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Burning Issue - Earning Solution

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Abstract

SEPARATION OF WASTE PLASTICS: For RCF based Paper Mills Plastics is a Burning issue. The waste paper comes with lot of contaminants particularly plastics in the form of laminations, sealing tapes, binding tapes etc. The separation during slushing process in pulpers where almost 95% plastics are removed is a serious problem consuming a lot of labour, time, loss of production etc. PMPS'S OCTO REJECT SYSTEM solves the issue by separating and dumping the above waste with minimum manual intervention, besides saving fibre and water.

WASTE PLASTIC TO "PLAST OIL": The moist plastic waste with other contaminants are moved, stored and processed in PYRALYSIS DRUM, to generate SYNTHASIS GAS which is cooled in condensers to get 'PLAST OIL' a substitute for FURANCE OIL, L.S.DIESEL which is easily saleble as FUEL OIL.

The PLAST OIL PROJECT for processing 15TPD of plastic waste will have a payback period of 2/3 years.

Keywords: *Octo Reject System, Pyralysis, Synthasis gas, Plastoil , Pyrodrum.*

INTRODUCTION

Paper Mill Plant Suppliers led by a post graduate mechanical engineer, started in a small way in 1986 made first INDIAN MADE HI-CON PULPER

2 Nos Duplex Board Machines

15 Nos Paper Machine Renovation

Many Equipment for Pulp Mill

Researching Solid Waste Management, particularly Disposal/ Conversion of Waste Plastics

Based in COIMBATORE – SIDCO

Develops IDEA'S AND MACHINERY to solve BURNING ISSUES With EARNING SOLUTION

SEPARATION OF CONTAMINANTS

Working Principle – See Fig.1

The OCTO REJECT consists of a tubular screen connected to Pulper/Dilution Pulper through a valve. The tubular screen stands on its frame work. An open screw helical wiper rotates inside the screen drum receives the contaminated stock, accepts stock through screen drum and the contaminants are scrapped and moved upwards to the delivery chute. A shower from the top washes the contaminants to recover are washed to recover fiber sticking to them. Further a set of wiper pads mounted in the helical rotor cleans the perforations continuously enabling easy discharge of recovered fibre. Thus screened pulp and wash water move to the outer jacket and the outlet is connected to stock delivery pump. The delivery position of contaminantes is at higher level and a cart/Trailer can be kept to receive washed contaminantes for disposal. The "OCTOREJECT "works during discharge time only.

Octo Reject System – Applied To Low Consistency Batch Pulper - See Fig.2

The system works during the emptying cycle. A trap catches stock with contaminants and the valve V2 is opened till its level, to catch the floating contaminants followed by V3 to deliver contaminated stock to Octo Reject System. After accepting stock, the contaminants are lifted to delivery port and delivered to the BIN, trailer. A ring shower washes the contaminants & plastic waste to recover sticking fibres. The accepted stock is taken to the pump to process .

