



COMPACT DESIGN FOR AUTOMATIC BLANKET WASHER

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ABSTRACT

This document gives information about Automatic blanket washer, types of automatic blanket washer, and components of automatic blanket washer, environmental and health benefits of developed design of automatic blanket washer.

KEYWORDS: Automatic Blanket washer, Debris, VOC

INTRODUCTION

The present device provides an automatic cleaning device for cleaning synthetic rubber blanket cylinder for large size sheet fed and web fed offset lithographic printing presses. This device includes flat brush assembly with Polypropylene (PP) as base material for loosening foreign particles, dried ink and paper lint's from blanket cylinder surface. The device also includes synthetic rubber scrapper against rotating blanket cylinder which washes the mixture of dried ink, paper lint's, foreign particles and fluid blanket wash. Further, device has pipe with nozzles and pumping station. By maintaining accurate pressure on pumping station blanket wash is spray on blanket cylinder through pipe nozzles. This enables the device self-cleaning while at the same time prevents blanket wash waste from invading inker and dampening unit. The blanket cleaning operation which takes as long as ten minutes on a large sheet fed and web fed presses.

OBJECTIVE

The objective of the "Automatic Blanket Cleaner" project is to perform a full-scale demonstration and evaluation of a unique and highly innovative blanket cylinder cleaning system for the newspaper and semi-commercial printing industry. The aim is to minimize or possibly eliminate problems and the use of solvents in the cleaning process. The innovative aspect of the project is to present a new way of tackling the cleaning of presses. Instead of cleaning the printing blankets it will remove the causes of staining in the printing press and debris from the paper webs, preventing it from reaching the printing press.

TYPE OF AUTOMATIC BLANKET WASHER

The procedure followed today in the vast majority of printing plants is to periodically interrupt printing process and manually cleaning the blankets while jogging the press. Since the cleaning process necessarily results in press "Down time," it is highly desirable that the amount of "down time" be minimized while at the same time obtaining effective cleaning and drying of blanket cylinder.

Spray application system

This system is available for web presses and operates by applying cleaning solvent directly to the blanket. The web continues to feed through the press, carrying away excess

ink and debris dissolved by solvent. Spray system typically involve a relatively small capital investment relative to other blanket wash systems but manual scrubbing action is necessary. It requires too much time for cleaning, more man efforts and wastage of solvent is also more.

Brush roller system

Unlike spray systems actively scrub blankets surface with a stationary brush assembly against rotating blanket cylinder. Two types of brush systems are available: - dry type and wet type. Wet type brush systems dispense controlled quantity of solvent onto the brush. Solvent is not applied directly to the blanket. Dry type brush systems mechanically clean the blanket surface but are not wetted with cleaning solution. Dry type systems are used only on coldest web presses. It took time for complete drying of blanket surface.

Cloth based system

Operate by applying a web of cloth to the rotating blanket depositing excess ink and debris onto the cloth. After completing the cycle the spent cloth advances and a fresh section of cloth is left in its place. Cleaning solvents are applied to the cloth and not directly to the blanket.

SCOPE OF EXPERIMENT

An alternative to washing blankets manually is to use to automatic or mechanized blanket washer. Automatic blanket washing is a technology that uses spray, brush and cloth system to clean the rubber blankets with little or no human assistance while press is running. Automatic blanket washers are becoming increasingly available standard equipment on new web and sheet fed presses and retrofit on older process.

Although usually marketed as cost and labour saving devices, automatic blanket washers may also provide environmental benefits by reducing VOC solvent use and need for wipe rags, some system also have solvent reclamation system and are designed to minimize fugitive emission in the workplace. In addition blanket washers might've some health and safety concerns for press operators because they reduce press operators contact with solvent, rags and moving cylinders. It is important to notice that even presses equipped with automatic blanket washers still require occasional manual blanket washing for end run applications. Performance of automatic blanket

washer run gamut from printers who say that automatic blanket wash work faster than manual washing to those who have given up and actually removed blanket washers from their presses. Clearly the type of blanket washer and type of printing done play large role in effectiveness of blanket washer.

Automatic blanket washer appear to more relevant on web presses where they can be used for blanket washing during press run. Blanket washers less popular for sheet fed presses where shorter run lengths allow printers to manual blanket washing with end of production runs.

