

# Rubber Restrainer Device

 USA: 16/433,332 (2019)
  Canada: 54628-3001 (2019)
  Germany: 10 2019 115 105.8 (2019)
  New Zealand: 754284 (2019)
  Malaysia : PI2018702230 (2018)



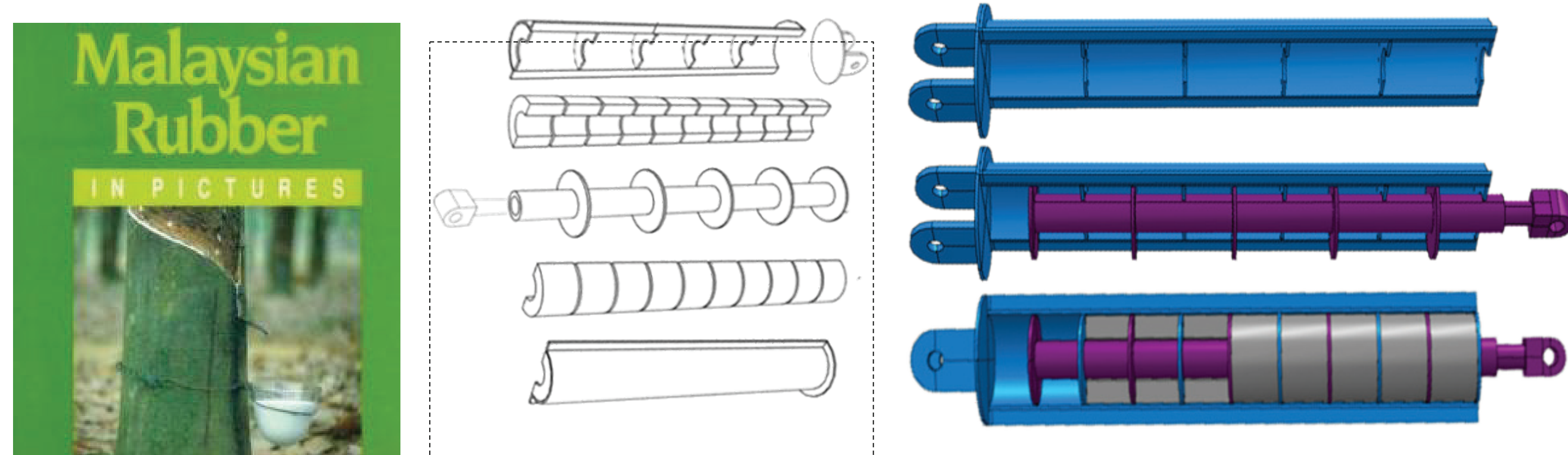
**RM 1,453,000**

## INTRODUCTION OF TECHNOLOGY

The experience of 2015 earthquake in Sabah which led to damage the structures and injure people indicated the need to improve the stability and strength of buildings, especially for seismic loads.

## INVENTION

In order to address this issue, many investigates are conducted by this researcher in Universiti Putra Malaysia since 2013 to use of natural rubber to develop innovative Rubber Restrainer Device applicable in bridges and buildings in order to provide nonlinear stiffness and act as restrainer to limit bridge span movement and prevent of bridge unseating during excessive movement.



### Our Strengths

- Patents family**
  - ✓ 14 National and International Patents Malaysia, USA, Japan, Canada, Turkey
  - ✓ 6 PCT Patent
  - ✓ 3 Copyright
- No maintenance**
- Available Raw Material**
- High Performance**
- Cost effective**
- Easy manufacturing**



### Comparison with Similar Product

Compare the performance with similar products	Rubber Restrainer Device	Viscous Damper Device	Viscous Wall Damper	Base Isolation	Conventional system
High Performance	32% Higher	×	✓	✓	×
Cost effective	30 to 50% less manufacturing cost	×	×	×	×
Maintenance Free (No leaking, no corrosion)	✓	×	×	×	×
Availability of Raw Material	✓	×	×	✓	✓
Easy Fabrication	✓	×	×	×	✓

### Market Segmentation

Buildings	Bridges
1) Tall Buildings 2) Conventional Structures 3) Space Frames 4) Residential Buildings	1) Seismic Damping Device 2) Unseating Preventing device 3) Controlling Traffic Load 4) Curve Bridge Settlement

## LOCAL MARKET SIZE

JKR reported the total number of the bridges as 6647 and classified the federal bridges in three age groups as:

- Group 1) Less than 40 Years → 3472 Bridges (52%)
- Group 2) Between 40 to 75 Years → 3000 Bridges (45%)
- Group 3) More than 75 Years → 172 Bridges (2.59%)

Therefore, based on JKR report, there is quite huge market in Malaysia for the Rubber Restrainer Device, however in a decade the number of the bridges need to be retrofitted would increase to more than 65%.

## GLOBAL MARKET SIZE

In global marketing, maintenance and repairing the bridges becomes political and monetary challenge. Based on American Society of Civil Engineers, in the United State, presents allocation for repairing the bridges is \$12.8 billion yearly, and it is estimated that this amount would increase to \$20.5 billion on 2028.



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