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(54) Title: SYSTEM COMPRISING A FEEDING TUBE FOR ADJUSTING MIDDLE-SIDE COLOR DIFFERENCE IN TEX-
TILE OPEN-WIDTH STRAIGHT DYEING PROCESS

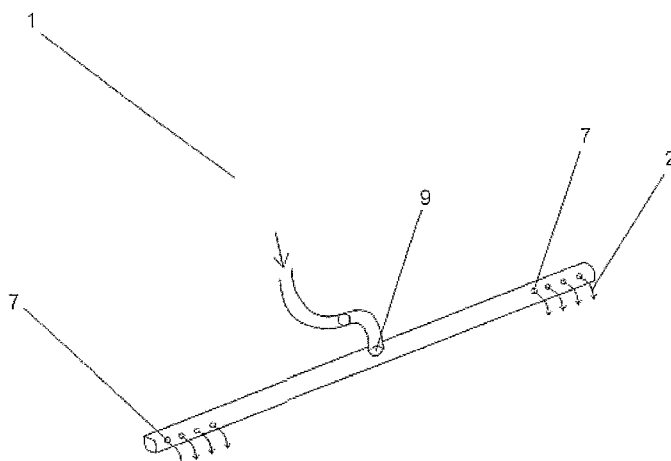


Figure-1

(57) Abstract: The invention relates to the feeding tube (1) that is used in textile open-width dyeing machines and it is character-
ized in that it does not include hole (7) in the middle parts thereof (which corresponds to the cloth) to solve middle-side color dif-
ference problem and to provide complete and homogenous mixture of two different colors of dyes (2,3) (new fed dye/dyes (2) and
regurgitating dye/dyes (3)) therein; it carries out the feeding from the both sides of the vat (6) and it is positioned in the front part
of the dyeing vat (6.1) (the part where the cloth enters to the vat). By means of the system that is the subject of the invention, mid-
dle-side color difference can be solved in proportions up to 100 %. The said rate can change depending on the structure of the
cloth (10).



SYSTEM COMPRISING A FEEDING TUBE FOR ADJUSTING MIDDLE-SIDE COLOR DIFFERENCE IN
TEXTILE OPEN-WIDTH STRAIGHT DYEING PROCESSField of the Invention

The invention relates to a new feeding tube that is improved for eliminating the middle-side color difference in the textile open width dyeing machines and a method regarding the use of the said tube.

By means of the system that is the subject of the invention, middle-side color difference problem can be solved in proportions up to 100% (according to the structure of the cloth).

Background of the Invention

In prior art, open-width straight dyeing method is a dyeing style which is used quite often in cloth dyeing process in textile sector. By means of this method, white cloth whose pretreatment is completed in dyeing is passed through a vat filled with liquid dye, and is dyed by being wrung balancedly. Surplus liquid dye resulting from wringing regurgitates to vat. However, a little liquid dye diminishes from the vat together with dyed cloth. Therefore, the feeding of diminished liquid dye should be carried out to the vat with an automatic controlled system. The said feeding process is carried out by means of "Feeding tube" at present.

Wringing process is carried out in the wringing cylinders that are called as "S-Roll" in textile sector which is derived from the words "Swimming Rollers". However in the clothes that are wrung in these special cylinders, middle-side color difference that is the biggest problem of the establishments which carry out textile open-width straight dyeing process is seen. Today, it is tried to solve this problem by changing the middle-side pressure forces of wringing cylinders that wring the surplus dye from the cloth.

In dyeing process carried out by present open-width straight dyeing, clothes are painted by means of dyeing vat and "S-Roll" wringing cylinders. Cloth that is pretreated, cleaned and bleached completely enters to the vat. For getting

the liquid dye thereon better, the cloth is taken out of the vat by being passed through "Inner Vat Cylinders". The continuous passage of the cloth is provided by pull- driving cylinder that is in the outlet of the vat.

Before entering wringing cylinders, there is too much liquid dye on the cloth which gets out of the vat and this surplus dye should be wrung. The surplus dye is wrung by aforementioned special wringing cylinders namely "S-Rolls". The pressure forces of these cylinders that are in left-middle-right sides can be adjustable separately.