The potential savings associated with using an automatic blanket washer instead of manual cleaning blankets includes:

- In most cases, wash for wash, automatic blanket washers reportedly use less solvents than manual washing which translate into lower solvent costs for the printer.
- Because the automatic blanket washer allow the press operator to perform other tasks during wash cycle there may be significant labour savings associated with this device.
- Make ready time is shortened because the press does not stop during the blanket washing process.
- Wipe rag use is reduced which confers savings in the area of rag purchasing or in rag releasing contracts.
- Some printers claim that blanket life is prolonged through use of automatic blanket washers.

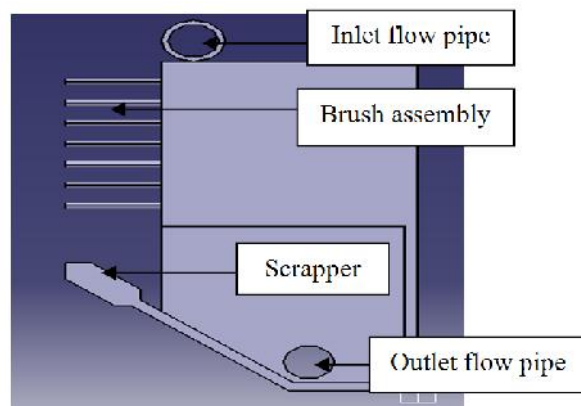
CONCEPTUAL SETUP

This invention relates to a blanket cylinder cleaner and more particularly to device for automatically removing the debris which collects on to the blanket cylinder of an offset lithographic printing process during the printing process. The invention further related to an automatic blanket cylinder cleaner which replace the requirement of manual cleaning and which accomplishes cleaning consistently and expeditiously. In order to maintain high quality it is necessary to periodically clean blanket cylinder of printing press. It is known that excessive debris such as foreign particles, dried ink particles and paper lint's cause's deterioration in print quality. For this reason, it is necessary for the press operator to periodically interrupt printing process in order to clean debris from the blanket surface.

This cleaning operation, which take as long as ten minutes on large sheet fed press and less than that for web fed press usually consists of following steps:- First, factory specified blanket washing solvent is spread on the blanket cylinder surface and on the bristles of the brush same time through the pipe nozzles. Secondly, loosening of foreign particles from blanket cylinder surface can be done by the bristles of the brush. Loosening of those particles depends upon the hardness of bristles.

At the last, the mixture of foreign particles and washing solution is cleaned and wipe out by the rubber scrapper. After some rotation of blanket cylinder scrapper make it completely dry. Drying minimizes paper waste when the press begins operations. All the steps can be done on running press machine itself.

EXPERIMENTAL SETUP



Schematic Construction of Blanket washer

a) Brush Assembly

The brush assembly will consist of 30 inches long in length, 20mm in height and 1 inch in width.

Bristles - The brush assembly will consist bristles made up from nylon which is better hardness and chipper in cost as compare to other bristles material will be 0.3 in diameter and the outer length is 15mm. doesn't affected by solvent.

Polypropylene base material - Corrosion free material, good dimensional stability, good bristles holding capacity. In dimension it is 30 inches long, 1 inch wide and 20mm height. It gives better chemical resistance.

b) Scrapper

It cleans the blanket cylinder surface and made up of synthetic rubber material which can be holds by metallic holder plates and tighten by screw and bolts. Scrapper should be softer than blanket hardness. It can be set on the machine within the gravity

c) Pipe with Pumping Motor

Pipe is use to spray washing solution on to the blanket surface. It is made up of plastic material which is 1 inch in diameter and 40 inch in length. Will have circular holes on its periphery at the distance of 2 inch from previous one. Pumping motor is use to control the force and pressure of spread solution.

d) Body Frame Of Device

Casting iron material is use for body frame 35 inch in length and height will be 6 inch. Thickness is 2 mm.

Total Dimensions Of The Device: - Length – 30 inches, Width – 1.48 inch, Height – 1.37 inch

Total Costing Of The Device:- Brush Assembly, Scrapper, Pipe with pumping motor, Body frame of device, Fitting and other expenses all assembly cost approximately 3000 rupees.

FUNCTIONAL CONSIDERATIONS OF DEVICE

The development of an automatic blanket cleaner involves several factors to be considered, including the nature of the solvent to be used.