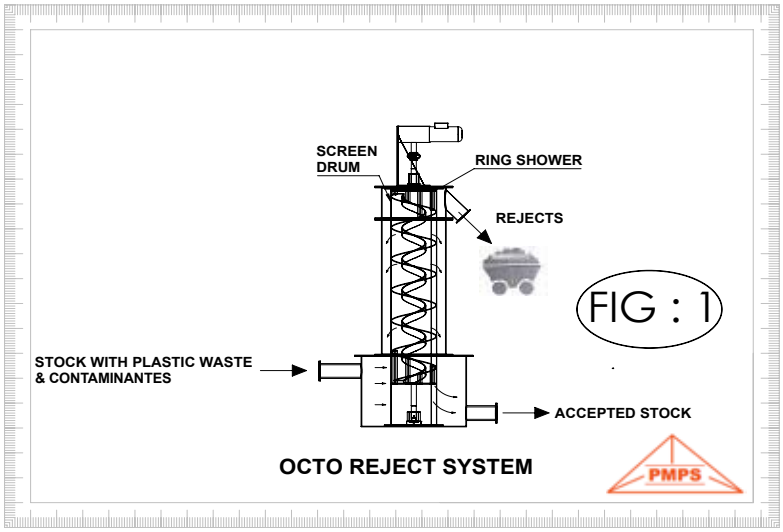
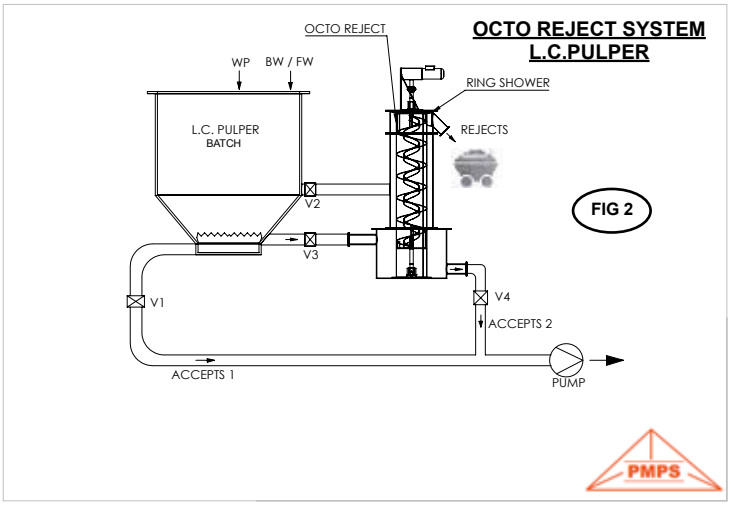
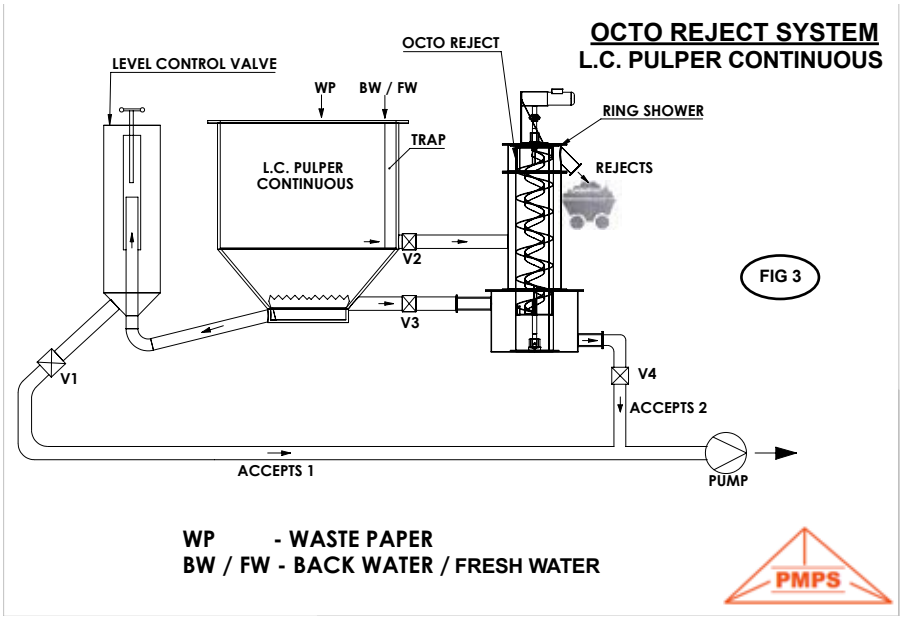


