सत्यमेव जयते
DSIR

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Ministry of Science & Technology

TECHNOPRENEUR PROMOTION PROGRAMME (TePP)

Creative INDIA

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TIFAC

Contents

Mechanical Engineering

Others

TePP: an orchestrated network of independent innovators

This is the tale of two networks , one a global R&D network working on cutting edge technology driving innovations to derive competitive edge in a crowded market. Another is people's network reusing existing stock of knowledge to find solutions to improve quality of life.

Theoretical framework

Kathleen Allen gave an overview of two schools of thought that dominate network theory: *cohesion or cluster theorists* and *structural hole or brokerage theorists*. Cohesion theorists propose that densely embedded networks with many connections are more beneficial because they are closed. Dense networks of direct ties appear to foster the development of shared norms, routines and the trust necessary for the sharing of proprietary information.

Structural hole theorists, by contrast, posit that networks are open social structures where advantages derive from brokerage opportunities across structural holes that create valuable social capital. Social capital has been viewed as the "contextual complement" to human capital. Therefore, organizations with management and collaborative networks that bridge structural holes in their markets tend to learn faster and are more creative, increasing the probability for invention and innovation to occur. More recently, research has suggested that large networks of indirect ties and many structural holes is a way for members to benefit from network size without incurring the cost of network maintenance as would be the case with direct ties. Indirect ties, then, produce greater efficiency and they also allow for diversity. These weak ties bring network members in contact with others less well known, which increases the resource pool.

Global R&D networks

Study by World Bank Institute on India in Knowledge economy highlighted the trend towards greater integration of Indian R&D with global networks. The report states that India has been taking bold steps to strengthen its R&D infrastructure, developing technological innovations and altering the mind set of its people toward better creation, acquisition and use of technology.

Three drivers are identified:

- Global orientation of RTI/ CSIR labs
- Hybrid model of ICT
- MNC R&D centers

Dualism in Indian approach

Kirsten Bound researcher at Demos (2007), in her report `*India: the uneven* innovator' highlights the globalization of Indian located R&D efforts stating that Global networks and flows of Indians are a crucial component of India's science and innovation story. They are taking advantage of globalisation at precisely the moment when they can have the biggest impact on India's economic dynamism. Leading companies in sectors such as pharmaceuticals are moving to business models based on innovation, often exploiting global connections and flows of people. The climate and infrastructure for innovation is improving, with more venture capital and incubators.

Kirsten also draws attention to dualism in Indian approach .In India, the debates about the role of science in social development started with the *Swedeshi* (indigenous) movement of 1904 with modernizers such as Nehru placing impeccable faith in the power of modern science to solve problems of poverty and superstition while traditionalists like Gandhi argued for bottom-up science for everyday needs. Both, big science and small co-exist today in various forms and debate over how Indian science could serve the nation continues to this day.

India is an ancient civilization and historical baggage comes with romantic notions of simple contended agrarian society. Indian history of human suffering cannot be different from others, where majority lived wretched lives in the silence of poverty. Only during the last 200 years or so, progress and prosperity touched the lives of more than ten percent of the population in economies like Europe, US, Japan and few others. Degrading poverty is still India's chief challenge about 400 million people live on less than $1 a day. Indian government's 11th plan approach paper aptly titled` *Towards faster and more inclusive growth*' recognizes this reality when it states that the Indian economy on the eve of the 11th Plan is in a much stronger position than it was a few years ago. While this performance reflects the strength of the economy in many areas, it is also true that large parts of our population are still to experience a decisive improvement in their standard of living. The percentage of the population below the poverty line is declining, but only at a modest pace. Far too many people still lack access to basic services such as health, education, clean drinking water and sanitation facilities without which they cannot be empowered to claim their share in the benefits of growth. These problems are more severe in some states than in others, and in general they are especially severe in rural areas.

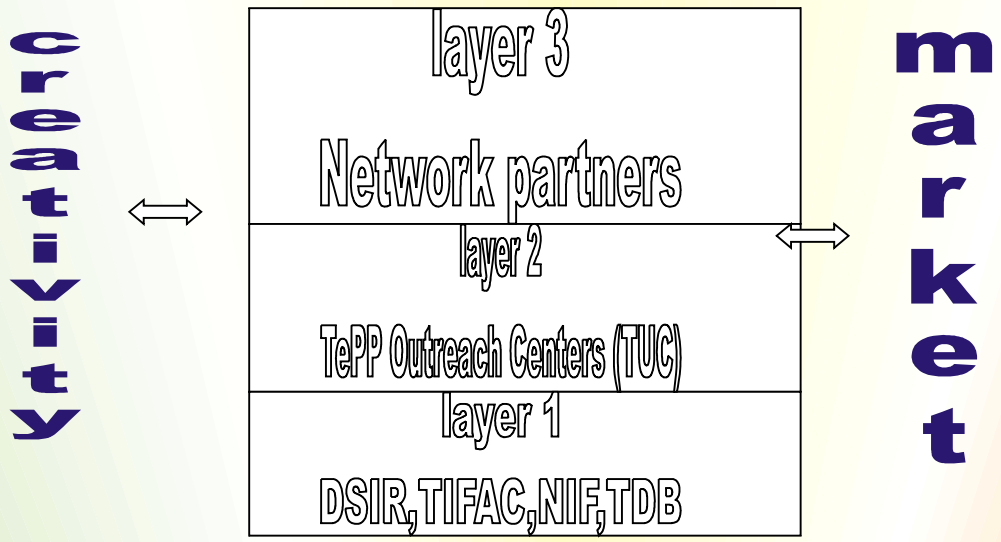
India is a populous country transiting from an agrarian economy into a globalized economy and development instead of measuring by reach of mobiles needs to be seen as a learning process. Technological innovation is not simply a matter of installing devices, but of transforming society and its value systems.

TePP Network

Networks have become a critical factor in a successful new venture launch. They serve as information conduits; they provide access to resources; and they offer legitimacy to overcome the liabilities of newness and smallness. Consequently, new venture success depends in large part on the entrepreneur's ability to construct a network of supportive relationships. In particular, social networks are the primary way that entrepreneurs tap the angel investor market because angels are particularly difficult to identify and reach. It has been suggested that entrepreneurs overcome the liabilities of newness and smallness by participating in large, robust networks that are also diverse.

TePP has constructed Innovator Network to provide mentoring support to independent innovators all across the country. The network has government departments (DSIR &DST), autonomous society (TIFAC), large number of outreach centers and larger number of Technology Angels providing technological, managerial and entrepreneurial guidance adding value to the grants provided by the Government of India to the independent innovators of the country. Trust is the protocol of this network - trust creates and reinforces mutual obligation and cooperation.

TePP Network



Idea **TePP Network** **Market**

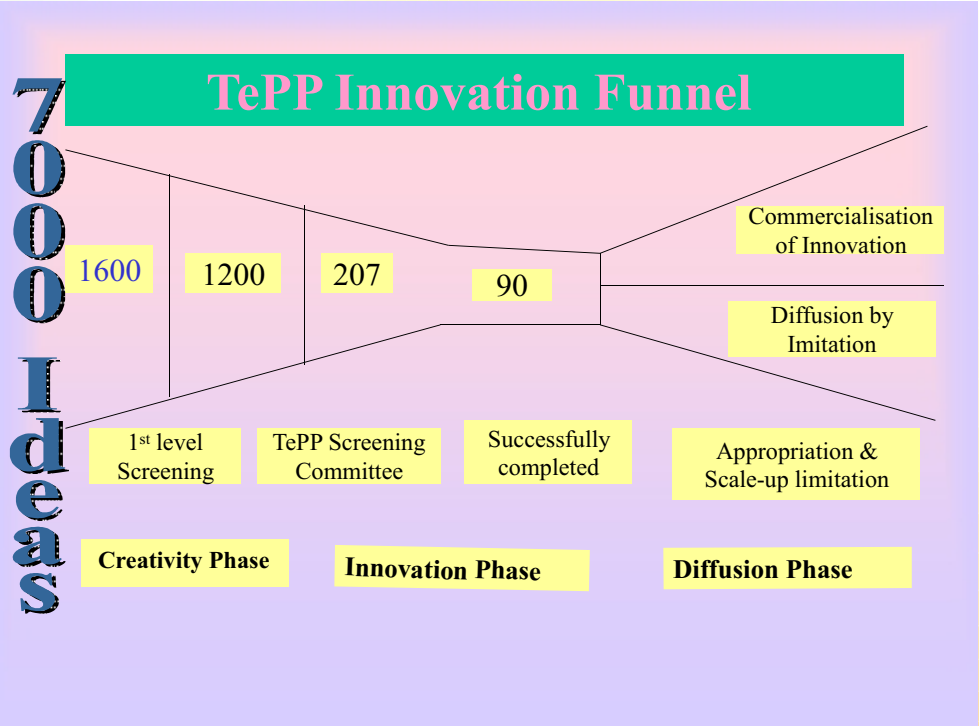
TePP Network is the facilitating zone between *Ideation phase* to *Market acceptance*. The network provides counseling, mentoring, technical guidance and funds to incubate the innovation in first phase and incubate the start-up enterprise in second phase. Different layers structure the relationship TePP has with partner institutes. TePP initially started funding engineered prototyping of significant innovations of grass root innovators, scouted, documented and mentored by GIAN (Gujarat Grassroots innovations Augmentation Network) mentored by Prof Anil Gupta of IIM, Ahmedabad. Later, independent innovators other than grass root innovators were taken for support and with passage of time, the need has been felt to move on parallel tracks. Starting with this current financial year, it was decided that NIF would take care of grass root innovators while TePP would look after the interests of formally educated (matriculates) innovators. TePP and NIF continue to work closely learning from each other. The other important organization under Ministry of Science & Technology is TDB which if funding incubators. The incubators have found it beneficial to leverage TePP grant as pre-incubation support.