Surplus dye wrung by "S-Rolls" regurgitates continuously from the two surfaces of the cloth passing through the vat and turns back to the dyeing vat. Liquid dye which is as much as the amount that removes from the cloth should be fed back to the vat. This process is provided by feeding liquid dye by an automatic level controlled pump continuously.

In the present applications, the said liquid dye is fed to the vat from perforated chrome pipe along the vat width by means of dye pump. It is the main aim to carry out feeding as much as balancedly along the vat width. Therefore, there are many holes which are in equal diameter and at equal intervals on the perforated chrome pipe that is called as "Feeding Pipe" and the liquid dye sent by the dye pump flows into the "Dyeing vat" from these holes balancedly along the vat width.

In known applications; with the above mentioned form, "Feeding Tube" is located onto the dyeing vat, to the outlet part where the cloth leaves the vat. Therefore, it is aimed to provide a complete mixture of the new dye coming from the feeding tube with the dye regurgitating over the cloth to vat.

In present situation, new dye and the dye regurgitating to vat flow from the small clearances towards the front part by getting mixed in the back part of the vat. The reason of flow of the dye from back to front is as follows:

Since the part where the dry cloth enters to the dyeing vat is the front part, a significant amount of the dye penetrates to the cloth in the front part. Surplus dye that regurgitates from "S-Rolls" by new dye feeding is poured to the vat from the back part of the vat. Therefore, liquid dye flow from back to front is a

normal case. Since the inner part of the vat is partially divided into two parts by the "Inner vat cylinders" and the cloth itself, the flow of the dye flowing from back to front is possible only from small clearances that are on the both sides of the vat. The said clearances are the bearing clearances of "Inner vat cylinders". The flow velocity and thereby flow rate of this dye mixture coming from both sides in the vat are not equal along the vat width. Although the velocity of the dye mixture flowing towards both sides is low in the middle part of the vat, it increases when approaching to the side parts. The reason thereof can be explained as follows:

While surplus dye regurgitating from wringing cylinders along the cloth width is flowing towards the sides, it gradually increases (Because surplus dye regurgitating from both sides of the cloth flows towards the sides by combining with the surplus dye regurgitating from the middle). The increase of dye which passes through the same section causes the increase also in velocity and flow rate in sides. New dye feeding (as mentioned before) is carried out equally from the back part of the vat along the cloth width by means of "Feeding Tube". Therefore the flow rate of surplus dye regurgitating over the cloth is higher in the both sides compared to the middle. Hence, while mixture rate of old dye to new dye is approximately 1,2 in the middle of vat, this rate can be 1,5 in the sides. Fully penetration of dye to cloth completely can be completed only after being wrung by "S-Rolls". Mixture difference under "S-Rolls" becomes stable permanently to the cloth wrung by "S-Rolls".

As a result of experimental studies carried out by taking samples to vat firstly from new dye coming by means of "Feeding Tube" and then surplus dye regurgitating over cloth to vat (while the machine is operating):

When two parts of the same cloth is painted with both sample dyes in laboratory environment with equal prescription and conditions, it is seen that there is color difference (the amount that is tried to be adjusted by invention) between the two parts. Therefore, surplus dye regurgitating by being wrung in "S-Rolls" by contacting with the cloth change color and there are two different colors of dyes in the same dyeing vat. A reason of this is that some residual chemical substances on the white cloth affect the dye.

The mixture of the dye which acquired a different color and regurgitates over the cloth with new fed dye in different proportions between the side and middle of the cloth as mentioned above results in middle-side color difference on the cloth. This problem is one of the biggest problems met in the cloth dyeing process in textile sector.

In prior art, it is assumed that the said color difference occurs because of that pressure forces between middle and sides of "S-Rolls" are not equal. Therefore, it is tried to adjust the color difference by pressure adjustment. However, a complete adjustment is not possible as mentioned. While occurrence reason of color difference is revealed chemically, "S-Rolls" can adjust the amount of the liquid dye on the cloth (dye weight/cloth weight=pick-up is a term used in textile. The proportion of liquid dye weight on the cloth to cloth weight is adjusted by S-Rolls).

