भाकृअनुप-राष्ट्रीय प्राकृतिक रेशा अभियांत्रिकी एवं प्रौद्योगिकी संस्थान
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Technology No. 1

Sisal Leaf Fibre Extractor

Background:

There have been continued efforts to develop an efficient machine for extraction of fibre from green sisal leaves. The available extractors are associated with lesser output as because the entire length of the leaf cannot be processed in the machine. Moreover, the operator has to drag the leaf backward resulting human drudgery and fatigue. Accordingly, design and development of an extractor with the provision of an easy mechanism wherein the green leaves can be processed with the elimination of back-ward dragging and also higher yield of fibre from the whole length of green leaf is the need of the hour.

Technology Details:

The present invention relates to a sisal leaf fibre extractor. More particularly, the present invention is directed to provide a machine for extraction of fibre from the entire length of the green sisal leaf after collection of the green leaves from the field. The extractor device according to the present invention consists of a feeding platform and a beating roller. Importantly also, as there is the provision of clamping of green leaves on feeding platform &cam arrangement to detach the beaten leaves backwards, back-ward dragging of the processed leaves by manual force is completely avoided. The beating roller is made of horizontal bars with blunt edges and is driven by a 2 HP single-phase electric motor. Green sisal leaves are clamped manually on the feed platform and the leaves are driven forward towards the beating roller. Once the beating operation is over for the entire length of green sisal leaves, the cam arrangement helps in detaching the beaten leaves from the roller and it automatically dragged backwards over the feed platform. The operating person de-clamps the beaten leaf and then washes it in plain water in room temperature and then dries it under sun to get sisal fibre. The highlighting feature of the extractor is that the entire length of the green leaf can be processed for getting the fibre and manual dragging is not required for the removal of debris adhered to the surface of beaten leaves.

Technology No. 2

Manufacture Of High Value Products From Yak Fibre

Background:

The yak plays an important role in the life and living of Indian tribes found in the difficult terrains of Himalayas. Yak animal offers meat, milk, hair (fibre) and leather. Two types of fibres, namely the coarser and fine fibres are harvested once in a year by manual shearing and cutting process. Subsequently, fibres are separated out manually. A yak can produce 500 – 1500 g of coarser and 250- 750 g of finer fibres per year. Coarser fibre of length 9 - 21 cm is mainly used in rope and tent making. The yak fibres are available with natural colours, mainly black and brown. Coarser black colour yak fibre presently does not utilized for value added end applications including textile, except its usage in the form of rope and tents. This is possibly due to its higher stiffness, slippery surface and difficulty in dyeing. Jute/yak fibres blended yarn of count 275 tex was produced from the untreated black colour coarser yak hair and jute fibres with jute to yak fibres blend ratio of 75:25 and 50:50 in jute spinning system. Beyond 50%, it was not possible to introduce yak fibre in blended yarn.

Technology Details:

It was observed that in the blended yarn, containing more than 50% untreated yak fibre, was not possible to spin. It was due to instability and slippage of the jute/yak fibres blended sliver due to low co-efficient of friction (0.28) of untreated yak fibre. On the other hand, after fibre surface modification 75% yak fibre was possible to blend with 25% jute fibre to produce 25/75 jute/yak fibres blended yarn. All the jute/yak fibres blended yarns with blend ratio of 75:25, 50:50, 25:75 can be used for fabric and products making. Similarly, plain weave jute/fine yak fibres blended textile (weft: yak/jute/viscose (75/10/15), warp: polyester yarn)) were also developed. Fine yak fibre could be blended with jute and regenerated viscose fibres. From the coarser fibre products like Jacket, Blazer, Long coat, and file & folder were developed. Similarly fine fibre was used to make suiting fabric and shawl.