FIG : 1



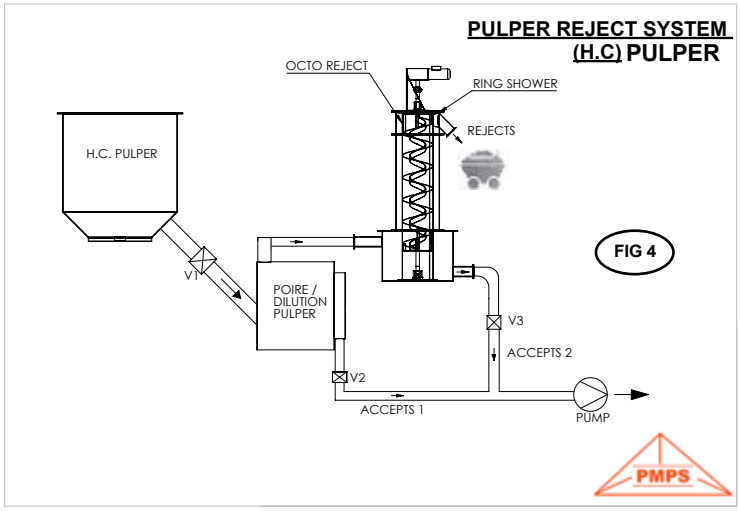
Octo Reject System – Applied To Continious Pulper - See Fig.3

The operation is similar to low consistency batch works during emptying cycle.



Octo Reject System - Applied To Hi-con Pulpers - See Fig.4

The OCTO REJECT SYSTEM is attached to POIRE/DILUTION PULPER/PIMPO/ DECONTAMINATOR, as named by various manufactures. Once the stock is fully slushed and discharged to POIRE/ DILUTION PULPER, the OCTO REJECT SYSTEM works simultaneously to move contaminants to ease out congestion in the POIRE equipment making the equipment to perform without jamming. The contaminants passing through OCTO REJECT SYSTEM, are washed to save fibre and delivered directly to cart/ bin or similar equipment. The accepts pass through screen drum and pumped to process.



Storing Of Plastic Contaminated Waste

A 10° inclined platform with all worn out suction box tops is made & all wet contaminants are stored for a day, excess water will drip down and plastic contaminants may be around 20% moisture. A JCP or similar material handling equipment is used for transfers.

Earning Solution Plastoil Plant - See Fig.5

Plast oil plant – converts plastic waste to fuel oil

Feeding Chute:

The waste plastics as removed from slushing, screening equipment is just unloaded from TRUCK/TRAILER/ CART to FEEDING BIN this is just below ground level having a platform with an inclination to drain out moisture by gravity. The material may be loose or baled (being unwired)

Feeding Conveyor:

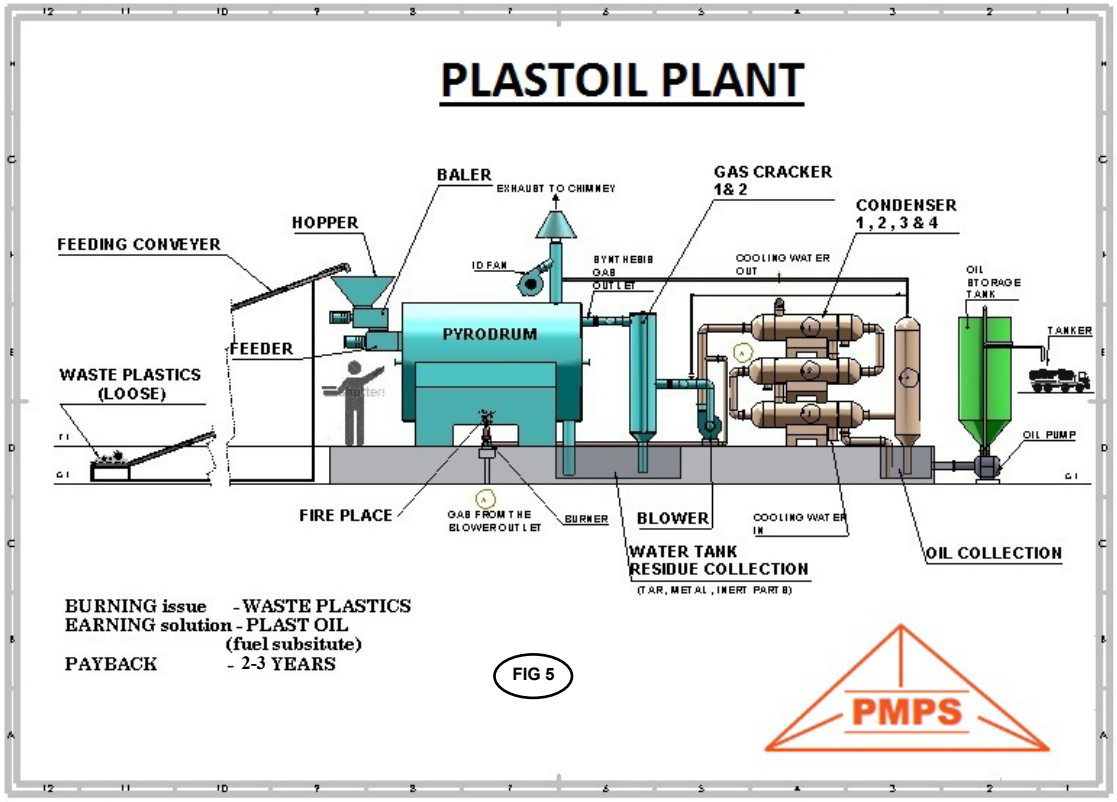
The FEEDER BIN is fitted with a suitable conveyor below FL to lift & convey waste plastics through hopper to feed a baler. The system needs standardized bales to feed the PYRODRUM with restricted air conditions. The hopper is having vibrating arrangement to keep the dumping live.

