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Welcoming New Employees

2021 April JAPAN TAPPI JOURNAL
Vol.75, No.4 Abstracts

Introduction of Paper Feeder

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Tail threading systems and equipment has been developed over the years to be able to automatically thread the tail wherever an open draw occurred from one section to the next section of the machine. Some eighty years ago the rope threading system was introduced to thread the dryer section, calender and reel. Approximately sixty years ago the vacuum belt was introduced for threading systems at the dry end. The airfoil application was developed by Crown Zellerbach fifty some years ago.

The core parts of the paper feeding system introduced here are made in-house by utilizing the process know-how and skills accumulated over many years in the Japanese paper industry. This combination has succeeded in the epoch making improvement of tail handling system for whole parts of paper machine.

Latest pulping system for waste paper
- Continuous detrash system -

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There have recently been substantial changes on the domestic recycle paper supplies in Japan, following the import restrictions of the used materials in China. It is expected to continue the tendency of such difficult procurement of the good quality recycle papers, which would lead to increase the use of un-sorted recycle papers.

To adapt these changes, we need to recommend the upgrade of the stock preparation processes for proper handling. On this paper we would like to introduce the latest technology of the recycle paper pulping system (continuous detrash system) based on an actual case study.

Improved Sizing and Machine Efficiency Using a Novel, Simplified Approach

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Sizing is a critical specification for paper grades across a wide range of industry segments, providing important liquid resistance to the manufactured paper or paperboard. Despite innovations that have occurred over the last few decades, there is still a need to enhance sizing performance and machine efficiency while reducing chemical requirements and minimizing program complexity. To address these needs, this paper outlines the development of a unique alkenyl succinic anhydride (ASA)-based sizing offering which provides best-in-class size performance while simultaneously reducing shipping & inventory logistics. This new technology enables the papermaker to maximize the efficiency of their sizing program while minimizing overall chemical use and simplifying the storage and handling of related size chemistries.

Operating Experience of Surface Coated Dryer Cylinder at PM9

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PM9 at the Niigata Mill started commercial operation in September 2008, and is producing mainly A3 coated paper as a wide, high-speed, and light weight papermaking machine. Taking advantage of this wide and high-speed process, PM9 continues to grow with the goal of being a machine with high productivity and cost competitiveness.

Twelve years have passed since the commercial operation of PM9 started, and due to the aged deterioration of equipment, operation and quality issues have come to occur. Among them, the deterioration of the surface of the dryer cylinder caused a decrease in operation efficiency and product quality. In 2017 and 2018, the surface coating of the dryer cylinder was applied for two periods. In this paper, the operating experience before and after the dryer surface coating is introduced.

Process audit for Stock Preparation System

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The service of audit for Stock Preparation System provides several benefit to optimize the condition of system and machine. After condition check is done, a report is provided which include the result of investigation and recommended counter action depends on priority. The merit of this audit is to clarify the cause of problem not only from single machine but also from whole process of system, and it enables to minimize necessary counter action and its workload and maximize the performance of counter action. The service of audit is also useful for planning of maintenance and it enhances more stable operation without troubles. This service is available for the system with several type of raw material and also for each single machines.

Analysis of Factors Causing the Increase in Paper Strength Agent dosage in Summer

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The annual amount of paper strength agent in the paperboard machine has been significantly fluctuating in recent years. In particular, the volume of paper strength agent increases in the summer season. Consequently, the total cost goes up while making the corrugated boxboard.

In this report, we analyzed the factors related to the variable dosage, focusing on three viewpoints such as material strength, sheet formation and wet-end in A factory. Although the material strength was not affected, the paper strength decreased due to the worse wet-end condition and sheet formation when the dosage of paper strength agent rose. It was found that the main root causes were the decrease in efficiency of chemical additives following the deterioration of the wet-end conditions and the worse sheet formation caused by the rapid de-watering.

Report on the Results of the Fiscal 2020 Follow-up Survey on" JPA's Commited Action Plan for a Low Carbon Society" and Related Information on Measures against Global Warming in the Japanese Paper Industry

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Japan Paper Association

The Japan Paper Association (JPA) established its "Voluntary Action Plan on Environment" in 1997, in response to The Japan Business Federation's call to the Japanese business community to organize "The Voluntary Action Plan on Environment". Since then, JPA has carried out a follow-up survey and published the results every year.