Technology No. 3

Banana Pseudostem Fibre Extractor

Background:

Extraction of fibre from banana pseudostem is gaining attention day by day. The pseudostem is formed by closely packed leaf sheaths embedded in the growing tip. The manual process of extraction of fibre from this pseudostem is vey tedious and time consuming. It also damages a large quantity of fibre. Thus for the improvement upon the productivity and quality of the fibre, mechanical extraction is the need of the hour.

Technology Details:

The present innovation (extractor)with two beating rollers and a debris removal rollereliminates the human drudgery as back-ward dragging is not required to get the desired function of extraction. The quality of the fibre in terms of uniformity is better than that of manually extracted fibre and also production increases manifold.

Technology No. 4

Pineapple Leaf Fibre Extractor

Background:

India is one of the major producers of pine apple fruit and its cultivation is mostly spread across different eastern & north eastern states. After harvesting the fruit, green leaves are thrown away which contains valuable natural fibre. The process of extraction of this valuable fibre is of great importance since the quality as well as quantity is strongly influenced by the method of extraction employed.

Technology Details:

With the present innovation (extractor), fibre can be extracted from the entire length of the green leaves. Moreover, three (03) leaves can be processed at a single pass thus enhancing the production capacity over the existing manual process where, green leaves are repeatedly scrapped over its surface with a broken china plate/sea-shell to remove traces of green matter.

Technology No. 5

NINFET-Jute Leaf Drink

Background:

Jute (Corchorus sp.), is a commercial crop grown for yielding the “Golden fibre” and conventionally appreciated in industries for making sacks, coarse clothes and diversified products. Despite of its wide acclaimed functional applications jute has dwindled its identity for gaining significance in commercial diaspora. Income from jute fibre has attained the stagnation point and needs further motivation for the cultivation of jute. Therefore, harnessing jute biomass for alternate application is the need of the hour.

Technology Details:

The utilization of huge jute leaf biomass (approx. 4-6 t/ha, on green weight basis) has opened a new vista towards increasing farmers income from jute cultivation. Jute leaf, a popular vegetable to many countries, contains good amount of antioxidants, minerals, vitamins and protein has been exploited for preparation an enriched herbal beverage. It is apprehended that jute leaf drink constituting large group of organic components would lead to an alternative to the traditional available beverages to the consumers. Major population consuming tea has developed it as a habit, subsequently may contribute in the growth of the jute leaf drink market.

Technology No. 6

Jute Activated Carbon (NINFET-JAC) as low-cost clean-up agent

Background:

The analysis of pesticide residues in agricultural and food commodities often suffers from matrix effects, leading to inaccurate estimation of residues. A clean-up step is therefore necessary not only to remove the co-extracted, matrix-derived compounds but also minimise the effects on signal enhancement or suppression of a target pesticide. Among various forms of adsorptive carbons, a commonly used petroleum-derived one is graphitised carbon black (GCB). Nevertheless, as this petroleum-based carbon is high-priced, developing a low-cost carbon clean up agent is highly warranted. Further, there is no information on any sorts of carbon developed from jute stick biomass/ agro-residue for pesticide residue analysis in food commodities.

Technology Details:

The 'golden fibre' of jute (Corchorus sp.) is largely cultivated in many Asian countries including India, Bangladesh, Pakistan, among many others. Around 4 MT of jute stick is generated every year in India, posing disposal challenges for the jute growers. As a natural and an abundant by-product of the jute cultivation system, jute activated carbon (JAC) could be a low-cost clean-up agent as opposed to petroleum-based ones, although its potential has never been folded in food testing.

