Association for Machines and Mechanisms News Bulletin

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Our Objectives and Activities

The main objective of AMM is to contribute to mechanical design at all levels starting from academic research to industrial initiatives, thereby enhancing the quality and reliability of indigenous machines. With this in view, AMM organises the National Conference on Machines and Mechanisms, NaCoMM, and the workshops on Industrial Problems on Machines and Mechanisms, IPRoMM regularly.

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Contact Details

Dr. S. Bandyopadhyay
Secretary, AMM
Tel: (044) 2257 4733 (O)
Fax: (044) 2257 4732
E-mail: secretary@ammindia.org
Web Site:
http://www.ammindia.org

Message from the Editor-in-Chief

Technological issues of the Handloom Weavers

There has been a tremendous growth of mechanized textile production in past few decades. This has affected the handloom weavers adversely and it has lost much of its market. However, handlooms are still a force to reckon with. India's textile sector comprises four important segments namely: modern textile mills, independent power looms, handlooms, and garments.

Handloom sector employs a considerable number of people especially in a rural area which is under threat due to relentless march towards modernization and sophistication. The handloom sector needs attention to safeguard heritage and employability to the weavers of handloom sector which provides employment to an estimated 12.5×10^6 people and is the largest rural employment. According to surveys conducted by NGOs, the country has more than 3.8×10^6 handlooms.

In order to bring this sector sustainable, the improvements in the design of the looms need to be taken up, though the constraints and the bottlenecks are many. The lack of change is not due to the weaver not being amenable to change, it is rather due to unwillingness of the investor to take risks and provide incentive to weavers for effecting the desired changes. Though the researchers have tried for incorporating modifications in the existing designs, much success could not be achieved primarily due to non-involvement of rural artisans, confinement of technologies to the R&D institutions, and initiation of R&D as per convenience of researchers and not as per the need of rural artisans.

There is still a considerable global interest in Indian handloom products; R&D is therefore an essential ingredient for this sector to keep pace with the fast changing world. However, there are various technological issues pertaining to this sector which need to be addressed by the researchers:

- There is not much use of skill in present weaving methods.
- Most of the weavers use old Pit or wooden frame looms, which are less efficient.
- Weavers are not using take-up motion.
- The looms are quite old, which limits the productivity of the weavers to a great degree.
- The process of designing is quite slow and cumbersome.
- They are not using dobby in the craft.
- The pre-loom processes such as warping, winding, drafting, denting etc. are also time consuming and laborious for most of the weavers.
- Winding Charkhas and loom accessories such as reed, healds, shuttles etc. are also old.

Attention is being paid towards the growth of this sector at various levels. Steering Committee on Handlooms and Handicrafts Constituted for the Twelfth Five Year Plan (2012 – 2017) has given various recommendations for Design and Technology Upgradation for promoting technological interventions in this sector. Few recommendations are listed as under:

- Introduction of new designs, including dissemination of already developed designs, and development/adoption of innovative technologies and technical processes should be undertaken to enhance competitiveness of the handicraft products for ensuring export growth as well as domestic sales.
- Prototypes developed in design workshops and integrated projects must be showcased in exhibitions and must be in public domain.

In order to preserve one of the ancient Cottage Industries of India, initiatives are required to be taken by the researchers in dealing with such issues as has been done by few researchers in past.

Rajesh Sharma, Editor-in-chief

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RuTAG@IITs: Technical Interventions for Social Change

Jagpal Singh and Rajkumar Gupta, RuTAG-IIT Delhi

The Office of Principal Scientific Advisor (PSA) to Govt. of India has conceptualized a mission called **Rural Technology Action Group** (**RuTAG**). RuTAG is a synergizing and catalyzing mechanism to provide a higher level of Science and Technology (S&T) intervention and support. This intervention is essentially demand-driven, could be for technology up-gradation, hi-tech delivery, technology training and demonstration or through any other innovative method. The coordination of RuTAG activities has been assigned to the IITs. RuTAG activities are going on in the 7 IITs (Madras, Khagagpur, Guwahati, Bombay, Roorkee, Ropar and Delhi).

