

# CS20A7381SS Systematic Creativity and TRIZ basics Online

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National Engineering Research Center for Technological Innovation  
Method and Tool

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# 1.Introduction to your topic(chapter 2)

Tyre breaker, also known as vehicle interceptor and stop nail, is often installed at toll stations and checkpoints.



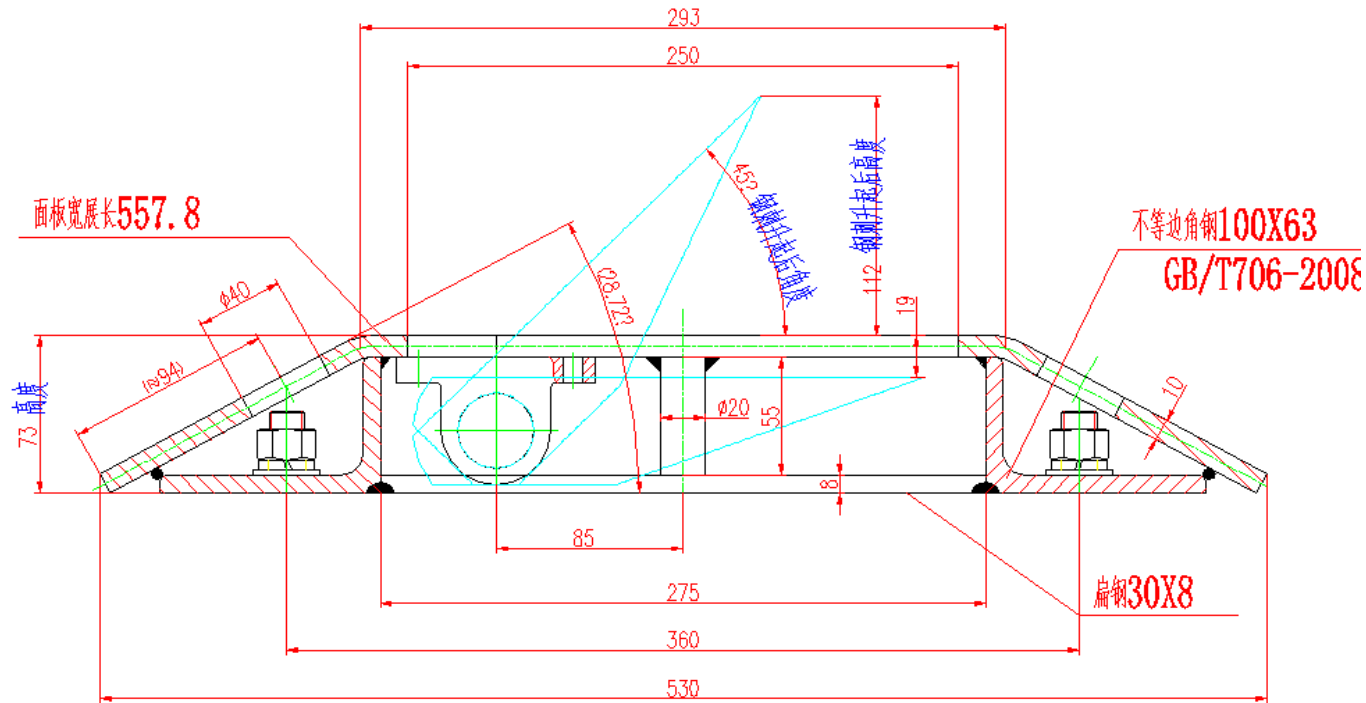
## 1)Background of problem

In 1998, tyre breakers were introduced into China, and then according to China's national conditions, tyre breakers were applied to key places such as wharfs, government departments and units. After years of development, the tyre breaker has evolved from pure mechanical to hydraulic, pneumatic and motor control. When an emergency occurs, the control motor starts and the tire breaker will rise in 0.5 seconds, puncturing the car tyre and making the target incapable of moving.

