77. Title: A Flame-retardant Composition and its Applications

Inventor: Prof. S. Wazed Ali, Department of Textile and Fibre Engineering

Key Words: Cellulosic fibres, Flame retardant material, Load carrying structures, Low char length, Natural fibre rope

Domain: Textiles

Summary: A composition for treating a Sisal yarn to provide excellent flame retardancy characteristics is developed. The composition comprises of at least two polymers, and an acid in a specific weight ratio. The composition can be used in cellulose based natural fibre ropes for load bearing function, or as a flame retardant material. The flame retardant material is made using a plurality of load carrying strands and a jacket surrounding the strands. The mechano-chemical braided structured design of the flame retardant material provides a low chemical loaded self-extinguished sisal rope. The rope strength is not affected on superficial burning.

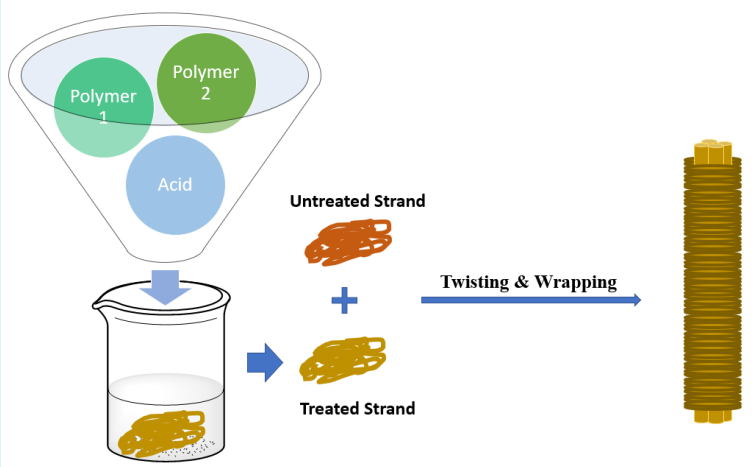

Diagram: schematic of flame retardant composition applied on Sisal yarn

Advantages:

- high tensile strength due to braided structure
- high limiting oxygen index (LOI) value (in the range 33-36)
- less than 45 mm distance can be teared by a burned area for a specific applied weight
- can safely be employed for various industrial load-carrying applications

Applications: For making ropes with superior tensile strength and elasticity property, marine industries, agro-textile applications, military applications, fire safety operations, fishing, shipping, transport, packaging purposes, making carpets, dartboards, wire cables of elevators, bags, etc.

Scale of Development: A flame retardant composition and a flame retardant material using this composition is developed, and proof of concept is demonstrated by testing extensively in laboratory.

Technology Readiness Level: 4

IP Status: Indian Patent Application 201711044261