A major decision was taken to convert TePP into a network program drawing in the strengths of twenty partner institutes to start with. TePP outreach centers (TUC) apart from making the program accessible to innovators add tremendous value. Each of the TUC is active in promoting innovation and entrepreneurship in their region and many of them run incubators. STEP, Trichy is the oldest STEP promoted by DST with UNIDO, SINE the other TUC has the best record as incubator, IIT Kanpur runs SIDBI incubator, BHU has rich tradition of entrepreneurship training, IIT Kharagpur has the fastest growth in entrepreneurship programs, FITT, Delhi transformed its incubating firms with radical business plans, incubators in private universities, PSG , VIT, JSS add dynamism, science focused TUCs at ANU, CGCRI and industry centric TUCs ERDC, Technopark make the network a formidable one.

Realizing there are many more players actively involved in promoting entrepreneurship and supporting innovators, TePP has forged networking relationship with these stakeholders like RIN, NABARD, Media Asia, NID, self help groups in layer three. It is an ongoing activity and TePP hopes to work closely with every stake holder.

A program is live when its interfaces are breathing and TePP has an engaging relationship with both the creativity interface and market interface. TePP is actively perusing establishment of a Creativity Institute in India and Innovation trade promotion council.

TePP Innovation Funnel



Source : TePP, 2007

TePP funnel gives a statistical overview of TePP process but TePP is not about numbers. It is about people, it is about creative people who have ventured to dream and live their dreams taking a torturous path of entrepreneurship. TePP salutes the spirit of Indian innovators and this small booklet is an attempt to capture the untold stories of simple innovators forming the base of Innovative India.

Agricultural Sciences

01. Banana Fibre Separator Machine

The innovator is a Mechanical Engineer from Tuticorin (Tamil Nadu)

The innovator has developed an innovative method to extract Banana fibre from Banana tree stem by developing a Banana Fibre Separator Machine. The banana fibre of silk quality produced by the Banana Fibre Separator Machine has good luster and is of superior quality, compared to the fibre produced by other machines available in the market, because of the innovative process involved.

Benefits
The machine can be used to produce 50 kg. of yarn and will consume around 500 nos. of banana tree stem which is treated as waste material otherwise. By using this waste material as raw material good quality banana fibre can be produced.

Patent
Patent application has been filed.

Status of Technology
A mini model of the Banana Silk Yarn Separator Machine has been developed.

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Network Partner
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02. Development of Groundnut digger cum separator machine for use in other applications

Groundnut digger cum separator machine developed by Md. Yusuf Khan of Rajasthan is a sturdy rugged desert unit which is used to dig and separate the left over groundnut pods from the soil which is otherwise done manually. The device works as an attachment to a 35HP (or more) tractor. As the tractor moves forward, the vanes rotate and dig into the ground, scoop and drop the soil-groundnut mixture into a vibrating storage unit with a sieve base. The system of linkages and drives vigorously vibrate the entire unit to shake the soil loose and the groundnuts stay trapped at the top in the central storage unit as the soil gets sifted out onto the ground. The device not only separates the pods but also prepares the land for the next crop.

This unique device was identified and recognized by National Innovation Foundation, Ahmedabad during its third National Competition on grassroots Innovation and was further supported by GIAN-North for business promotion.

GIAN-North also facilitated the transfer of Technology of this device to ARDEE Hi-Tech Pvt. Ltd., Visakhapatnam (A.P.) for further development for other applications which is undergoing at their works.

The end product resulting out of further development would be a Low cost machine for cleaning sea beaches. A key part of tourism is clean beaches which serves to attract travelers from India and abroad and which can generate a lot of employment and economic opportunities. By having economical beach cleaning machines, it is possible to maintain clean sea fronts. Such equipment has good potential in the export market too.

The potential customers for these machines are Municipalities, Hotels and resorts located on the sea front, private agencies which have been given beach maintenance contracts.

Innovator
Md. Yusuf Khan
C/o Yusuf Krishi yantra Udyog
Fatehpur Road (Opp. Hotel Paradise)
Sikar (Raj.)

Network Partner
GAIN-N, Jaipur

03. Device for Draining of Boiled Rice/Cereals

The device, having height of about 2 feet, consists of two parts. The inner part consists of semi circular ring having a pressing movable device that can be screwed tight to hold the vessel. Once the vessel is tightened in the inner movable ring, it can be locked to prevent its dislocation by locking it with a cross iron rod. After that, it can be tilted 450 to 600 for draining.

The working of device is easy and can be operated by any person. Apart from low cost, it has zero maintenance. The device has domestic application and may also find use in Hotel industry.

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04. Herbal formulation for the control of cotton pests

The product was tested on all the common pests of cotton like bollworm, aphids and mealy bug. The results showed complete control of all the pests. The field trials were also conducted in farmer's fields and hundreds of users given the very positive comments on the performance of the product.

Status of Technology

Commercialization started with SRISTI Innovations and NIRMAN (Company), Ahmedabad. The product is in the market and getting good response from the users as well as doing good business.

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Network Partner
SRISTI, Ahmedabad

05. Hybrid system for solar distillation and drying application

The idea of innovator is to develop a The applicant has this innovative idea for increasing utilization of “Solar Concentrators” for new applications like water distillation combining with solar drying process. The invention intends to utilize solar concentrators for generating steam and condensation of steam will result in distilled water that has commercial value. During condensation of steam the latent heat is released which is wasted in normal circumstances. Project envisages recycling or cascading use of heat content of high-pressure steam for multiple stages of evaporation and condensation of steam and use of latent heat of low-pressure steam for drying application.

End product like distilled water has market for consumption in all school-college laboratories, for use in automobile batteries, use in inverter batteries, UPS battery banks, pharmaceutical industry, food processing industry etc. Products from solar dryer have market as processed food product, dried/preserved vegetables and fruits for use in lean season, for mountaineering expeditions, high altitude military bases etc.

Innovator
The Innovator is a Professor
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06. Hydroponics Device Prototype

The idea is based on the principle of hydroponics, the growing of plants without soil. There are hydroponics device prototype, in which the focus is on growing the plants hydroponically and not much on harvesting the secretions of their roots. In the present case, the innovator has developed a prototype (a kitchen nutraceutical kit) using the "cater and garner model" (feed and harvest) offering health benefits through collection of root secretions with astounding nutraceutical values.

Benefit
The prototype constructed will help in probing the nature of rhizosecretions and experience their true nutraceutical values.

Status of Technology
The prototype has been made and is under trial.

Patent
It is yet to be patented.

Innovator
The innovator is a researcher and holds Ph.D. degree in Botany.

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Network Partner
TBI-UOM, Chennai

07. Integrated use of neem and sea algae in the eco-friendly management of crop pest

The product has a multiple role to play in agricultural crop management; firstly as pest repellent and secondary as nutrients. The organic synthetic insecticides are more hazardous to handle, not easily biodegradable, leave toxic residues in food products besides environmental pollution.

Novelty is in combining the technology for neem products and seaweed liquid fertilizers to develop a product with multiple desirable effects. They are biodegradable, non toxic; produce no ill effect to humans and animals. The technology is highly feasible and economical as the raw materials for the development of products are available easily in our country.