Technology No. 7

Automatic Electronic Fibre Bundle Strength Tester for Multiple Fibre

Background:

Natural fibres are not graded properly and all qualities of produce are sold in one common lot. Thus farmers producing better qualities are not assured of a better price. Besides, the chain of middle man in agricultural market is so large that the share of the farmers is reduced substantially. In order to prevent such type of deprivation it was a crying need to develop a set of instruments especially for jute, ramie, sisal, sunhemp and flax fibres growers to be used for finding the correct grade of the fibre, as the price of the products depends upon the grades of the fibre.:

Technology Details:

Important contributions have been made by NINFET in the domain of instrumentation in relation to grading for jute, ramie, sisal, sunhemp and flax fibres. The instruments Automatic Electronic Fibre Bundle Strength Tester, which are now being used for accurate measurement and testing of strength, an important parameter for quality assessment of the fibre and thereby preventing deprivation of the farmers from getting their proper dues.

Technology No. 8

Digital Fineness Meter for Multiple Fibres

Background:

The main problem is to measure the fibre fineness where a widely variety fibre parameters are present using a system which will be least dependent upon the operating staff and environmental

variables but automatically convert and compute results that will be produced digitally within a very short span of time.

Technology Details:

The whole process will be controlled by a central processing unit using computerized micro controller. This multifunctional controller will first run a small motor to produce the airflow through the sample under test. The controller in turn measures the pressure difference of the orifice plate using sensitive sensors. These sensors will provide their results which will be compared and computed in the controller unit to produce results. These result will be shown digitally on LCD display instantly.

Technology No. 9

Digital Colour Lustre Meter for Multiple Fibres

Background:

To compare the colour & lustre of jute and others natural fibres with respect of the absolute value of white and to present the result in digital form. A low cost instrument for measuring the colour and lustre of jute and allied fibre has been developed by NINFET almost two decade ago using the principal of reflectance photometer, which can measure the brightness and lustre of the fibre sample in terms of diffused and secular reflectance using photo electric cell. But this method is not sufficiently accurate as here the illumination of light source and parameters of the output from the light sensor are manually adjustable, and thus the method provides a probable source of error:

Technology Details:

To combat the problem, types of instrument have been developed. There is provided a system for colour and/or lustre based lingo-cellulosic fibre grading comprising a light source for illuminating the fibre sample surface to be tested; sensor to detect reflection from the fibre sample surface a computing unit operatively connected to convert the said detected reflection to its equivalent whiteness value for grading of the fibre sample according to the computed colour and/or lustre.

Technology No. 10

Thermal Insulation Value Tester

Background:

The thermal insulation property of textile materials is considerable practical importance, particularly when these materials are used in clothing, winter garments, blanket, quilt, carpet, floor coverings, room insulation etc. Nowadays jute and others natural fibres is used to produce various products either by weaving and knitting and/or by nonwoven technologies. Hard boards from jute stick particles, dust and sticks of other plants of allied fibres are also very much under production. The resistance offered by a textile material to the movement of heat through it, is obviously of critical importance to its comfort. A suitable instrument for measuring the thermal resistance or insulation value of the products is very much essential need of the day. There is no single instrument available so far. An instrument, which can accommodate both thick and thin textile materials and non-textile sheet like products, may need to meet the demand of the present day. In view of the above the

instrument has been developed for quick assessment of TIV properties of textile and non-textile materials.

Technology Details:

In this instrument, the thermal resistance of the material is determined by using two-disc method, an application of Lee's disc apparatus tp textiles. Following internationally accepted standards, guarded two plate method has been employed to develop the instrument. The instrument can be used for the products having the thickness of wider range and under the more relaxed atmospheric control.

Technology No. 11

Electronic Fibre Bundle Strength Tester for Jute (Semi-Auto)

Background:

For measuring bundle strength of jute & allied fibres, Bundle Strength Testing Instrument is used, which has been developed by ICAR-NINFET and accepted by Bureau of Indian Standards. The instrument is controlled by hand so the human errors are there. To eliminate the human error totally an electronic automated instrument has been developed with the aim to replace the manual system with automatic system. The instrument is more precise, very simple, easy to operate and maintain.