## 2) Problem description

The main problems are as follows:

1. The thickness of the tyre breaker is too big to cause the undercarriage of automobiles.
2. Fixed installation of tyre breaker, not removable



## 2. Patents for your system (chapter 3)

1. Identify the keywords : Tyre breaker
2. Choose the database: patsnap
3. Search

patSnap 搜索 工作空间 专利地图 邮件提醒 TA: ("破胎器") OR TTL\_ENTRANS: ("破胎器") OR ~ 98 条专利

AND 过滤关键词 分析 3D 专利地图分析 英策

申请(专利权)人 共 98 条专利 | 复制检索式 | 搜索小贴士 申请日从新到旧 50 保存到工作空间

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#	公开(公告)号	标题	原始申请(专利权)人	公开(公告)日
1	CN108891208A	自动化安全防护破胎器	宁海逐航工业产品设计有限公司	2018-11-27
2	CN108917483A	新式安全防护破胎器	宁海逐航工业产品设计有限公司	2018-11-30
3	CN108589592A	安全防护破胎器	宁海逐航工业产品设计有限公司	2018-09-28
4	CN109024375A	新型安全防护破胎器	练韩信	2018-12-18
5	CN109024374A	安全防护破胎器	练韩信	2018-12-18
6	CN109024373A	人性化安全防护破胎器	练韩信	2018-12-18
7	CN208309455U	一种遥控电动破胎器	王乐宇	2019-01-01
8	CN208055928U	一种破胎器	宁夏新盛华腾科技有限公司	2018-11-06
9	CN208072277U	一种反恐破胎器	钢精英智能科技(武汉)有限公司	2018-11-09
10	CN108061479A	隐蔽式遥控弹射破胎器	乾安县鸿安食品有限责任公司	2018-05-22
11	CN207419324U	一种浅层式液压破胎器	厦门杰田科技有限公司	2018-05-29
12	CN207419322U	一种新型双向电动破胎器	厦门杰田科技有限公司	2018-05-29
13	CN207419323U	一种电动破胎器	厦门杰田科技有限公司	2018-05-29
14	CN207419325U	一种减速带式液压破胎器	厦门杰田科技有限公司	2018-05-29
15	CN207537927U	简易破胎器	佳思德科技(深圳)有限公司	2018-06-26
16	CN304575922S	简易破胎器	佳思德科技(深圳)有限公司	2018-04-10
17	CN207088395U	破胎器主塑模具	浙江鼎海科技有限公司	2018-03-13
18	CN207091974U	破胎器	浙江鼎海科技有限公司	2018-03-13
19	CN206829010U	一种警用便携阻车破胎器	张潇	2018-01-02
20	CN107476560U	一种汽车胎压检测及汽车高速爆胎的强制保护装置	中山天达智能科技股份有限公司	2018-11-23
21	CN108859621A	一种汽车胎压检测及汽车高速爆胎的强制保护装置	龚立辉	2018-11-23

https://analytics.zhihuiya.com/patent\_view/view?patentId=7CE8C4936E8FA326C5FC92D1898615D003D5138A54

The result is 98 and many of them are suitable for my system.

### 3.Function of your system (chapter 4)

**The main function :** In order to prevent cars from rushing  
After years of development, the tyre breaker has evolved from pure mechanical to hydraulic, pneumatic and motor control. When an emergency occurs, the control motor starts and the tire breaker will rise in 0.5 seconds, puncturing the car tyre and making the target incapable of moving.



# 4.Function Oriented Search(chapter 5)

## **1.Identify the key problem to be solved:**

In order to reduce the height of the whole system, but will reduce the reliability of the whole system.