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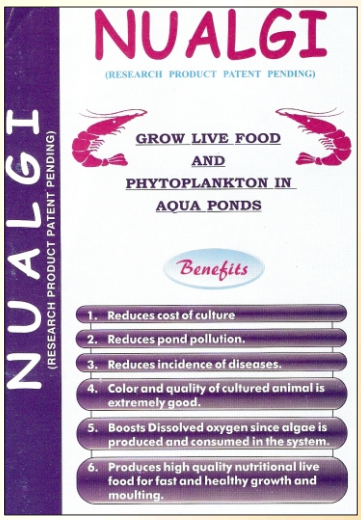
Network Partner
TREC-STEP, Trichy

08. NUALGI for growth of Diatom Algae



The innovator has developed a product called NUALGI which contains trace and special nutrients that is stable in water and in a chemically and biologically available form. Upon dosing to water it produces a large bloom of diatom algae and along with a little urea and DAP produces zooplankton and live food leading to the marine food chain. The diatom algal bloom is produced in any water, be it fresh, sea, sewage, polluted etc. The diatom algal bloom removes Carbon dioxide and produces Oxygen in large quantities by photosynthesis. The product is being sold commercially for fisheries and prawn culture.

Benefits

The product can be used for:

- fisheries and aquaculture to increase food production
- reduction of green house gases which ultimately reduces global warming
- treatment of lakes affected by Eutrophication
- treatment of sewage and effluents
- removal of toxic algal blooms of cyanobacteria etc.
- production of bio oil
- odour control

Patent

The patent application in India has been filed. The innovator is likely to file international patent application.

Status of Technology

Literature survey has been carried out and the innovator has developed the product after rigorous R&D work for more than 10 years.

Innovator
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Network Partner

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09. Prototype Model on Production of Manure and Methane Gas

The chemical fertilizers & pesticides are quite costly and unaffordable for farmers. Farmers are using fossil source, which are being imported. The methane gas to be produced in the project would be of high quality compared to the fuel obtained form fossil source. The project had set up the prototype model for the production of bioorganic manure & methane gas to replace the use of imported fossil fuel. The product would meet the requirement of cooking gas & fertilizers for public& agro sector. The project involved the design of three chambers to ensure adequate electron acceptors by aerobic digestion and to improve the productivity of methane gas by anaerobic digestion. The plant design engineering has been carried out by the promoter himself. The wood dust, hotel waste including human soil and fruit waste would be used as the feeding stock for production of methane gas. The actual production would begin by January 2008. The product would be environmentally friendly as there would be no discharge of pollutants.

Methane Gas Collection Tower

Main Reaction Reactor

Innovator

Shri R Selvearj is B.Sc. from Madras University and DCM & HDC from National Council for Co-Operation, Bangalore and New Delhi..He presently runs his own consultancy firm, Green Global Absorbents, Coimbatore, Tamil Nadu.

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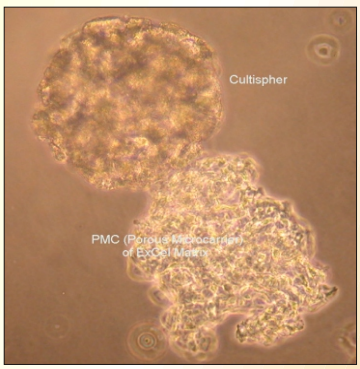
Biomedical & Herbals

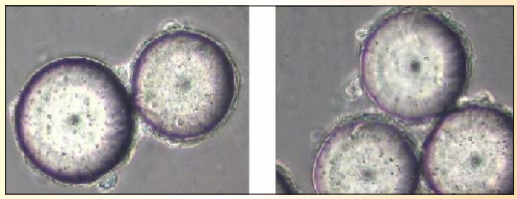
10. Development of indigenous micro-carriers for large scale cell culture



Porous Micro carriers cells

Micro carriers are made of biomaterials like cellulose, dextran, gelatin, inert synthetic polymers and ceramics like glass. In order to allow mammalian cells to adhere on the surface of the micro carrier, certain amount of positively charged chemical groups are attached on the surface. Animal cells being negatively charged in general tend to attach on the positively charged surface and spread over the rest of the surface.

In spite of the convenience and technical superiority over conventional methods of cell culture, micro carrier technology has never been adapted by Indian vaccine industry. The innovator has developed technology for cell culture that is amicable for large scale manufacturing of mammalian cell culture base biopharmaceutical in an economical and efficient manner.


Indigenous Micro carrier with culture

This allows high density culture of mammalian cell in conventional bioreactors without additional equipment. So the technology developed is an alternative to imported micro carrier using indigenous process and cheaper raw materials.

Innovator
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Network Partner
ANU, Guntur

11. Herbal formulations for wound healing in animals

The herbals formulation showed the effective results on the fast healing of superficial wounds in animals. It augments the recovery process and controls the infection.

Status of Technology
SRISTI, Ahmedabad transferred the technology to Matrix Bioscience Ltd, Hydrabad for manufacturing and marketing of the product globally.

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Network Partner
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12. Herbal formulation for treatment of Bloat and flatulence in animals

The product is an effective treatment for bloat and flatulence in animals. Recovery starts in 1.5 hours of administration of first dosage. Animals got complete cured in 24 hrs. Within 2-3 days, animal started feeding normally. No side effect was also observed

Status of Technology
SRISTI, Ahmedabad transferred the technology to Matrix Bioscience Ltd, Hydrabad. Matrix will do the manufacturing and marketing of the product globally.

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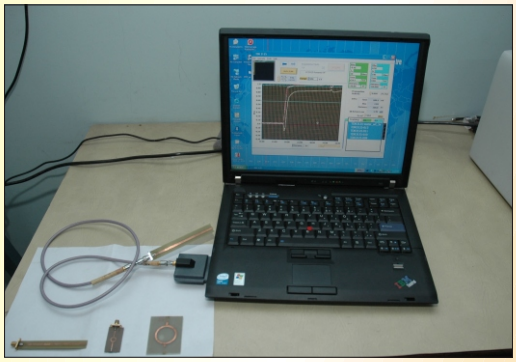
13. In Vivo Dielectric Measuring Instrument in Frequency range of 100 MHz to 5 GHz for detection of cancer



The Principle of the instrument is that microwaves interact strongly with water molecules. This interaction depends on the surrounding of the water molecule. The rotational relaxation time of water in normal cell is smaller than the value in cancerous cell.

A pulse with rise time of 1 ns is propagated through the microstrip transmission line. The transmission line can be kept in the mouth of the subject under test. The reflected pulse carries signature of the cell. The appropriate software have been developed to extract information about permittivity, conductivity and relaxation times etc which determine the diagnosis.

It is under test in collaboration with Tata Memorial Hospital Based on the test data the future strategy will be decided.

Innovator
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14. Life of Color Doppler / Ultrasound Probe increased by NDIA

The one of greatest invention of human for scanning the organs of the whole body is called ultrasound scanner or color Doppler in which the transducer or probe plays a major role of transmission / reception of ultrasound ways.

Due to the continuous use of transducer on the human skin, the life of the membrane gets worn out. This project has evolved the system of replacing the membrane of the defective probes and also enhancing the life of working probes by placing a glove over the membrane with out reducing the resolution of the image.

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15. Romantaque Aloe Vera Cream

The innovation is involved in the technology is to use plant derived extracts to inhibit the hair growth by stopping the follicle growth.

The formulation is applied to Normal Intact skin after hair removal by waxing/ plucking/ Epilation/ threading twice a day for a week. The formulation affects the structure of Follicle and stops the hair growth.

In the first round of patents she has filed patents with USPTO, and South Africa, UK, Australia through PCT route, apart from India. Due to resource constraints she has opted for the pursuing the patent examinations herself with necessary help on the legalities from the experts in the local jurisdictions. She has recently appeared for the Patent Agent Examination as well, to sharpen the tools.

Innovator

Mrinmayee Bhushan has been working on the Actives for last 8 years or so, on full time basis since last 5 years. Along with her husband Bhushan Vishwanath she has floated a private limited company to pursue various ideas that are being used by us on routine basis, however based on solid logic of Ayurveda and Indian belief system.

She is working on re-discovering the traditional knowledge using the modern medicine and scientific tools as a validation platform.

She is holding many ideas under the wraps till she takes this research on Hair Growth inhibition to the logical conclusion of commercial product. A few of the idea seeds include, Influencing Melanin production in skin, Plant origin Omega 3 Fatty Acids for nutraceutical market, Herbal powder for mouth bleeding in haemophilia patients.

Innovator
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Network Partner
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16. Worm Composting to treat medical waste

Photograph of pilot plant (Bio- reactor)

The worm composting as an alternative option, which is safe and environmental friendly technology to treat medical waste economically. For that it requires bioreactor. The mechanism of this bioreactor is based on aerobic system of biodegradation in a closed container duly incorporation of oxygen transfer, pH, moisture and temperature controlling arrangements. Organic medical waste is loaded from top and compost is released from bottom end. Worm and other microorganism are populated inside the vessel providing food and useful supports.