As the Voluntary Action Plan finished in fiscal 2012, JPA newly started "the Action Plans towards a Low Carbon Society" and has been actively addressing global warming prevention in order to achieve the following targets set in the plan:

- Compared to BAU scenario(based on specific CO_2 emission rate of 2005), reduce fossil energy-derived CO_2 emissions by 1.39 million tons by fiscal 2020 .
- In view of securing forest resources and increasing forest carbon sink, expand forest plantation areas owned or managed by the paper industry at home and abroad to 700 thousand hectares by fiscal 2020.

According to the results of the fiscal 2020 follow-up survey (actual results for fiscal 2019), fossil-energy derived CO_2 emissions in fiscal 2019 was 16.58 million tons, a 4.9% reduction compared to the fiscal 2018(17.42 million tons). Compared to BAU scenario, fossil energy-derived CO_2 emissions were reduced by 3.81 million tons, achieving the target of 1.39 million tons reduction by fiscal 2020.

This is attributed to each manufacturer's active efforts including energy saving and energy conversion from fossil energy to non-fossil energy such as biomass energy.

In addition to the results of the follow-up survey, this report introduces the current energy situation in the Japanese paper industry, outline of the next phase of JPA's Action Plan for Low Carbon Society spanning the ten-year period from fiscal 2021 through 2030 and the latest information of countermeasures against global warming.

An Essay on Methodology for Innovating *"JAPAN TAPPI JOURNAL"*
Part 10: The Reason for Existence of Paper as viewed from Contemporary Philosophy

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From the birth of ancient Greek philosophy to the present, "existence" or "raison d'être" keeps the position of significant major topics in philosophy.

The tenth article of this series is intended to analyze the meaning of existence of paper mainly along with the post-war French philosophical traditions. The overall contents are described as below.

1. Introduction
2. Existence and birth of paper
3. Genealogy of contemporary philosophy and understanding of paper
4. Paper media capable of remaining the evidence of human process of thought
5. The reason of existence of paper in the digital era
6. The essential areas indispensable of paper in human life
7. The trend of contemporary philosophy and new focuses on "intelligence of object"
8. Epilogue

Revolutions in the history of civilization induced by paper
Part 3: The Clay Tablets That Inscribed the History of Mesopotamia

Kiyoaki Iida

Sumerian in Mesopotamia began to use clay tablets for recording their cuneiform letters in the age earlier than 3000 B.C. The clay tablets were used until the third century B.C. when the Orient and the Mediterranean regions became integrated, and papyri and parchments took over them.

The successive dynasties in Mesopotamia consistently recorded their histories in clay tablets with their cuneiform letters, and kept them in libraries and storage houses. When libraries were destroyed and burnt down, clay tablets were incinerated and remained in ruins. Since 1800, they have been excavated, which is more than half a million pieces in number. With those lots of remains, their letters have now been deciphered and their societies and cultures are being unraveled.

In about 3000 B.C., the recorded in clay tablets were administrative documents and vocabulary texts, which suggests that dynasties administrated with letters. In around 2600 B.C., transactions of estates and houses were recorded, and literal texts such as epics and tales appeared. In about 2300 B.C. sealed documents and letters were inscribed. In 2000 B.C. legal systems were in order. In 500-1000 years after they got letters and recording medium in hand, their community was civilized with literature and philosophy.

As they became familiar with letters in Mesopotamia, they used wax tablets that was rewritable and papyri, other than clay tablets, and enjoyed civilization based on letters.

Effects of Soluble Anthraquinone Application on Prehydrolysis Soda Cooking of *Acacia crassicarpa* Wood

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Acacia crassicarpa has a potential source as a renewable forest material in Indonesia. This research clarified the conditions to produce dissolving pulp with suitable properties from *A. crassicarpa* wood by prehydrolysis at 150 ºC for 3 h and soda cooking at 160 ºC for 3 h with application of 0.1% soluble anthraquinone (SAQ: 1,4-dihydro-9,10-dihydroxyanthracene sodium salt). The presence of SAQ in soda cooking exhibited a significant increase in pulp yield (1.8%) compared to kraft cooking at a given kappa number (approximately 11). The bleaching ability of the soda-SAQ pulp in elemental chlorine-free process with peroxymonosulfuric acid (O-D_0/P_{sa}-E_p-D_1 sequence) was sufficiently good for dissolving pulp properties. The α-cellulose content, brightness, viscosity and ash content were 94.1%, 88.1% ISO, 10.3 mPa・s, and 0.02%, respectively.