## **2.Articulate the specific function to be performed:**

harmful factors affecting objects;adaptability;become more intelligent

## **3.Formulate the required parametres:**

Thickness;fiexibility ;intelligent

## **4.Generalize the function:**

Interception vehicle ; Prevent vehicles from moving forward

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

Wharf; Organ Unit; Machine manufacturing

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

Pure machinery; Hydraulic, pneumatic and motor control

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

motor control

## 5.Applying of Biomimetics to your system(chapter 6)

When I see the mouse,I have an ideal:

I think the body of the tyre breaker is tall to ensure adequate internal space, and it be short to prevent it from touching the chassis of the vehicle.

But there are the contraption :Mouse get smaller when they drill holes, but they are normal at other times.

## 6.Ideal Final result four system(chapter 7)

- (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 body of the tyre breaker is tall to ensure adequate internal space, and it be short to prevent it from touching the chassis of the vehicle.

# 7.Contradictions for your system(chapter 8)

## **We have the Physical Contradiction:**

The body is tall to ensure adequate internal space, but it needs to be short to prevent it from touching the chassis of the vehicle.

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

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

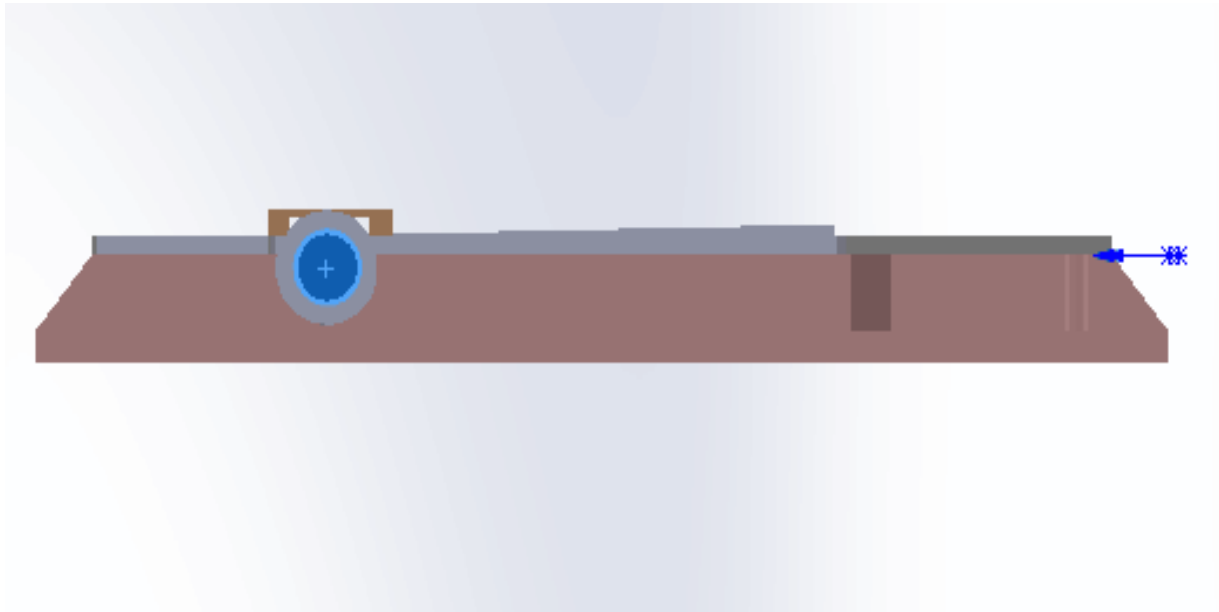
4.Asymmetry

24.Intermediary

26.Copying

# IDEA

The transmission shaft is moved to the outer part of the shell, and the height of the body is reduced without reducing its size.



## 8.TESE for your system(chapter 9)

**Acorrding the Law of Integrity of the 1/S-Curve Trend**

**Evolution to Complex Systems of the 2/S-Curve Trend**

**Law of Increasing Controllability of the 3/Ideality Trend**

We have the following solutions:

In order to increase the intelligence and operability of the system, remote control of the motor can be achieved through Bluetooth. Only one application can be downloaded and operated on the mobile phone, which improves the convenience.