

APPARATUS FOR REPAIRING PIPES USING COMPOSITE WRAP

IITM Technology Available for Licensing

Problem Statement

- Pipelines are used in transportation of fluids like water, oil and gas, slurry, brine etc over long distances; **damages to the pipelines can be due to coating, erosion, corrosion or mechanical damage etc**
- In traditional repair techniques, repairing of pipelines requires the flow of an **internal fluid to be temporarily stopped to avoid a possibility of ignition or explosion of the internal fluid** where temporary stopping of the internal fluid, **result in huge losses**

Technology Category/Market

Category– Environment Engineering/ Heavy machinery
Applications – Transportation, Manufacturing, Design engineering, construction, pipelines

Industry – Manufacturing, Heavy machinery

Market - The global pipeline equipment market size was valued at \$12.5 billion in 2021, and pipeline equipment industry is **projected to reach \$18.7 billion by 2031, growing at a CAGR of 4.2% from 2022 to 2031**

Key Features / Value Proposition

Technical Perspective

- ❑ The present invention provides **an apparatus for repairing pipes using a composite wrap**
- ❑ **Capable of repairing corroded straight pipes** which has corrosion in the outer surface, where repair can be carried out **with out stopping the flow of gas or oil in the pipeline**
- ❑ The pair of repair chemical dispensing rollers helps to wet the sheathing material **wraps the defective surface of the pipe**

User Perspective

- ❑ Provides the wrap over the outer surface of the affected pipe **with minimum workforce**
- ❑ **Prevents leakage and capable of restoring maximum allowable transporting capacity of the pipeline**

Technology

The apparatus for repairing pipes using composite wrap includes:

- **Fixed Rings**-with grooves & mounted over the pipe
- **Rotating Rings** -mounted over the fixed rings
- **Roller Brush** -mounted over the rotating rings
- **Repair Chemical Dispensing rollers**
- **Pressing Roller** -exerts a rolling pressure on the sheathing material
- **Motor** that rotates the rotating rings

- ❑ **Rotating Rings** move within the guide grooves of the fixed rings
- ❑ **Roller Brush** cleans the defective surface of the pipe repair the defective surface of the pipe by **applying a layer of repair chemical to fill the damaged area**

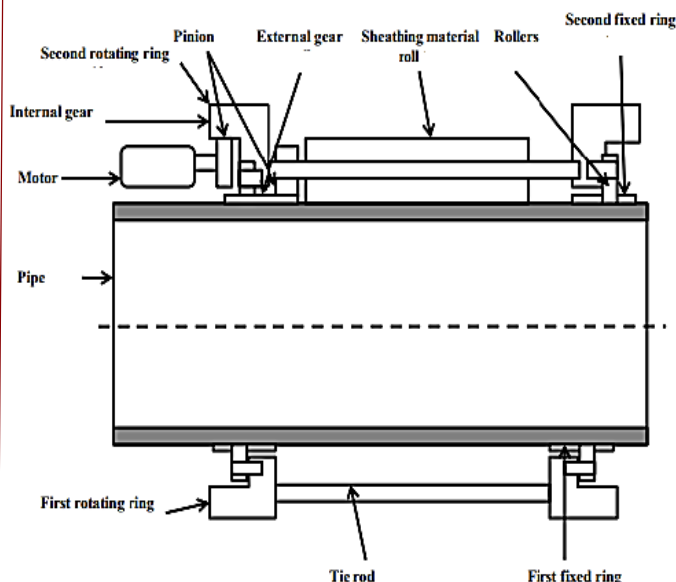


Fig. 1 illustrates a side view of apparatus for repairing pipes using composite wrap