This mechanism helps to faster processing that has a profound effect on the levels of pathogens namely E.coli, Faecal Coliforms and Salmonella sp. with reductions of >99.9% possible. Material that is worm composted exhibits greater pathogen reduction than achieved with conventional composting. The obligate aerobes namely Pseudomonas sp., Zoogloea sp., Micrococcus sp. and Aebromobacter sp. have evolved to process nutrients and reproduce at the highest efficiency in aerobic conditions and so the pathogens are excluded from nutrients and space as the obligate aerobes continue to increase under ideal conditions.

A similar reduction in numbers exists for enteric viruses due to the lack of host species, exposure to a microbiologically active environment and the secretion of virucidal enzymes by the earthworms during the digestion process. An identical pattern is observed during the worm composting process when examining parasite (Helminth ova) numbers, primarily due to the lack of host organisms and possibly directs digestion by the earthworms.

It is important to understand that where potentially harmful organisms are in medical waste being composted, they should not be present in harmful numbers when the process is finished. End product needs to be tested to confirm its harmless condition.

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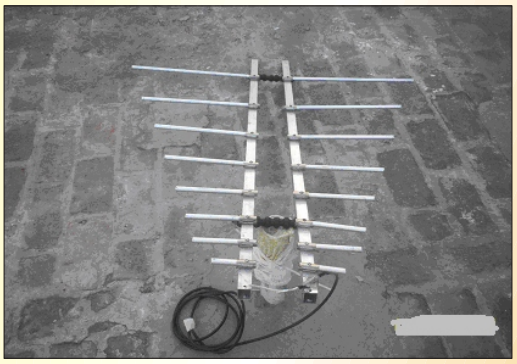
Network Partner
ERDA, Vadodara

Electrical Engineering/Electronics

17. Design and Development of single antenna for Doordarshan channels DD1 and DD2

Benefits



The idea of innovator is to develop a single Antenna for DD1 and DD2 channels of Doordarshan. Presently in order to receive the programmes one has to use a separate antenna for DD-1 and DD-2, which involves extra cost and effort. The reason of the present antennas not capable of receiving both the signals simultaneously is their bandwidth. These antennas have smaller bandwidth individually, which does not allow them to receive the signals on one antenna. With the help of the proposed antenna the antenna will be made broadband and the public will be able to receive both the channels simultaneously with one antenna provided the direction of the transmitter is in same direction for the channels.

Now more than 87 percent of population of the country receives Doordarshan programmes and it requires separate antenna for DD1 and DD2. The proposed Antenna will be sufficient for both the channels DD1 and DD2. The design is easy to implement, any laymen can assemble antenna also.

Innovator
The Innovator is an Engineer/Professor.
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ERDC-Hartron, Ambala Cantt.

18. Development of a STATCOM (P2 - STAT)

This innovation will be a major step in the field of Power Quality. The basic purpose of the innovation is to solve the problem of neutral overloading, one of the critical issues faced by the industry today.

In a 3-phase circuit, there are 3 active conductors, and a return conductor i.e. the neutral, which carries the triple-n harmonics which add up there and therefore significant currents flow in the neutral conductor. As many neutral conductors have been, in the past, half-sized, this situation can become critical, even when the phase conductors are operating well below full load.

Our aim is to compensate these triple n harmonics present in the neutral using the avant-garde Active filter technology of FACTS. This technology is based on a closed loop feedback system. In this we sense the neutral current which goes as an input to our device. In turn our device generates an equivalent current to compensate for this existing neutral current. This helps in eliminating the neutral current at the very beginning avoiding it to flow through the complete neutral wire to the transformer.

Patent

We are in the process of getting the above technology patented.

Innovator
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Network Partner
SRIC, IIT Kharagpur

19. Development of different variants for mobile

The proposal is to develop a mobile operated switch which is operated by cellular phone in which a configured number is stored. It is only through this configured phone number that the designated mobile phone connected to a switch which can be activated. When a call is activated to the cellular phone from the stored number, the phone sends a signal out to the electronic circuit which counts the no. of rings. The number of rings for switching ON or OFF the source is preset. The switch has many applications; this proposal is focused on irrigation pump operation for agriculture.

In north India, watering of crops mostly depends on irrigation pumps based tube wells. Electric supply is erratic and people have to work in night. This switch will be very useful for farmers for their pumps operation.

Benefits

Phone operated switch is an instrument with an attached mobile phone and electronic circuit, which can switch on/off any device remotely from any location under mobile coverage.

Only authorized users having the specific mobile number can operate the system. It can operate switches connected to any electronic/electrical appliances like irrigation pump, Water geezers *etc.* from far off places using GSM/CDMA network. No call charges are applicable.

Innovator

The Innovator is an ITI pass and serial Innovator.

Prem Singh (28) is a prolific innovator with more than one hundred fifty innovations to his name, some of which are; electronic robot, tea boiler, heartbeat amplifier, hand operated dynamo, water level indicator, *etc*.

Sh. **Prem Singh Saini**
C/o NIF, **Ahemdabad**.

Network Partner
NIF, Ahmedabad

20. Single-Degree of-Freedom Rate Table

The proposed prototype is intended to calibrate and test inertial sensor for its ability to measure the displacement of a missile due to inertia (acceleration & angular motion) in a single axis. The inertial sensors that are to be calibrated have application in extremely precise navigation in ship, submarines, projectile, etc. The sensors will be checked for its suitability by this prototype. The existing product is imported at a cost of Rs. 1 crore and estimated cost of prototype would come around 13 lakhs. The potential customers are ISRO, DRDO Hyderabad, IRDE Dehradun.

Innovator
Mr. **B.D Awasthi** (B.Tech Aerospace Eng.IIT K)
Village: Mahmoodpur
Fatehpur
Mo No.9415186296

Network Partner
SIIC, IIT Kanpur

Mechanical Engineering

21. Automatic ON/OFF Water Pump System.

This proposal is for development of Automatic ON/OFF Water Pump System. The device senses the inflow of water and switch ON the pump automatically. It also senses the level of overhead water tank and switch OFF the pump when overhead tank is full.

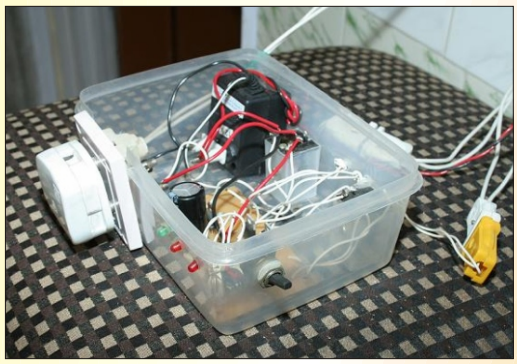
It is very useful for the area where water supply timing is very odd like 3;00a.m. in early morning for short duration. The similar products available in the market, sense the level of overhead tank while the proposed device senses the inflow of water along with tank level. It is also cost effective.

The project aims at complete automation for switching a water pump system. The general trend for switching a water pump is manual operation where water pump switch is operated manually, as per the requirement. The manual operations on water pump systems many times lead to inefficient and undesirable results. These manual operations lead to wastage of electric power and water. The ultimate solution to such undesirable and inefficient results is complete automation of water pump system. It comprises of three modules namely, water tracking sensor (Fig 1), water level sensor (Fig 2) and processing device (Fig 3). The water tracking sensor keeps a check on the incoming water supply. A water pump should run only when the water is available, otherwise it may lead to a great damage to water pump. Unnecessary running of water pump also leads to wastage of electric power. Therefore, water pump should be switched on only when water supply is on. The water level sensor keeps a check on the water level status in the water tank. Once the water boiler or water tank starts replenishing with water, the water pump is to be switched off at an appropriate time. The water pump system should be intelligent enough to check the water level or a threshold water level so as to furnish a signal to switch off the water pump. If water pump is not switched off at an appropriate time, then it may lead to wastage of water and electric power or may lead to undesirable results.

The processing device accepts signal from both the mentioned sensors and process them accordingly to switch on/off the water pump. Once both the sensors furnish signal either “One” or “Zero”, these signals are fed to processing device. Processing device processes both the signals and furnishes results accordingly. Ultimately, it is processing device that switches on/off the water pump, accordingly.

Automatic water pump on/off system is a commercially feasible product. It has many applications in the industry. Being a low cost product, it covers a whole range of market for its purchase.

In thermal power generation, the water is heated up to produce steam to rotate turbine. This steam is further sent to condenser to condense to water. This water is sent back to the boiler through water pump. Automated water pump on/off system is applicable to such a system.



Automated water pump on/off system automates the boiler-condenser water pump system, in thermal power plants.

Another instance of its application is to automate the water pump systems used to replenish large overhead water tanks (used for a complete locality or a small residential area). When the water supply from the Govt. or from the water supplying agencies, is delivered, then this water is collected in large overhead tanks built at a certain height. This water is delivered to different houses though water pipes. Water pump systems are used to replenish the large overhead water tanks with water, which is further used in different houses. These water pumps are switched on/off manually when the water supply comes. The project automates this system, too.