RuTAG-IIT Delhi was established in January 2009. IIT Delhi has been allocated to coordinate the RuTAG activities in the states of Madhya Pradesh, Uttar Pradesh, Rajasthan and Haryana. The idea is to identify technology needs of the region, available technology solutions, problems encountered in adopting the existing technology at the grassroots, identify R&D institutions which can improve the technology to suit the local conditions and assessment of the existing technology. RuTAG-IIT Delhi brings together some of the technical institutions from its coordinated states and the S&T-based rural groups involved in implementing technological programs at the grassroots. RuTAG-IIT Delhi encourages also the students of technical institutions to take up such projects which are acknowledged.

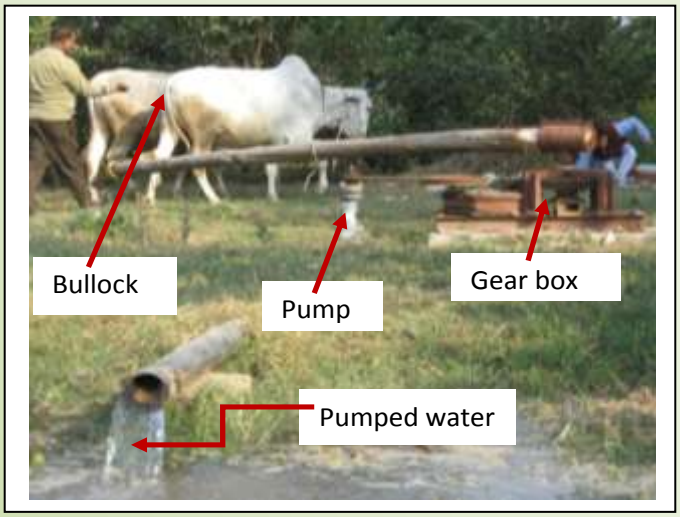

Fig. 1 Animal driven water pump

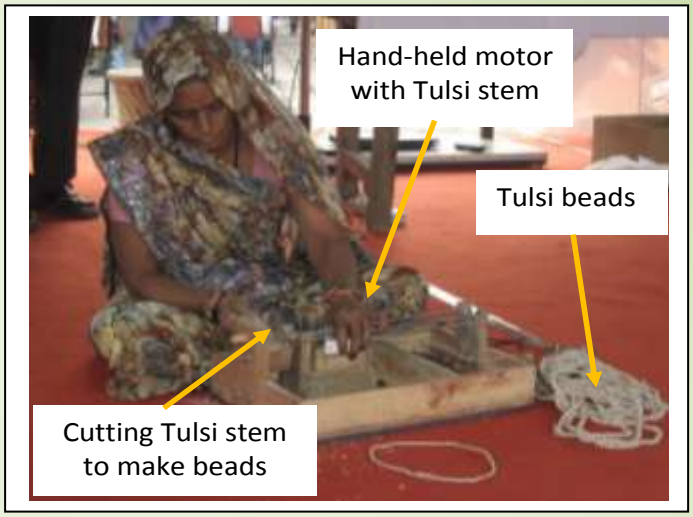

Fig. 2 Making of beads for Tulsi mala

Besides technical staff engaged in RuTAG-IIT Delhi projects, many M. Tech and B. Tech students are working part-time (2-4 hours a week) to perform design calculations and analyse systems using advanced software like ANSYS, ADAMS, etc. That way, they are able to use the advanced knowledge for the solution of their countrymen working in unorganized sectors. While such activities are helping to uplift the living conditions of their countrymen they have also given a new dimension to the research scenario of the world, as initiated by Stanford University of USA too under the banner of "Entrepreneurship Design for Extreme Affordability." As per the feedbacks of such students, these contributions are not only making them happy by thinking that they are able to do something for the society outside their academics but helping them to get jobs in good companies like Tata Motors, etc.

Some of the completed projects at IIT Delhi are: (1) Evaluation and Standardization of Animal Driven Water Pump (Fig. 1); (2) A Comparative Study of Bullock Driven Tractors; (3) Improvement of Biogas Conversion Kit; (4) Management Development Programme for Rural Enterprises.

Few on-going projects are: (1) Technology Standardization and Development of Testing-Cum-Training Facility for Ultra Micro-Hydel power Package for Rural Applications; (2) Utilization of the Standardized Animal Driven Gear Box for Multiple Rural Applications; (3) A Device for making Beads of Tulsi Mala (Fig. 2); (3) Improved Design to Reduce Drudgery in Operation of the Human-operated Treadle Pump for Irrigation; (4) A Technology Package for Garlic Processing for Value Addition; (5) A Machine for De-husking of Minor Millets.