In order to be effective an automatic blanket cleaner must be capable of washing the blanket cylinder with two types of solvent, one for water soluble debris and another for debris insoluble in water. Usually, the solvents are water and a hydrocarbon solvent. When washing debris which is water soluble, such as lint, clay coating and gum, plain

water can be used. It has been found that a hydrocarbon solvent is required when debris is ink based since this type of debris is not soluble in water. It has also been found that the blanket cleaner must be must designed so that it is capable of cleaning the blanket with a relatively mild solvent because high strength solvent may damage the rubber covering on blanket cylinder and scrapper.

The problem involves the mechanical loosening of the debris on blanket cylinder. Frequently, the debris which builds up on the blanket of the offset press adheres blanket tenaciously and cannot be easily removed. Thus, to perform under all conditions, an automatic blanket cylinder cleaning system must provide for a mechanical loosening or scrubbing action so as to dislodge debris which sticks to the blanket surface so that such debris can be removed.

The third significant factor is that the automatic blanket cylinder cleaning should significantly decreases the cleanup time. On a sheet fed press, automatic wash-up time should not exceed two minutes and preferably should be no more than one minute. On a web fed press, the wash-up time even less in order to minimize paper wasted during the wash-up.

The fourth factor to be considered is that the wash-up fluid must be confined to the blanket cylinder so as not to contaminate other press part. It is particularly important that fluid not be allowed to enter the gap in the blanket cylinder where it can subsequently leak out and contaminate the blanket or plate during printing. Also, if solvent seeps under the rubber coating on the blanket cylinder it can causes blanket swelling and shorten blanket life. It is equally important to confine water when it is being used as a solvent since water can causes corrosion of press components.

A fifth factor is that the blanket cylinder must be completely dry before printing is resumed. Complete drying is particularly important when the wash-up liquid is solvent since solvent left on blanket will contaminate the ink train and causes excessive paper waste on resumption of printing. Similarly, an excess of water left on the blanket following wash-up can disturb the ink water balance and result in increased paper waste.

A sixth factor to be considered for blanket cleaner device is reduction in the consumption of solvent. One reason, of course, is reduction in cost by use of less solvent. However, in web press applications, lower solvent usage is also important in order to reduce the possibility of explosion in web press dryer. That is, more web presses used for commercial printing employ heat set inks which are dried by passing the printed web through an oven which drives off the ink solvents by evaporation. If an excessive amount of wash-up solvent is used, this solvent can cause an explosion when it is carried into the dryer by the web.

A seventh factor to be considered is reduction of environmental impact of the cleaning operation. Where the waste material is in liquid form there can be serious problems in the disposal of the liquid waste since there are many restrictions place on disposal of such materials. Therefore, where possible, it is describes that such waste material is in solid form.

Space conservation and compactness must also be considered in developing such equipment. There is very little space available on most printing presses for installation of automatic cleaning equipment. In addition, the installation of such equipment should not obstruct access to either blanket or plate cylinder since both plates and blankets must be changed periodically.

Most significant feature required of automatic blanket cleaner is that they require a minimum of maintenance for reliable operation. This is particularly important on presses which are run around the clock since time spend on maintenance can reduce the time that après is available for production. In addition, to be efficient the automatic blanket cylinder cleaner should complete its function in about two minutes, and preferably one minute, and should be even less on a web press.

CONCLUSION

New developed design of blanket washer shows superior and efficient working and gives beneficial output on Environmental as well as on Personal Health and Safety aspects.

Environmental Aspect

Environmental benefits and costs associated with automatic blanket washers include:

On a per wash basis automatic blanket washing conserves solvent as compared to manual washing. Because automatic blanket washing is more convenient than manual washing however press operators may clean blankets more frequently. Currently there are insufficient data to assess whether total solvent use increase or decrease in practice.

Because a large amount of paper is wasted in manual blanket due to press start up and shut down automatic blanket washing may conserve paper.

Low VOC solvent may be used with some system.

Health and Safety Aspect

Workers safety issue associated with automatic blanket washing system includes:

- Direct worker contact with solvent is reducing.
- With this system much of the solvent can be reuse.
- Diminished fugitive VOC emissions in the workplace.
- Workers can lesser exposure to potentially dangerous moving press cylinders associated with manual cleaning.
- Reduced losses to evaporation.
- Reduced regulatory requirements.

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