Patent Search

Invention Title	DEVELOPMENT OF LOW COST PARALLEL AND COUNTER FLOWHEAT EXCHANGER
Publication Number	24/2024
Publication Date	14/06/2024
Publication Type	INA
Application Number	202441044179
Application Filing Date	07/06/2024
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	MECHANICAL ENGINEERING
Classification (IPC)	F28D7/16, F28F9/02, F28F9/22

Inventor

Name	Address	Country
V RAVI RAJ	Associate Professor, Department of Mechanical Engineering, Sri Sairam Engineering College, Tamil Nadu, Chennai-44.	India
Dr. P THARANIYA	Assistant professor, Department of Mathematics, Rajalakshmi institute of Technology, Tamil Nadu, Chennai - 600124	India
K S SRIRAM	EXECUTIVE (Solution Design), 3SC Solutions B-F2 Sai Akshayam Apartments Muthu Mohamed Street Puzhuthivakkam, Chennai - 91	India
Dr. K SHEKAR	Assistant professor, Department of Mechanical Engineering, Ballari Institute of Technology and Management, Ballari, Alipur - 583104	India
R KARTHIK	Assistant Professor, Department of Mechanical Engineering, Kongunadu College of Engineering and Technology, Trichy - 621215.	India
Mrs. M DHARANI	Assistant Professor, Physics Department, : Siddharth Institute of Engineering and Technology, Narayanavanam Road, Near Tirupathi-Chennai Highway, Siddarth Nagar, Puttur, Chittoor, Andhra Pradesh-517583	India
Dr. G M LIONUS LEO	Assistant Professor, Department of Mechanical Engineering, St. Joseph's College of Engineering, Old Mahabalipuram Road,Chennai 600119, Tamil Nadu,India	India
VENNAPUSA VENKATA SIVA REDDY	Associate Professor, Department of Mechanical Engineering, Sri Venkateswara Institute of Technology, College code (9F), N.H 44, Hampapuram, Rapthadu, Andhra Pradesh 515001	India
Dr. K P VASANTHA KUMAR	Assistant professor, Department of Mechanical Engineering, University College of Engineering, Ramanathapuram Campus, Ramanathapuram, Tamil Nadu, 623513	India
M ARAVINDAN	Research Scholar, VIT, Vellore Campus, Tiruvalam Rd, Katpadi, Vellore, Tamil Nadu 632014	India

Applicant

Name	Address	Country
G ASHWIN PRABHU	No. 11, Thirumagal Nagar, II Street, Karthick Avenue, Flat No. F1, First Floor, "Sai Guru Appartments", Chitlapakkam	India
V RAVI RAJ	Associate Professor, Department of Mechanical Engineering, Sri Sairam Engineering College, Tamil Nadu, Chennai-44.	India
Dr. P THARANIYA	Assistant professor, Department of Mathematics, Rajalakshmi institute of Technology, Tamil Nadu, Chennai - 600124	India
K S SRIRAM	EXECUTIVE (Solution Design), 3SC Solutions B-F2 Sai Akshayam Apartments Muthu Mohamed Street Puzhuthivakkam, Chennai - 91	India
Dr. K SHEKAR	Assistant professor, Department of Mechanical Engineering, Ballari Institute of Technology and Management, Ballari, Alipur - 583104	India
R KARTHIK	Assistant Professor, Department of Mechanical Engineering, Kongunadu College of Engineering and Technology ,Trichy - 621215	India
Mrs. M DHARANI	Assistant Professor, Physics Department, : Siddharth Institute of Engineering and Technology, Narayanavanam Road, Near Tirupathi-Chennai Highway, Siddarth Nagar, Puttur, Chittoor, Andhra Pradesh-517583	India
Dr. G M LIONUS LEO	Assistant Professor, Department of Mechanical Engineering, St. Joseph's College of Engineering, Old Mahabalipuram Road,Chennai 600119, Tamil Nadu,India	India
VENNAPUSA VENKATA SIVA REDDY	Associate Professor, Department of Mechanical Engineering, Sri Venkateswara Institute of Technology, College code (9F), N.H 44, Hampapuram, Rapthadu, Andhra Pradesh 515001	India
Dr. K P VASANTHA KUMAR	Assistant professor, Department of Mechanical Engineering, University College of Engineering, Ramanathapuram Campus, Ramanathapuram, Tamil Nadu, 623513	India
M ARAVINDAN	Research Scholar, VIT, Vellore Campus, Tiruvalam Rd, Katpadi, Vellore, Tamil Nadu 632014	India

Abstract:

This document presents a comprehensive study on the thermal design, construction, and performance of shell and tube heat exchangers, extensively utilized in vario such as power plants, refineries, and process industries. The study emphasizes the significant impact of pressure loss due to fouling on the performance of these hea and aims to predict the ideal performance condition considering different mass flow rates and associated heat transfer with respect to the fouling factor. The docum discusses the flow characteristics and heat transfer in helical heat exchangers, highlighting the enhancement of heat transfer due to centrifugal forces. The effectiven heat exchanger is calculated using the average heat transfer rate and the minimum heat capacity rate. The document provides a detailed account of the design of the the effectiveness calculation for parallel and counter flow heat exchangers. It elaborates on the fabrication process, which involves procuring the materials, ensuring dimensions of the materials meet the design specifications, preparing the shell for processing, and testing the heat exchanger. The components of the heat exchange the shell, tubes, baffles, transfer line exchangers, and tube sheet, are listed. The document also explains the operation of the heat exchanger, its advantages such as l environmental impact and minimal operating costs, and its applications in various fields like oil refining, preheating, oil cooling, steam generation, and more. The stud that shell and tube heat exchangers are highly adaptable and widely used in numerous applications, and their cleaning and repair are not overly complex.

Complete Specification

Description: Background of Innovation

The innovation at the heart of this patent filing is the development of a low-cost parallel and counter flow heat exchanger. Heat exchangers are pivotal components a multitude of industries, including power generation, waste heat recovery, manufacturing, air conditioning, refrigeration, space applications, and petrochemicals. A the various types of heat exchangers, shell and tube heat exchangers are the most commonly used due to their versatility and efficiency.

However, the operation of these heat exchangers often faces a significant challenge - the pressure loss caused by fouling, which directly impacts their performance. Previous research has primarily focused on studying the flow characteristics and heat transfer in helical heat exchangers, attributing the enhancement of heat trans helically coiled tubes to centrifugal forces. The innovation presented in this patent filing addresses these challenges by introducing a novel design and fabrication pr for shell and tube heat exchangers. The design calculations for the tube and the effectiveness of the parallel and counter flow heat exchanger are meticulously disc providing a comprehensive understanding of the innovation.

The fabrication process involves procuring the materials, ensuring the dimensions of the materials meet the design specifications, preparing the shell for processing testing the heat exchanger. The components of the heat exchanger include the shell, tubes, baffles, transfer line exchangers, and tube sheet. The finished project pr a heat exchanger that operates by allowing one fluid to travel inside the tube and the other fluid to flow within the shell. This design results in a lower environmenta and minimal operating costs, making it a cost-effective solution for various applications. In conclusion, this innovation provides a significant improvement over exist exchangers by offering a design that is not only efficient and adaptable but also cost-effective and environmentally friendly. The heat transfer should be greater tha

View Application Status