Technology Details:

The conventional instrument for jute fibre bundle strength tester has been modified and fabricated by introducing motorized constant loading system and digital representation of data. In this way possibility of human error in the testing method has been eliminated and also the testing time become less. In addition to breaking strength it can display the tenacity/quality index value, time to break and breaking extension (elongation). Moreover it can store the results in the built-in memory unit of the instrument, which can be down loaded in a computer at later stage in Excel format using USB interface.

Minimum Rate of License fees and Royalty :

Sl. No.	Name of the Technologies	Sale price of the Machines	Propose License fees	Propose Royalty
1.	Sisal Leaf Fibre Extractor	Rs. 1,50,000/- + (18% GST)	Rs. 40,000/- + (18% GST)	5% on net sales value plus applicable taxes
2.	Manufacture Of High Value Products From Yak Fibre	**Sale price may be decided by the Licensee**	Rs. 20,000/- + (18% GST)	5% on net sales value plus applicable taxes
3.	Banana Pseudostem Fibre Extractor	Rs. 1,30,000/- + (18% GST)	Rs. 30,000/- + (18% GST)	5% on net sales value plus applicable taxes
4.	Pineapple Leaf Fibre Extractor	Rs. 1,40,000/- + (18% GST)	Rs. 30,000/- + (18% GST)	5% on net sales value plus applicable taxes
5.	Jute Leaf Drink (JLD)	**Sale price may be decided by the Licensee**	Rs. 40,000/- + (18% GST)	5% for initial 3 years and 10% for 4th and 5th year plus applicable taxes
6.	Jute Stick Activated Carbon (JAC)	**Sale price may be decided by the Licensee**	Rs. 40,000/- + (18% GST)	5% for initial 3 years and 10% for 4th and 5th year plus applicable taxes
7.	Automatic Electronic Fibre Bundle Strength Tester for Multiple Fibre	Rs. 1,80,000/- + (18% GST)	Rs. 50,000/- + (18% GST)	5% for initial 3 years and 10% for 4th and 5th year plus applicable taxes
8.	Digital Fineness Meter for Multiple Fibres	Rs. 1,15,000/- + (18% GST)		5% for initial 3 years and 10% for 4th and 5th year plus applicable taxes
9.	Digital Colour Lustre Meter for Multiple Fibres	Rs. 85,000/- + (18% GST)		5% for initial 3 years and 10% for 4th and 5th year plus applicable taxes
10.	Thermal Insulation Value Tester	Rs. 1,20,000/- + (18% GST)		5% for initial 3 years and 10% for 4th and 5th year plus applicable taxes
11.	Electronic Fibre Bundle Strength Tester for Jute (Semi-Auto)	Rs. 95,000/- + (18% GST)		5% for initial 3 years and 10% for 4th and 5th year plus applicable taxes

Note:

This EOI is an invitation to receive responses from prospective parties in keeping with the terms and conditions expressed herein. ICAR-NINFET is not bound to accept any of the EOI responses received and reserves the right to cancel this EoI at any time, and for any reason.

ICAR-NINFET will consider all EOI responses received and may enter into further discussions with parties which satisfy the requirements of this EoI in order to determine eligibility for the offer. Failure by a party to provide information that is essential in the evaluation of this EOI may result in rejection of that party's EoI.

For further information, contact us at: 033-24212115/16/17 or email: director.ninfet@icar.gov.in , nirjaftdirectorcell13@gmail.com, nirjaftitmu@gmail.com ; Find out more about ICAR-NINFET on our website: www.nirjaft.res.in

Submission of EOI

Interested companies should submit their **EOI** in a sealed envelope labelled **'TECHNOLOGY NAME"**, addressing the **"DIRECTOR"**, which should be delivered to ICAR-NINFET's office located at **12, Regent Park, Kolkata-700040, West Bengal** with following detailed information of respective parties

1. Company name and address
2. Company profile/ history
3. Legal status (limited liability, sole proprietorship, partnership etc.)
4. Company contact information
5. Copy of certificate of incorporation
6. An outline proposal for functional modality to execute the work