It can suffice big industrial applications to a common man needs and can also make Government of India as its vendor. In addition to the industry use it can be a very useful product to Delhi Jal Board. If this product is installed at every home, in Delhi, then at least 20% of water can be saved by Delhi Jal Board.

Innovator
The Innovator is an Engineering student.
Sh. **Anupam Attri**
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Thaper Institute of Engg. & Technology
Patiala -

Network Partner
ERDC-Hartron, Ambala Cantt.

22. Autonomous Unmanned Aerial Vehicle for Aerial Surveillance

We are developing small segment Unmanned Aerial Vehicle (under 15 Kg weight category) suitable for multifarious applications. The UAV would be capable of autonomous flight (here implying, autonomous waypoint navigation aided by GPS and INS) and carries onboard CCD (charge coupled device) imaging payload which gathers video data, streaming to Ground Control Station in real time for operator to see terrain over which aircraft is flying. GCS (Ground Control Station) consists of a wireless antenna interfaced with a laptop running Flight Control software. Way point navigation can be programmed using this software from the ground station by operator, making possible for the UAV to follow a specified path at a specified altitude and cruise speed.

Such a system is of paramount importance for our country; its applications spanning Civil, Defence, Environmental, Meteorological applications and Homeland security tasks. Some of the direct benefactors/customers of such a system in India are Survey Department, Geosciences Department, remote Sensing Institute, Police department, forest department, Irrigation department, Agricultural Research Institute (Crop Monitoring), Municipal Corporations(traffic management), Petroleum Companies (pipe line monitoring), Coast Guards (coastal surveillance) etc.

The proposed prototype autopilot, wireless radio frequency control unit with flight control software & input devices & sensors. This is having 80 inch wing span & can go up to 10,000 feet & has range of 10 mile radius up to 180 miles

At present there is no Indian company that is manufacturing unmanned aerial vehicles so this has enormous defence, security & civilian applications like pipeline monitoring, serial border surveys and disaster management

Innovator
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Network Partner
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23. Development of Walnut Cracker Machine

The innovation is a motorized machine that cracks the walnuts automatically such that its useful fruit is separated easily which is otherwise done manually. The machine has a hopper as a feed-in section, a grading section, two rollers rotating in counter direction and the outlet. The walnuts to be cracked are placed in a hopper and are screened automatically such that similar allowable size is passes through the rollers below the grading unit and the other sizes separated out. The operator can select the grading size and also the spacing between the rollers can be adjusted to match the size of the walnuts.

There are several Walnut Processing units in Kashmir, where the walnut is cracked and the walnut seed obtained for further processing. At almost all such Walnut Processing units, the Walnut is cracked manually, using human labour. As per a secondary data source, on an average, a human labour can crack 15 kgs. of Walnut in an hour.

The machine is cracks on the average about 110 kgs. of Walnuts per hour, thereby providing a working substitute equivalent to seven human Labourers. After taking into consideration the consumption of electricity and the wear and tear of the machine, this machine is a working substitute of FIVE human labours. It is note worthy that by increasing the length of the rollers, the throughput of the machine can easily be increased many folds.

Benefits

It is a motorised machine that will crack the walnuts automatically such that its useful fruit could be separated easily which is otherwise done manually. The machine would have a hopper as a feed-in section, a grading section, two rollers rotating in counter direction and the outlet. The walnuts to be cracked are placed in the hopper such as to pass through the rollers below the hopper. The grading of the walnuts may be done initially using a separate grading machine or the mechanism may also be incorporated into the device. The spacing between the rollers can be adjusted to match the size of the walnuts. The walnuts passing through the rollers gets cracked and fruit gets separated and collected from the outlet.

Walnut cultivation and trading is among the major source of income of J&K. Mustaq Ahmed Dar is engaged in this activity for the past several years and he noticed that if the trading of walnut is done without the skin it gives him more value but the process is cumbersome and involve too much labour. It gave him idea to have a device that would crake the walnuts and he began the development. After working for about six months with his limited resources he could develop a crude prototype which is now under further development with support from TePP through GIAN-North and NIF. The Entrepreneurship Development Cell of the University of Kashmir has also extended infrastructural support for carrying out this development.

Innovator
The Innovator is a farmer.
Md. **Mustaq Ahmed Dar**
Anantnag (J&K)

Network Partner
GAIN-North, Jaipur

24 Digital Talk Friend (DTF) Speed Warning and Limiting Device (SWALD)

The proposal is to develop a speed warning and limiting device (SWALD) for vehicles. SWALD is a unique device that is an attempt to solve this problem of over speeding while at the same time trying to find acceptability by transport operators, in terms of its feature, cost etc. SWALD warns the driver and passengers by beep sounds and audible instruction like, **"Your Attention Please! This Vehicle is Speeding Up!"** in case the vehicle travels above the set limit. This will continue until the speed comes to normal. Even after receiving the audible warning and alarm, if the driver is crazy enough to speed up the vehicle, the device activates the actuator to cut the acceleration to 50% to get back the set speed limit, within a short time.

Contemporary speed governors available in the market works by the signals related to the engine R.P.M., which kills the engine power. In case of transport vehicles climbing up on inclines and/ or with heavy load, limiting the engine power is not at all practical and desirable. The proposed device allows the vehicle to get maximum power while travelling up in an incline, without compromising on the speed.

Innovator
The Innovator is an Entrepreneur.
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Network Partner
ANU, Guntur

25. Hi-Fi Digitalized Turning Machine

The Innovator want to make a working prototype of low cost Digitized System for mechanical machine movements. Although advanced computer numerical control (CNC) machines exist for machining precision parts, a vast number of mechanical parts are still machined by hand. In new, the axes all have individual control joystick for clearing and setting each specific measurement value. The analog touch switches read button-press from the user. The LCD display is used to show text to the user creating a large bright interface. In this project is propose, the HI-FI Digitalized turning machine (hi-fi DT), the automatic as well as manual operating turning machine, so that it can partially, like semi CNC machine.

This machine is far economical to other Digital Read out (DRO) machines. A less skilled person can operate it. This project proposed Digital readouts on full size machine tools with far economy. This Digitalized turning machine (hi-fi DT) makes the life of a machinist much simpler, to the modern machine shop

Innovator
The Innovator is an Engineer.
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Tamil Nadu.

Network Partner
TREC-STEP, Trichy

26. Intelligent Ground Vehicle

The idea of innovator is to develop a fully autonomous vehicle having its own artificial vision so that it could maneuver the traffic following traffic rules. It will automatically search for the shortest and safest path to reach its destination. It will be free from human errors and will be able to work under any terrain or any climatic condition. Major research work will be done in its path planning, artificial intelligence and its machine vision so as to make it totally risk free vehicle.

The proposed vehicle is for participation in an international event. TePP support to the proposal will help in the diffusion of TePP Programme to international community. This concept will be helpful in automobile industry, defense and running public transportation.

Benefits
An attempt is being made to develop a state-of-art unmanned vehicle that has its own artificial intelligence and can maneuver its path as per the obstructions or the hurdles met by it while navigating through urban traffic. The potential users can be the military for border patrolling or movement of ammunitions and supplies.

Innovator
The Innovator is an Engineering (Mechanical) student.
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Network Partner
FITT, IIT Delhi

27. Natural Air Cooler

In the present cooler, the atmospheric dry air is sucked by the electrical motor fan between the porous water bags. The sucked air gets cooled due to coldness of the water bag cold surfaces (approx 25^0-27^0 C) and also humidified due to evaporation over the water bag surfaces. The cold humidified air is blown into the room. The electrical motor pump supplies the water from the tank. The electrical consumption is around 130-140 watts.

Benefit

The cooler can be used as air cooler, transport cabin cooler, central air conditioning unit and also as heat exchangers. It also aimed at in controlling humidity to low levels (50 -60%).

Status of Technology

The prototype has been made and is being further modified to meet BIS standards.

Patent

The patent application has been filed (564/MAS/2002).

Innovator

The innovator is a diploma in mechanical engineering and presently working in Indian Air Force.

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Network Partner

TBI- Univesity of Madras, Chennai

28. Precision tool for Liner Calibration

The idea of innovator is to develop a Precision tool for Liner calibration. This is basically an instrument to be used for liner calibration for main engine/aux. engine on board the ships assisting them to get a clear picture of wear out liner, present radius & direction which is worn the most unlike the present measuring equipment it will judge the condition with radius values & hence will be more accurate to show the present condition of liner respective of dia of liner this equipment could be used on various size liner thus cutting inventory.

The idea of liner calibration tool basically measures the radius of liner with taking centre point of liner into consideration. It has benefit like: easier, safe method and more accurate measurement.

