



MIND'SPARK

News Letter

Department of Mechanical Engineering

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Vikram Ambalal Sarabhai (12 August 1919 – 30 December 1971) was an Indian physicist and astronomer who initiated space research and helped develop nuclear power in India. He was honoured with Padma Bhushan in 1966 and the Padma Vibhushan (posthumously) in 1972. He is internationally regarded as the Father of the Indian Space Program.

Known as the cradle of space sciences in India, the Physical Research Laboratory (PRL) was founded in 1947 by Vikram Sarabhai.[8] PRL had a modest beginning at his residence, the "RETREAT", with research on cosmic rays. The institute was formally established at the M.G. Science Institute, Ahmedabad, on 11 November 1947[9] with support from the Karmakshetra Educational Foundation and the Ahmedabad Education Society. Prof. Kalpathi Ramakrishna Ramanathan was the first Director of the institute. The initial focus was research on cosmic rays and the properties of the upper atmosphere. Research areas were expanded to include theoretical physics and radio physics later with grants from the Atomic Energy Commission. He led the Sarabhai family-owned business conglomerate.

His interests varied from science to sports to statistics. He set up the Operations Research Group (ORG), the first market research organisation in the country. Most notable among the many institutes he helped set up are the Nehru Foundation for Development in Ahmedabad, the Indian Institute of Management Ahmedabad (IIMA), the Ahmedabad Textile Industry's Research Association (ATIRA) and the (CEPT). Along with his wife Mrinalini Sarabhai, he founded the Darpana Academy of Performing Arts. Other projects and institutions initiated or established by him include the Fast Breeder Test Reactor (FBTR) in Kalpakkam, Variable Energy Cyclotron Project in Calcutta, Electronics Corporation of India Limited (ECIL) in Hyderabad and Uranium Corporation of India Limited (UCIL) in Jaduguda, Jharkhand. Sarabhai started a project for the fabrication and launch of an Indian satellite. As a result, the first Indian satellite, Aryabhata, was put in orbit in 1975 from a Russian cosmodrome.[8] He was the founder of Indian Space Research Organisation.

Distinguished positions

- President of the Physics section, Indian Science Congress (1962)
- President of the General Conference of the I.A.E.A., Vienna (1970)
- Chairman of the Atomic Energy Commission of India (1966–1971)[10][11]
- Vice-president, Fourth UN Conference on 'Peaceful uses of Atomic Energy' (1971)
- Founder and Chairman (1963–1971), Space Applications Centre

PATENT PUBLICATIONS

For the invention titled "DESIGN & DEVELOPMENT OF APPARATUS FOR ABRASIVE JET-ASSISTED DRILLING AND CUTTING", Dr. A. Rajasekhar, Professor, Mr. Y. Madhu Maheswara Reddy, Assoc. Professor, Dr. P. Ravi Chander, Assoc. Professor, Mr. Md. Abdul Fazal, Asst. Professor, Mr. K.S. Raghavan, Asst. Professor, Mrs. P. Gayathri Lahari, Asst. Professor from the Department of Mechanical Engineering published a patent with application number 202141009214 A on 12th March 2021.

Abstract for the publication is given below for reference:

Apparatus for developing and handling an abrasive-laden gas stream for abrasive jet machining, employing equipment for storage, feeding, and control of abrasive powder in a carrier jet delivered through an upright feed tube at relatively high pressure and velocity. Abrasive Jet Machining (AJM) is the process of material removal from a workpiece by the application of a high speed stream of abrasive particles carried in a gas medium from nozzle. The material removal process is mainly by erosion. The AJM will chiefly be used to cut shapes in hard and brittle materials like glass, ceramics etc. the machine will be automated to have 3 axes travel. The different components of AJM are Horizontal motion module (X-Y Table), Vertical motion module (Z- motion), Vibrator, dehumidifier, Pressure Regulator, and Dust filter etc. The different components are selected after appropriate design calculations. In this project, a model of the Abrasive Jet Machine is designed using CAD packages like AutoCAD, CATIA etc. taking into consideration commercially available components. Care has been taken to use less fabricated components rather than directly procuring them,

because the lack of accuracy in fabricated components would lead to a diminished performance of the machine.