Baler:

Thus the dumped materials are compressed and a bale is made. After the bale is made it is dropped to a FEEDER and its exit gate valve is closed. Normally the bales are of sizes 600X600X600mm weight around 200kg±20kg.

Feeder:

Feeder is an air tight chamber with a piston which pushes the bale into PYRODRUM when its charging gate is open.



Pyro Drum:

This is the most critical part of the plant where the materials undergo PYRALYSIS process under mild vaccum conditions. The DRUM is heated by conventional methods, using LPG,DIESEL, CRUDE OIL,FURNACE OIL,etc and the materials are raised to a suitable temperature to start the PYROLYSIS reaction. Once the reaction starts the waste plastic will melt and evolve SYNTHYSIS GAS

A blower maintains low vaccum and once the gas is evolved the next bale and subsequent bales are changed. Two rotors inside the drum continuously brakes, rotates the materials so that the reaction becomes vigorous. Thus generated SYSTHYSIS GAS passes through a GAS GRACKER and stablises itself as a inflammable gas.

Part of the gas generated is taken to fire place (optionally) and used for heating PYRODRUM.

The rejects TAR,INERT MATERIALS, IRON scrap are pushed by a rotor to reject port with air tight gate and delivered to collection tank

Gas Cracker:

The GAS CRACKER is an equipment which brakes the gas bundles and homogenious the gas to stabilize its calorific valve.

Blower:

The blower maintains a slight vaccum in PYRODRUM sucks the gas through GAS CRACKER and forces it to a bank of condensers.

Condensers:

A well designed condenser uses water as cooling media, condenses the SYNTHYSIS GAS to liquid, named as PLASTOIL which is collected in tank, pumped to storage tank for distribution.

By Products:

The rejects from Pyrodrum contains,

Iron Scrap - Saleable

Metal Scrap - Saleable

Tar - Saleable for road making

Inert Scrap - To be disposed/land filled less than 0.5% of input.(Normally)

Output For 15 Tonnes of Waste Plastic (Paper Mills)

PLAST OIL - 3000 to 5000 Lits

TAR - 100 to 200 Kgs

MISCELLANEOUS, METALS, SCRAP - 100 Kgs

Conclusion

As we have to live with plastic waste the above ways will certainly ease out working conditions and if implemented individually inside a mill or jointly outside mill will certainly meet the requirement as a POSITIVE EARNING SOLUTION with positive environmental impact. The process is universally accepted and meets PCB Norms.

OTHER PRODUCT FROM PLASTIC WASTE

Paver Block – Plastone

Wall Panel with Plastone

Chip Toilet made with Plastone Panel