Precision tool for liner calibration

The project is basically an instrument to be used for liner calibration for main engine/aux. Engine on board the ships assisting them to get a clear picture of wear out liner, present radius & direction which is worn the most unlike the present measuring equipment it will judge the condition with radius values & hence will be more accurate to show the present condition of liner respective to dia of liner this equipment could be used on various size liner thus cutting inventory cost.

Innovator
The Innovator is an Engineer
Sh. **Gaurav Goel**
20 B, Inderpuri
Ambala Cantt.-133001

Network Partner
ERDC-Hartron, Ambala Cantt.

Others

A Multipurpose Watch,

http://www.uselwatch.com

With the development of civilization, the necessity of measurement in certain fields of life which can be expressed in physical units was felt. Some of them are length, weight, time, temperature etc. measurement of time is very important and essential in day to day life of every individual. At present, the time is measured by a device i.e. a machine known as watch / clock which is based on rotation of Earth. Most of the watches / clocks are made on 12 hours scale.

A new clock invented at the start of 21st century with a different concept altogether making a long jump in time measurement. The watch denotes:

- Rotation of Earth on its own axis in 24 hours (a Solar day)
- Revolution of Earth around Sun in 365'242190 days (a Solar year)
- Revolution of Moon around Earth in 29.530589 days (a Lunar month)
- Revolution of Moon around Earth 12 times in 354.367055 days (a Lunar year)

The clock is broadly divided in three zones as given below:.

- **Inner zone (The Time zone)**
  - Parent Country on 24 Hr Scale including Metric Hours
  - Other Foreign Countries with a provision for correction of time & summer time.
- **Central zone (The Calendar zone)**
  - Solar Calendar
  - Lunar Calendar
- **Peripheral zone (The Zodiac zone)**
  - 12 Zodiac signs
  - 27 Nakshatras including *Abhijit* Nakshatra
  - 108 Charans
  - 360 Degrees
  - Provision for both *sayana* as well as *nirayana* system

The present innovation is development of a clock which works according to nature and measures time in a scientific manner. The clock shows both rotation as well as revolution of earth along with revolution of moon. The said clock denotes more than 50 parameters, which are of great importance to human beings in their day-to-day life. Some of them are:

By Sun (Hour) Hand

- Scientific measurement of time on 24 hrs. time scale.
- Conversion of present time in metric system of time i.e. 100 seconds=1minute, 100 minutes=1 hour and 100 hours= 1 day.
- Hour hand always indicates the position of Sun in dome shaped sky at meridian time.
- Early/late sunrise and early/ late sunset. Thus, indicates longer and shorter day/night.

By Rotating Earth Disc and Time Zone Ring

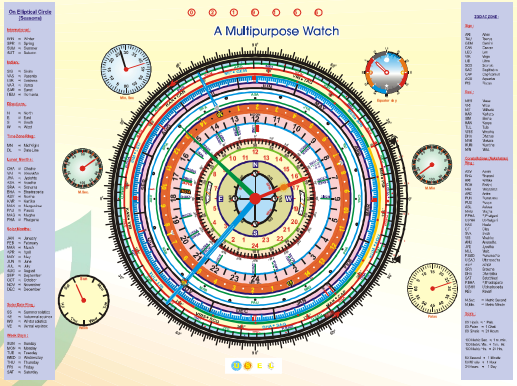
- Time of more than 30/40 desired countries/cities at a time with time difference (+) or (-) amongst countries.
- GMT i.e. Universal time.
- Places on Earth having mid noon and mid night with date change at any time of the day

By Moon Hand and its revolving ring

- Different phases of moon including New Moon, Full Moon, first and last Quarter Moon.
- Start and end of lunar dates (tithis).
- Helps in family planning to women in reproductive age.

By Lunar Hand

- Desired one or more lunar years as a whole with Lunar months.



By Earth Hand

- Desired one or more solar years as a whole
- Day, date, month and year of Gregorian calendar.
- Dates having summer/winter solstice and vernal / autumnal equinox.
- Seasons including Indian seasons with their duration.
- Earth•s slant towards Sun at the end of solar months.
- Position of sun from equator.
- Dates of personal importance like birthday, anniversary.
- Angular distance of earth from first point of Aries.

By Zodiac

- Position of Sun (Earth) and Moon in zodiac in a particular rashi, nakshatra, charan & degree.
- Birth sign (Lagan), lunar sign and solar sign at birth time
- Zodiac in required system *sayana* or *nirayana*.
- *Panchhak* period by presence of moon in last two signs.

By Associate watches

- Metric minutes and metric seconds.
- Name of week days.
- Time in *Ghatis* and *Palas*
- Digital days watch shows record of memorable events upto one million days.
- Equator watch shows AM/PM, Day/Night, Duration of *prahar* and *chaugharia* at equator of Earth.

Other Provisions

- The solar year according to Gregorian calendar. Other solar calendars can be printed accordingly if required with their months and dates.
- The lunar year according to Vikram Samvat. Other lunar years can be printed accordingly with their months and dates.
- Solstices/equinoxes and seasons are according to northern hemisphere. They should be changed accordingly for southern hemisphere.
- Early/late sun rise and early/late sun set time shown in 24 hours time scale ring of parent country is different at different latitudes. So it should be printed accordingly at required latitude by an individual.
- Name of any required country, zone, city or local place at its time meridian can be printed on rotating disc according to personal necessity.
- Red dots marked in *Charan* ring helps to know the position of rising sign (*rasi*) in east at a particular latitude. Thus helpful to know the *lagan* in horoscope at birth time of an individual.

Patent

925/Del/2004; PCT/IN2005/000165; WO 2005/116780 A1
National Phase Patent Applications filed in Europe & Japan

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30. Accurate Level Indicator

The Innovator want to make a working prototype of low cost Accurate Level Indicator. This is to check the horizontal and vertical level on the basis of gravitation.

Its application is in civil construction work and in manufacturing of machine and equipments. It is low cost, easy to use and accurate level indicator. Its proposed cost is around Rs. 20/-, which is very much affordable for civil construction people.

Innovator

The innovator is a blacksmith entrepreneur.

Sh**. S. Bhaskar**,
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Batla Gundu-624202 (T N)

31. ClimaGear

ClimaGear is a jacket that heats or cools the user depending on his need. The jacket uses thermoelectrics with a novel heat sink design. The novelty of the heat sink is that it is not bulky and suitable to be used in apparel.

Innovator

Kranthi Kiran Vistakula is 27 years old male born and raised in Hyderabad, AP. For the past 6 years he lived in US. Before returning to India he was pursuing his master's in Mechanical engineering at Massachusetts Institute of Technology, Boston. He is currently working in his startup Dama Apparel Technologies, which is developing technical apparel.

He was the innovator of heating/cooling apparel that won many awards. Additionally he was innovator of power skin, a protein network that is used to harvest energy, which was funded by NASA.

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Network Partner
SINE, IIT Bombay

32. Design and Development of temperature indicating chalks

In varieties of industries like petroleum refineries, textile, casting, forging and fabrication industries, it is necessary to measure the surface temperature of the metal or objects. For the purpose, a variety of instruments are used. Most economical and convenient method is by using thermal crayon/chalks.

In the present innovation, the technology has been conceived, designed, developed and commercialized for temperature indicating crayons/chalks in the range of 350^0 to 1200^0C.

A mark of the crayon is made on the surface of the object where temperature has to be measured. The mark would melt and indicate glossy appearance as soon as the surface reaches the rated temperature of the mark. These crayons are very sensitive to temperature and made to melt within + 1% of their rated temperature.

Innovator

Owner of a self start-up company, M/s VPL Chemical Pvt. Ltd.

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Network Partner
Karnataka State Science & Technology Council, Bangalore

33. Designing a low cost Yoghurt making machine

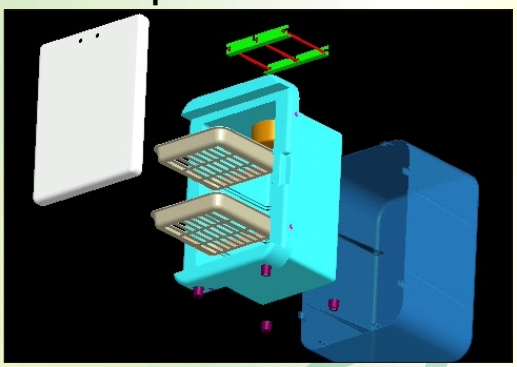
Yoghurt is a fermented functional dairy product using specific probiotic bacterial cultures, *Streptococcus thermophilus* and *Lactobacillus bulgaricus*.It enjoys a unique status of delicacy together with its proven therapeutic and anticarcinaogenic bio-properties. However making Yoghurt at home is not possible, as the bacterial cultures used are thermophilic, i.e., they grow optimally only at **42 C.** Available commercial incubator in the market which can serve the purpose, is grossly huge, labour intensive and non-portable. Hence considering the valuable health benefits conferred by Yoghurt on the end users, specifically infants, convalescents and the geriatrics , the proposed equipment was fabricated, so that, the bio capsule shall be made available at all homes and even small entrepreneurs, who wish to commercialize the product. The equipment is fully automatic, with no manual interventions, simple and user friendly with automatic thermo cut-of and more so, portable.