PATENT FOR INVENTION

For the invention titled "DESIGN, DEVELOPMENT AND TESTING OF FATIGUE TESTING MACHINE", Dr. A Rajasekhar, Professor, Mr. Y Madhu Maheshwara Reddy, Asst. Prof., Dr. P Ravi Chander, Assoc. Prof., Mr. Abdul Fazal, Asst. Prof., Mr. V Durgesh, Asst. Prof., Mrs. I Sowjanya, Asst. Prof., from the department of mechanical engineering published a patent with application number 202141009207A on 12th March 2021.

Abstract for the publication is given below for reference:

A fatigue testing machine comprising a motor for rotating a shaft on which are mounted an inertia loading member, a pair of supporting heads for mounting the test specimen, a lever and deadweight arrangement for loading the test specimen, characterised in that one end of the test specimen is attached to a rotatable disc having spaced slots cut on the face disc, an electromagnet interposed at the outer periphery of the disc whereby when voltage is applied to the coil of the magnet, the resulting cyclic magnetic force acting on the said magnet, the resulting cyclic magnetic force acting on the said disc produces a counter torque on the said shaft and thun a counter torque on the test specimen, thereby inducing a cyclic torsional stress on the test. Specimen Fatigue testing facilities are first classified in accordance with a number of features which include purpose, type of loading, and method of load application and transmit as well as control system. It is built on the understanding obtained from a vibration analysis of the force transfer function from the load cell of the machine to a fabricated calibration bar. Performing the dynamic characterization in practice consists of making a frequency sweep with the strain gauge equipped calibration bar. All the proceeding steps of analysis required to predict an upper bound of the linear measurement error is conveniently handled by software. The machine we made is a concept machine and we are not taking into account any of the features like efficiency & output of the machine, servicing cost of the machine etc. The machine made by us is based on the machines used in the different industries. We obtain the s-n curves on the basis of the testing of different types of material which are being tested. The result that we get after the testing should match the standard s-n curve of that material

JOURNAL PUBLICATION

Dr.P.Prabhu Raj from Department of Mechanical Engineering got his paper titled "Stir zone stress corrosion cracking behaviour of friction stir welded AA7075-T651 aluminium alloy joints" published in the journal "Corrosion review Journal - De Gruyter". The paper carrying ISSN number 2191-0316 can be found at <https://www.degruyter.com/document/doi/10.1515/correv-2020-0065/html>

Dr. Matam Prasad & Dr. A Rajasekhar from Department of Mechanical Engineering got their paper titled "Differential Gear Box To Reduce Vibration Using Different Materials For Vehicles-A Review" published in the journal "TURCOMAT". The paper carrying ISSN number 1309-4653 can be found at <https://www.turcomat.org/index.php/turkbilmat/article/download/1382/1152>

Dr. Matam Prasad from Department of Mechanical Engineering got their paper titled "Design and development of servo stabilisation system for airborne radar applications" published in the journal "Academia Journal of Scientific Research 8(11): 354-361, November 2020". The paper carrying ISSN number 2315-7712 can be found at <https://academiapublishing.org/journals/ajsr/pdf/2020/Nov/Parvathi%20et%20al.pdf>

Department of Mechanical Engineering

VISION

To be a reputed centre of excellence in the field of Mechanical Engineering by synergizing innovative technologies & research for the progress of society.

MISSION

M1: To impart quality education by means of state-of-the-art infrastructure.

M2: To involve in training & activities on leadership qualities & social responsibilities.

M3: To inculcate the habit of lifelong learning, practice professional ethics & serve the society.

M4: To establish industry- institute interaction for stakeholder development