP 6 Repeat it until all satisfying Component Design is Found
STEP 7 Develop Real Embodiment according to Component Design
STEP 8 Evaluate New Design

Case Study

1. It is necessary to develop NEW INJECTION MOLDING MACHINE for new market needs. We assume there is no prototype for such system
2. It should adjust various type of mold
3. It should open and close mold within 0.5sec
4. It should press the mold by 1000Pa
5. The cost of the system should be low

There is one but need to develop "New Design"





Case Study

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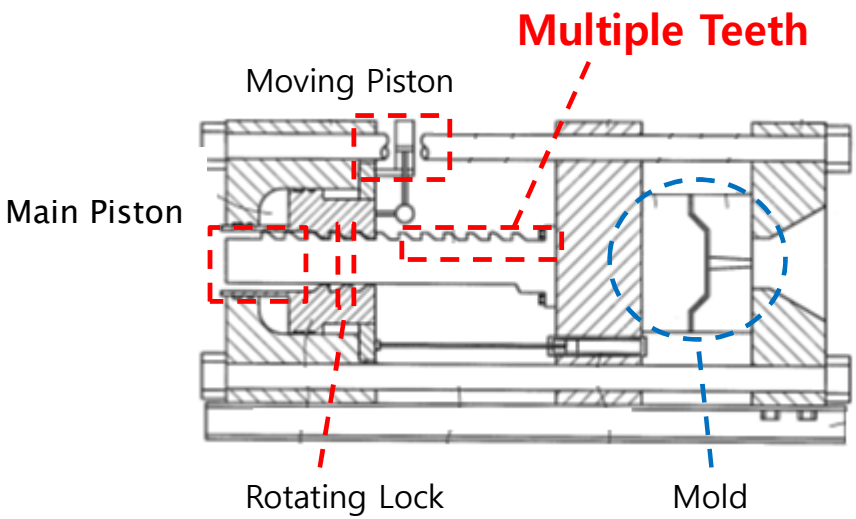

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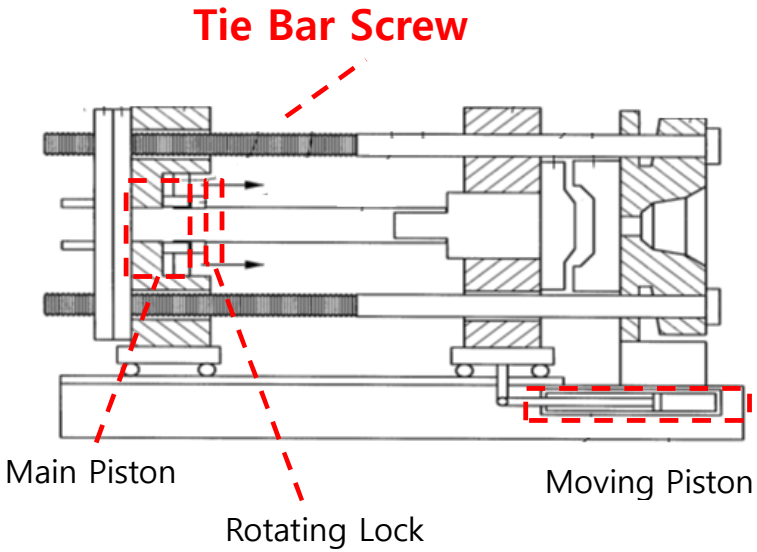

Conclusion

1. Function Tree Methodology for New Product is Developed, which is Algorithmic and Practical.
2. Function Tree is developed to build Function Model without Prototype.
3. Function Tree provide various model because it start from highest Function Requirement not analyzing Product itself.
4. Even there is prototype of system, Function Tree can be built and generate new concepts differ from prototype
5. New Injection Molding Machine is developed from different functions from conventional one