Benefits

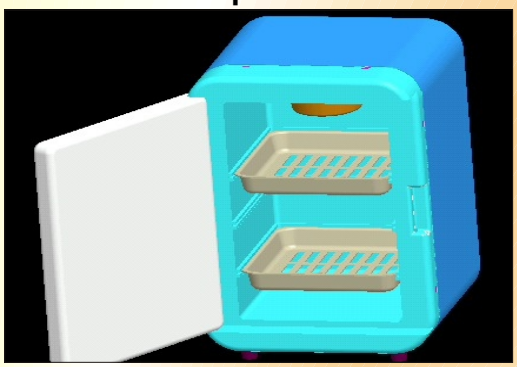
Portable and Automatic
Facilitates Yoghurt consumption at homes
Useful for small scale entrepreneurs for commercial production of Yoghurt

Features of the prototype:

Exploded View



Open View



Chamber size (Dimensions) 18 (L) x 12 (B) x 8 (H)
FRP (Fiber Reinforced Plastic) cabinet, double walled with PUF as insulating material
Air circulated through using a mini blower
Fitted with a door operated lamp for illumination
All controls protected from spillage
220 V. single Phase, 50 Hz AC supply
Cost less than Rs. 10,000/-

Innovator

Dr. **R. Palani Dorai**, M.V.Sc, Ph.D
Associate Professor, Department of Dairy Science
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34. Development of low Cost high performance LED Based illumination system for rural and tribal Areas

This system can be adapted to various sources of electrical energy available in the area. Sealed lead acid batteries provide more capacity in les space although heavier in weight . They are appropriate for stationary use with a typical life span of 2-5 years. They may be recycled .LEDs produce more light per watt then do flament bulbs. They may be battery powered and consume less amount of energy.

Innovator
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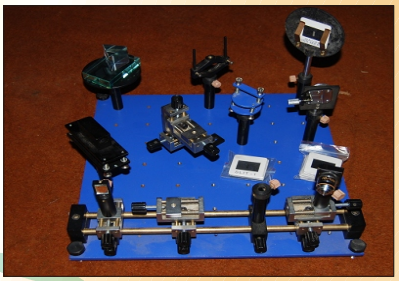
Network Partner
SIIC, IIT Kanpur

35. Development of optical experiment (LASER) module for school level labs.



The proposed proposal is to develop an integrated module to demonstrate interference, diffraction, reflection and refraction experiments using LASER as source. The mentioned experiments are difficult to demonstrate using White Light as source. Practical kit available in the market use White light as source. It will be a low cost module. Nearly, 11 experiments High School to M.Sc. level can be demonstrated by using different accessories in this LASER module. The present optics experiments needs large size benches and mounts, illumination systems and requires separate benches and experimental set up for each experiment, whereas proposed module can demonstrate all optical experiments very easily and effectively.

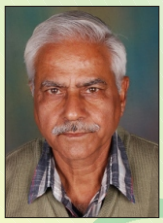
As you know that it is very difficult to observe and demonstrate the properties of light and optical phenomenon through the optical instrumentation experiments utilizing conventional light sources like Thermal, fluorescence and discharge of arc. This is due to white light as white light is combination of thousand of wavelengths of various color light i.e Blue To Red. It is impossible to demonstrate properties of light by white light as it has thousand of wave length and when we focus this light at a point It focuses according to wave lengths thus due to presence of thousands waves, it focus in a broad region and we received a weak concentration at a point as all wave focuses at different points. These kinds of properties create difficulties in optics experimentation. To over come this difficulty, the white light sources have been replaced by the laser light (LIGHT AMPLIFICATION OF STIMULATED EMISSION OF RADIATION) due to its properties of monochromatic, unidirectional and coherence. The kit has been develop to observe the optical properties, phenomenon and

very well can demonstrate effectively all kind of optical experiments of reflection, refraction, interference and diffraction with help of good quality stable diode lasers. There are numerous types of lasers available commercially like Gas, solid state and semiconductor lasers. In this module we have used semiconductor diode laser, which has got advantage of lightweight and low cost per unit of power. Although it is not as coherent as other lasers but its compactness and low cost has given a good chance to develop a laser based teaching kit for the beginners at school and inter-college level at a highly affordable price. It can't give the same versatility of experimentation as a He-Ne Gas laser but it gives a very good qualitative view of this optical phenomenon.

Benefits

The experiments possible with the kit.

- Directionality of laser beam.
- Experiment on Rectilinear propagation of light.
  i) Reflection Phenomenon
  ii) Refraction from Prism
- Single Slit experiment.
- Double slit & Multiple Slit Experiment.
- Diffraction Grating Experiment.
- Experiment with Tapered Slit.
- Experiment with Mesh Pattern.
- Airy Pattern/Pin hole experiment.
- Experiment with Bi-Prism.
- Launching of laser light in optical fiber.



Innovator
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36. Development of PC based Oscilloscope

This proposal is for development of PC based Oscilloscope (PC Scope) consisting of hardware and software. This PC Scope will be developed to replace current Oscilloscopes in the laboratory, Colleges and other Technical Institutes. The PC Scope will be a system that will accurately display and operate as a physical Oscilloscope using a PC. With a Software version of the Oscilloscope, it will be possible to eliminate the Redundancies and burdens of Physical Oscilloscope.

Photo of 10x Probe with Voltage protection for Wave Display 1.0

Signal Gneerator using Microcontroller

The purpose of the PC Scope project is to construct several tools that will assist labs, other areas in observing and measuring the signals. The tools developed will conform to the acceptable frequency requirement in Electronic Labs. These testing devices will be constructed based on these frequency standards. An embedded system will control and transmit the results, which are collected and analyzed. The signals are viewed using PC Scope an oscilloscope designed. The tools created will simplify and reduce the cost required for an Oscilloscope. This Software tool will also help in the process of verifying different Electronic Hardware and assemblies such as Television, Radio, and Communication equipment, Computers etc.

The product will be cheap as we compare to hardware oscilloscope, which is currently ranging from Rs12, 000 to lakhs. But PC SCOPE would cost within the range of **Rs 500**. The low cost PC based oscilloscope will have very domestic demand. It can be sold to colleges, institutes, R&D labs, Professional electronics industries and service agencies. The product has worldwide demand and export market

Benefits

The project involves development of Graphical User Interface (GUI) front end and signal acquisition Hardware. The signal to be observed is continuously sampled and transferred to the PC for display using GUI. In the first phase of the project, the Oscilloscope (Wave Display 1.0) implementation uses sound card of the PC and achieves a Bandwidth of 20Khz. We have developed a probe which can plug into Microphone jack of the PC. The probe has circuitry for selection of 10X or 1X and also voltage protection. The kit consists of probe, software CD, user and installation manuals. The kit costs approximately Rs 200 compared with an standalone Oscilloscope which costs around Rs 10,000. We are presently working on improving the bandwidth of the Oscilloscope.

Waveform Displayed on PC Screen

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37. High Speed Wireless Sensor Data Acquisition System

This is a proposal to develop wireless sensors as at present the sensors are networked or wired, here the applicant is attempting to develop a wireless sensor to eliminate the difficulty of topology & location At present no Indian company is manufacturing high speed wireless data acquisition systems that too in a cost effective manner. This has huge application in transport, automobile, CNC machines, Energy Meter. The applicant is attempting to develop it at one third costs

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38. Intelligent LP Gas Detector (IGD)

The “intelligent LP Gas Detector: is safety product for LP gas users and has been expected to have a huge vertical market. IGD module can be easily incorporated over the existing LPG gas with a high preset-able sensitive rang (500-10,000ppm). It gives alarm in first stage safety when ppm level of the LP gas crosses the first threshold, if the LP gas crosses the second threshold point than IGD switch's out the gas flow totally through the supply system. The main innovation stands in the power supply for the operational circuitry. The circuit is passive one and it generates it power from the gas flow and rate of change of flow though a propeller module. In normal mode it stays in sleep mode until the sensor gets activated. The total module is fire insulated. This system can give the metering of flow rate and total flow of the gas which give an added value to the innovation.

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39. Laboratory scale process development of Environment friendly printing ink

Conventional lithographic printing inks are derived from petroleum sources and contain hydrocarbon solvents which evaporate during drying.. These inks are washed from printing press using hydrocarbon solvents (eg. kerosene). These hydrocarbon solvents lead to emission of volatile organic compounds (VOCs) causing pollution in printing industry. Vegetable oil- based environment friendly inks contain unsaturated drying oils, which polymerize in presence of atmospheric oxygen leading to drying. These inks can also be washed with mild alkali solution. Thus it leads to almost zero VOC emission.