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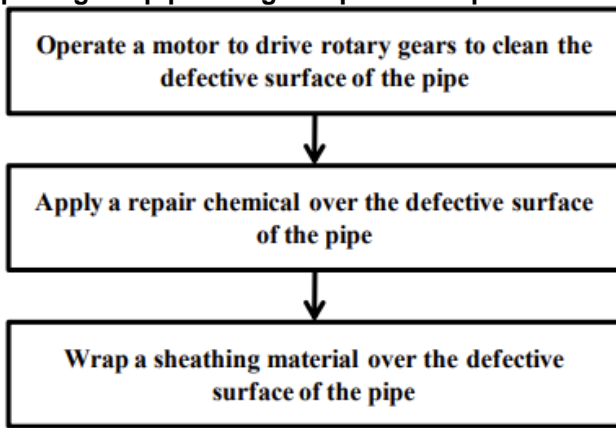
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- The said **pressing roller** exerts a rolling pressure on the sheathing material to provide a **homogeneous adherence** of the sheathing material to the defective surface of the pipe
- Also, a **motor with a pinion fixed with a fixed ring and a rotary gear** assembly for rotating the rotating rings **wraps sheathing material over the defective area on the pipe**
- Repair chemical includes glass fiber, a thermoset resin, and an epoxy

The flowchart below represents the **method of repairing the pipe using composite wrap**:



Images

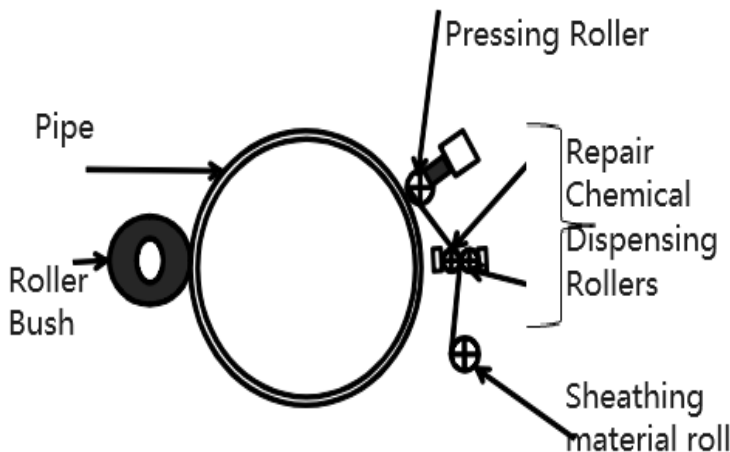


Fig. 2 illustrates a cross sectional view of the pipe as disclosed in the invention

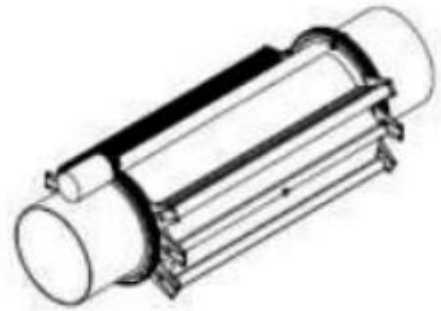


FIG.3 represents isometric view of the apparatus for repairing the pipe

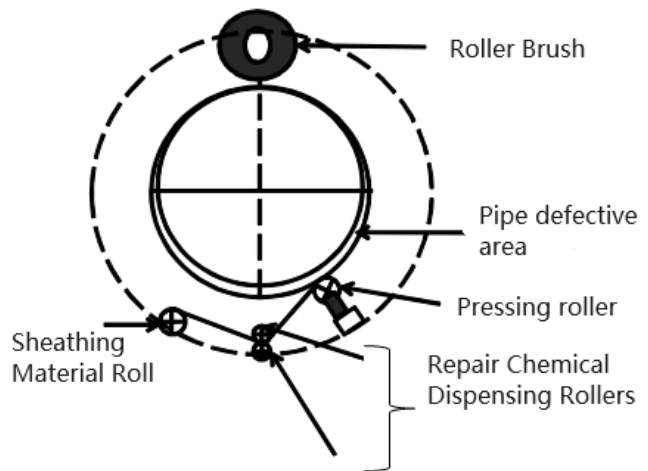


Fig. 4 illustrates a cross sectional view of the apparatus while wrapping the sheathing material on a lower half surface of the pipe

Intellectual Property

- IITM IDF Ref. 1468
- IN346452-Granted
- PCT/IN2017/050428

TRL (Technology Readiness Level)

TRL-2, Technology Concept Formulated

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