

DYEING AND PRINTING TD-203

II TEST

TOTAL MARKS-15

- Q. Explain:-
- (A) Dyeing Process of Direct Dye. - 5
 - B. Classification of Direct Dye. - 3
 - C. Jigger Dyeing M/c - 4
 - D. Padding mangles Dyeing M/c. - 3

Answers:-

- (A) Dyeing Process of Direct Dye:
Introduction

Direct dyes are one of the most versatile class of dye stuff applicable to cellulose, wool, silk, nylon fibers. This dye have inherent substantivity for cotton, and for other cellulosic fibers.

Dyeing process:-

Direct dye are applied to cellulosic fibers from aqueous liquor to which is added an electrolyte such as NaCl or Na_2SO_4 . The addition of electrolyte to the dye liquor is essential to obtain adequate exhaustion of the dye molecule by the fibers polymer system.

When sodium chloride is added to the dye liquor it dissociates completely into sodium ion (Na^+) and chloride ion (Cl^-). The cellulosic fiber in the dye liquor has a negative surface charge attracting to it sodium cation. This neutralises the negative surface

charge to the fiber, the presence of the chloride ion (-) in the dye liquor also assists the dye anion to leave the dye liquor and enter the fiber polymer system. This is the result of repulsive force between the dye anion and the chloride anion.

The dyeing is started at the room temp. in the absence of the salt. After some time the temp. is gradually raised to about 60°C in exhausting agent added and the temp. raised to about 100°C and the dyeing completed at this temp. till the dye bath is almost completely exhausted.

B. Classification of Direct Dye: —

Classification of Direct Dye is follows: —

1. Class A: — Dyes that are self-leveling i.e. dyes of good migration or leveling properties

CLASS B: — Dyes that are not self-leveling but which can be controlled by addition of salt or electrolyte to give level results. they are described as salt-controllable

CLASS C: — Dyes that are not self-leveling and which are highly sensitive to salt and exhaustion of these dye cannot adequately be controlled by addition of salt alone and they require additional control by

(3)

Temp. they are described as temperature controllable dyes.

c. Jigger Dyeing Machine

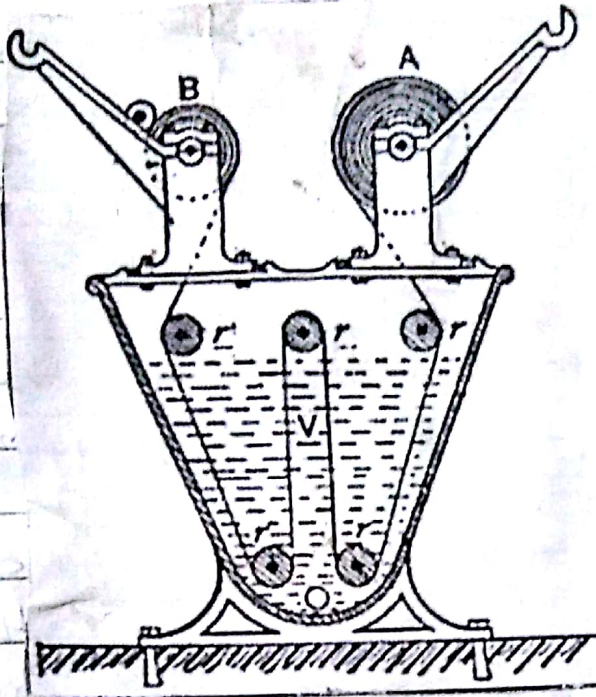
Jigger dyeing machine is one of the oldest dyeing m/c used for fabric dyeing operations.

Jigger dyeing m/c is more suitable for the dyeing of woven than knitted fabrics. Since the fabric is handled in open-width, a jigger is very suitable for fabric which crease when dyed in rope form.

Machine Description:

Jigger m/c have two main rollers which revolve on smooth bearings and are attached to with a suitable driving mechanism, which can reversed when required. The fabric is wound on one of the main rollers and fed from the other. The fabric move from one roller to the other through the dye liquor trough located at the lower part of the m/c. There are various arrangement of guide rollers at the bottom of liquor trough, and during each passage the cloth passes around these guide rollers.