For more information on RuTAG-IIT Delhi: Visit http://rutag.iitd.ac.in

Forthcoming Events

1st International and 16th National Conference on Machines and Mechanisms (iNaCoMM 2013)

December 18 - 20, 2013
Mechanical and Industrial Engineering Department
Indian Institute of Technology, Roorkee - 247667, India

IFToMM

The topics for iNaCoMM 2013 include, but are not limited to:

- Analysis and Synthesis of Mechanisms
- Compliant Mechanisms
- Design and Analysis of Biomedical Devices
- Dynamics and Control of Multi-body Systems
- Dynamics and Vibration Analysis in Machines
- Fault Diagnosis and Health Monitoring
- History of Machines and Mechanisms
- Mechatronic Systems
- Mechanisms and Machines for Rural, Agricultural and Industrial Applications
- Micro-, Nano-Machines and Mechanisms
- Modeling and Simulation
- Robotics
- Theoretical and Computational Kinematics
- Tribology

For details please visit: http://www.nacomm2013.org/

Special session will be organised on:

Multibody Dynamics:
Prof. S. K. Saha, IIT Delhi
Prof. Javier Cuadrado, Spain (Chair of IFToMM TC for Multibody Dynamics)
Bond Graph Modelling of Mechanical and Mechatronic Systems:
Dr. A. K. Samantaray, IIT Kharagpur
Prof. Rochdi Merzouki, Ecole Universitaire Polytechnique de Lille, France.

IMPORTANT DATES:

Submission of Abstract	March 31, 2013
Submission of Full Paper	May 31, 2013
Submission of Accepted Camera-Ready Paper	October 15, 2013

Robotics Society of India is initiating a new conference series to be held on a regular basis for creating a forum to present and exchange new ideas. Advances in Robotics (AR-2013), an International Conference of Robotics Society of India, will be held at Pune, during July 04-06, 2013 at R&DE (Engrs), DRDO. Papers are invited describing original work in all areas of robotics focusing in particular on new emerging areas including but not limited to:

- Kinematics, dynamics, control, and simulation of robots and autonomous intelligent systems
- Design of robotic mechanisms
- Man-machine interface and integration
- Robotics-related computer hardware, software, and architectures
- Vision and other non-contact sensory systems
- Tactile and other contact sensory technology
- Active sensory processing and control
- Machine learning and artificial intelligence for robotics
- Medical and Assistive Robotics
- Bio-mimetic and Bio-inspired Robotics
- Swarm Robotics

The Conference will have plenary talks, oral and poster presentations and special industry oriented sessions. For additional Information and instructions about paper submission please visit the web page http://www.rsindia.org/

- Last Date for Submission of Papers: 28.02.13

For Details contact:

- Prof. Ashish Dutta,
  Dept. of Mechanical Engg.
  IIT Kanpur, adutta@iitk.ac.in
- Prof. Santanu Chaudhury
  Dept. of Electrical Engg.
  IIT Delhi, santanuc@ee.iitd.ac.in

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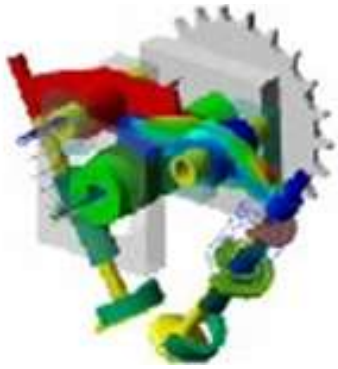

http://www.functionbay.co.kr

RecurDyn, based on multi-body dynamics, is the CAE software for multi-physics solutions. Starting with just multi-body dynamics in 2004, **RecurDyn** became the first Multi-Flexible Body Dynamics (MFBD) to integrate multi-body dynamics and non-linear finite element methods into its numerical integrator, which opened the new paradigm in the field of multi-physics CAE.

Today, **RecurDyn** continues to lead the multi-physics CAE field by creating inter-disciplinary CAE software that integrates MFBD, Lubrication, Control, and Design Optimization, all in a single framework.

Function Bay Dynamics (I) Pvt. Ltd.
(Contact: B. Sridhar - 98110 68096)
301 Odeon Plaza, II Sector, 10, Dwaraka, New Delhi 110075

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Contact
Delhi : B. Sridhar - 98110 68096
Chennai : S. Nakkeeran - 98400 46560