The innovator has developed Vegetable oil- based environment friendly inks containing unsaturated drying oils, which polymerise in presence of atmospheric oxygen leading to drying. These inks can also be washed with mild alkali solution. Thus it leads to almost zero VOC emission.
The process of making vegetable oil based inks is free of the emission of Volatile Organic Compounds thus causing no ill effect on human health. The mildly basic wash solution for vegetable oil based inks reduces operating costs in comparison to the conventional inks. Complete product range of all four colours is ready for marketing. Pilot scale facility is being set up.

Benefits

- Drying and washing of these inks is free of the emission of volatile organic compounds
- Rising crude prices put pressure on the costs of raw materials used in conventional inks making vegetable oil based inks economically attractive
- The mildly basic wash solution for vegetable oil based inks reduces operating costs involved with costly hydrocarbon based wash solutions used with conventional inks

Status of Technology

- Complete product range (all four colours) has been developed
- Test marketing for all the four colours in progress
- Pliot Scale facility (scale ~ 100 kg ink / day) is being set-up

Patent

- **Application for Indian patent filed**

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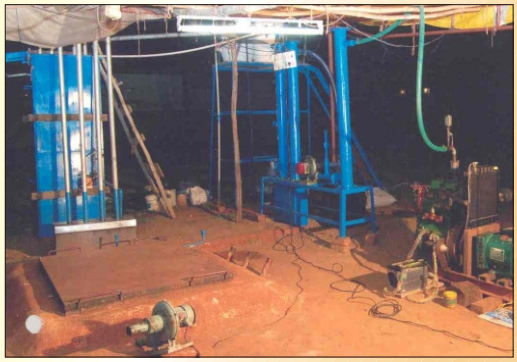
40. Low cost power from Biomass

The invention is to convert biomass into charcoal and power. The CO_2 and H_2O, the bye-product of wood combustion, when passes through hot bed of charcoal at 800^0C, get largely converted to CO and H_2 which are combustible gasses and are used as fuel. It is a kiln type model which is different from existing gasifiers. In the existing gasifire power is produced on burning biomass and get finally ash and power. In the kiln model, the biomass is converted into charcoal and power.

Thus 40% charcoal and 60% combustible gas are obtained. Every 1000 Kg of wood gives 99% combustible gasses and 1% ash. By using 3 Kg of wood, we get 2 KW electricity and 1 KG of charcoal. The charcoal can be sold at Rs 5 per Kg.



The cost of wood gas so liberated is very cheap and can be used for firing furnaces and in internal combustion engine for generating electricity.

Innovator

The Innovator is PUC with 10 years experience in biomass gasification process.

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41. Reconfigurable UAV

The proposed work is reconfigurable UAV. It will have capacity to fly autonomously. In case of any damage to UAV due to gun battle of anything the embedded algorithm will detect the failures and try to recover the UAV so that it can fly. Many technologies go into the making of a UAV. Some new technologies developed are to be filed for patent.

This technology will enable Indian defence to have UAV which can be sent to the enemy terrain and being small in size is less likely to be hit by gun. Even if shot there will be good chances of recovery until unless some major damage has taken place.
The path planning method developed can ensure the flying of UAV even through streets in an optimal path. Processing starts from image the city and the roads are automatically identified and path panning done.

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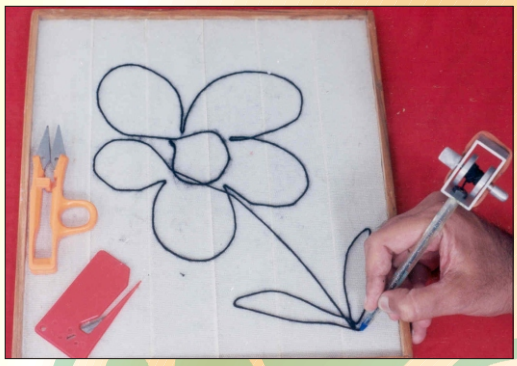
42. Sketching device for use by a visually challenged person



Inspired & motivated from son Nikunj, having visual Impairment by birth, self along with husband purely in personal capacity as parents of a visually challenged child, invented this unique educational aid for creating graphics, sketches, letters which can be explained to Blind children.

The development of sketching pen device -An innovative teaching aid for visually challenged (VC) children, is the right step forward in the direction of providing "Drawing stimulus" for creativity and providing an educational aid to visually challenged (VC) children. This innovative tactile device is developed for the first time in the world, having potential Export features. The device has great potential educational utility for the Blind; also it serves as essential communication link between the sighted and visually impaired persons. This feature greatly helps in the Integrated Education program, where stress is laid on providing education to blind children in normal schools along with sighted children.

This sketching device can address two distinct marketing segments, one specific to the education and communication media for the blind persons, Other segment addresses this device for use by all the sighted children, as a hobby tool in creating graphics and sketches using different colours of acrylic/woolen threads on the hook & loop media.

It consists of a board fitted with hook & loop Nylon fabric (velcro) strips, & a pen with thread inside it which will enable the child to make meaningful pictures which he can touch, feel and thus understand concepts. The thread delivery is maintained through the spool having smooth rotation arrangement about an axle fixed at the upper part of the pen body. Keeping continuous touch with the Velcro surface, the child can start drawing different figures, Sketches, letters in mother tongue, Graphical symbols, etc. The same can be erased by simply pulling out the thread from the surface of the slate. This serves very convenient for the blind person for making multiple reuse of the device. The sketching device has remarkable feature of "Draw as you think" compared to the so far available tactile devices where "embossing" of the graphical entities is carried out on the reverse side of paper, sheet metal etc. to get "Mirror Image " of the actual profile. This also overcomes shortcomings of Braille.

Status of Technology

This project is presently supported under the auspices of CIIE-IIMA Ahmedabad with the active support from TIFAC-DST - Delhi

Patent

The device is patented for India,USA and granted PCT for EU, receiving WIPO gold Medal & NRDC award.

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Network Partner
Centre for Innovation, Inaubation & Enterprises (CIIE), IIM Ahmedabad

43. Sustainable and Emergency Mobile Charger

The innovations is a sustainable and emergency mobile charger that a user can carry with him/her.

The charger charges a cell phone battery by human activity on the charger. The user can charge his/her phone by either winding a small foldable handle on the charger or by rolling a wheel on a surface.

The charger is innovative in that that the modes of using the charger are multiple allowing the user more ways in which he/she can use the device, offering much greater flexibility and convenience to the user.

Patent

We are currently finalizing the patent drafts for the innovation.

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44. Trolley with jack for disabled persons

Trolley with Jack has been designed to help the Disabled to lift the heavy objects up to 40 kgs and take the same to desired place thus helping them in their day to day activities.

Trolley with Jack has been designed to help the disabled /handicapped persons in their day to day activities thus raising their self confidence and self esteem by reducing dependence on others. This machine will help in lifting and moving heavy objects like Gas Cylinders, Water Buckets, Sewing machines, Flowerpots etc. Moreover this machine can be used to generate employment opportunities for the disabled persons

Status of Technology

It is under Clinical and Technical trials at IIT, Delhi

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Innovator / Innovation Index

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2.	Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) B/H, Pharmacy College Mess, Boys Hostel Campus, Near Vijay Char Rasta, Navrangpura, **Ahmedabad** 380 009 Website : www.sristi.org	Prof. Anil K. Gupta President
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8.	Go-Vigyan Anusandhan Kendra Kamdhenu Bhavan, Pt. Baccharaj Vyas Square Chitar Oli, Mahal, **Nagpur** 440 002 (Maharashtra) Tel. : 0712-772273, 734182 E-mail : info@govigyan.com, govigyan@hotmail.com Website : www.govigyan.com	Shri Sunil Mansingka Coordinator

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Ministry of Science & Technology
Technopreneur Promotion Programme(TePP)

TePP Outreach Centres

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5.	Electronics Research Development & Facilities Centre(ERDC)-HARTRON GT Road, Near IOC Depot **Ambala Cantt.** 133 001 (Punjab) Tel. : 0171-2610418, 2610496 E-mail : pkgoelerdc@gmail.com, dskajal_hartron@yahoo.co.in	Shri P.K. Goel Project Manager/ Shri D.S. Kajal, Senior Technical Manager
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Technology Angels on MOST Panel (TePP)

Technology Angels on MOST Panel (TePP)

Several technology experts have evinced keen interest to offer their services to independent innovators of India. To facilitate a closer bonding, Ministry of Science & Technology is maintaining a panel of `Technology Angels' (TA), list of experts that signed Non Disclosure Agreement is as under.

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