Live steam injected into the bottom of the trough through a perforated pipe across the width of the jigger heats the liquor.



A = Let-off Roller
B = Take-up Roller
r = Guide Roller
V = Liquor

JIGGER DYEING M/C

D. Padding Mangle Dyeing machine:

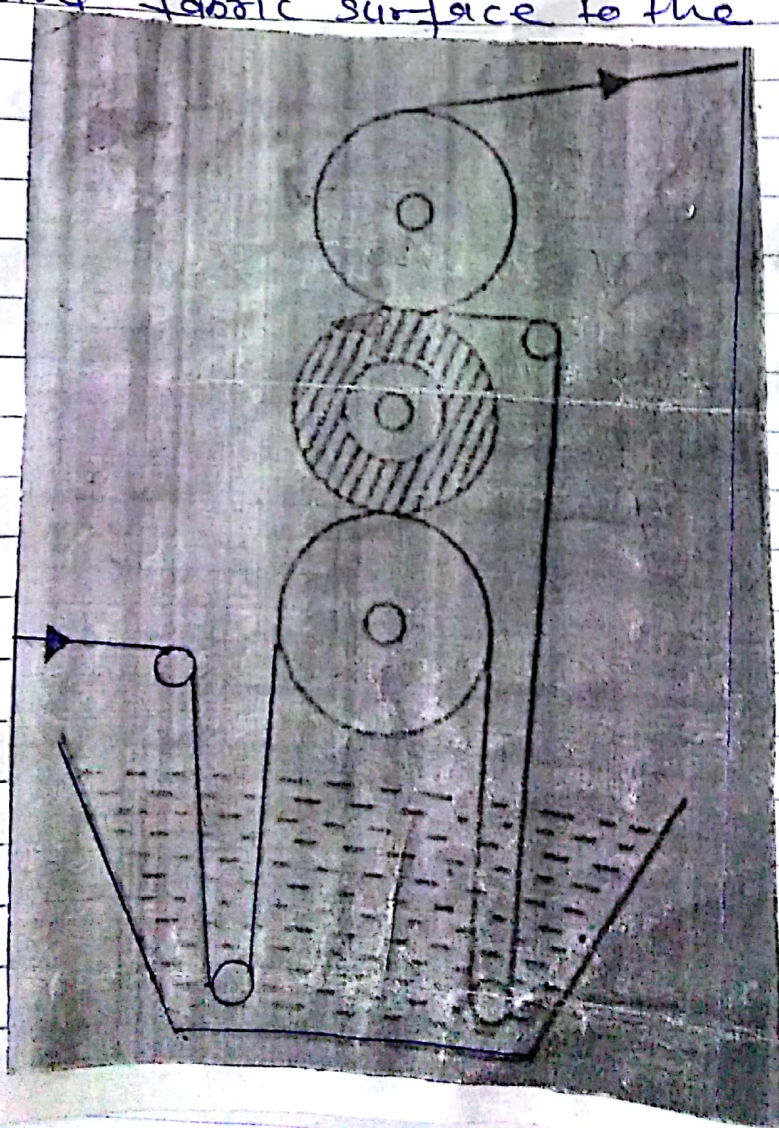
The pad dyeing m/c overcome the deficiency of winch and jigger dyeing m/c of smaller batch size and discontinuity in dyeing.

Padding mangle offer continuous process of the fabric is concerned liquor such as pretreatment dyeing or finishing.

Application of dyestuff is conducted in the pad dyeing m/c with single or multiple clipping in solution. During padding the fabric passes into a solution of chemicals under a submerged roller and out of the bath. The objective of this process is to mechanically impregnate the fabric with

The solution or dispersion of chemicals pad impregnate ~~the~~ fabric is common for the dyeing of fabric and for the application of finishing chemicals.

The padding operation itself consists of two essential steps: thorough impregnation by immersion of the absorbent fabric in a dye solution, containing a wetting agent, followed by the squeezing of the wet fabric between rollers to expel air and replace it with dye liquor as well as expressing surplus liquor back down the sloping fabric surface to the pad trough.



PADDING
MANGLE
DYEING M/C

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