Our invention aims to solve substantially the middle-side color difference occurred on the cloth by means of "New Feeding Tube" which is improved based on the present shortcomings, and by changing the place of this tube.

An aim of the invention is to provide complete and homogeneous mixture of two different colors of dyes in dyeing vat.

Figures of "New System Feeding Tube Design For Adjusting Middle-Side Color Difference In Textile Open-Width Straight Dyeing Process" which is manufactured for to achieve the purpose of the invention are in the appended pages and they are as follows:

Accompanying reference numbers for the description of the Invention

Figure-1: Perspective view of the new system dye feeding tube.

Figure-2: Sectional view of the dyeing vat.

Figure-3: Top view of the dyeing vat.

Accompanying reference numbers for the description of the Invention

1. New Feeding Tube

- 2.** New dye/dyes
- 3.** Regurgitating surplus dye/dyes
- 4.** Inner vat cylinders
- 5.** S-Roll
- 6.** Dyeing vat
 - 6.1.** Front part of dyeing vat
 - 6.2.** Back part of dyeing vat
- 7.** Hole (groove, channel)
- 8.** Side bearing clearances
- 9.** New dye inlet (feeding)
- 10.** Dry cloth (white etc.)
- 11.** Dyed cloth outlet
- 12.** Dyed cloth
- 13.** Mixture of liquid dye
- 14.** Dry cloth inlet

Description of the Invention

"New Feeding Tube" (1) whose representative view is in Figure-1 and that is the subject of the invention is a tube (1) that does not include a hole (7) in the middle parts to which the cloth corresponds, and that carries out feeding from the both sides of the vat (6). The feeding tube (1) preferably has a cylindrical structure and provides the complete and homogenous mixture of two different colors of dyes (13) (new fed dye/dyes (2) and regurgitating dye/dyes (3)) therein. The said tube (1) can be manufactured in cylindrical structure as well as in different shapes depending on the demand.

New feeding tube (1) is located to the front part (6.1) of the vat (the part (14) where the cloth enters to vat). Locating the tube (1) to the front part (6.1) has a role which has not been known up to now in respect of solving the middle-side color difference.

As a result of these two novelties (New feeding tube (1) and locating the feeding tube (1) to the front part (6.1), the mixture of new fed dye (2) and regurgitating dye (3) is recovered in maximum level.

The preferred application of the new feeding tube (1) is as follows:

Surplus dye (3) which is wrung by "S-Rolls" (5) during dyeing flows towards to the front part (6.1) from side bearing clearances (8) of inner vat cylinders (4) by regurgitating from the both surfaces of the cloth as shown representatively in Figure-3. New dye (2) which is fed to the both sides from the front part (6.1) of the vat by means of new feeding tube (1) meets with regurgitating old dye (3) in the both sides of the vat (6). The dyes (2,3) which start to mix here flow inwards the front part (6.1) where the dry cloth (10) enters to the vat by being a mixture (13). The mixture rate of two dyes (2,3) coming towards the dry cloth (white etc.)(10) from the both sides of the vat (6) is stable and does not change.

The said stable mixture rate is the same both in the side and middle part of the cloth (12). Because after being mixed well and in a stable rate, both dyes (2,3) can reach firstly to sides and then the middle of the white cloth (10). Therefore, side and middle of the cloth (10) have been dyed with equal and stable mixed dye continuously. Therefore by means of the system that is the subject of the invention, middle-side color difference problem can be solved in proportions up to 100%. However, the said proportion can change depending on the structure of the cloth (10).

New system feeding tube (1) that is the subject of the invention can be used in any kinds of textile open-width dyeing machines and holes (groove, channel) (7) where dye feeding onto the tube (1) is carried out can be located as much as required in a way to be at least one. However the situation that is preferred here is that the holes (7) are positioned in a way not to be on the cloth (10),

and to be near to the sides of the vat (6) as much as possible. Because in this way, more effective results are obtained and the system that is subject of the invention achieves the purpose thereof better. Holes (7) can be made in different and/or the same diameters.

New dye inlet feeding (9) on the invention is preferably carried out from the middle to provide the balance. Feeding inlet (9) can be made in desired diameter/width. They can be positioned on the tube (1) to be more than one in accordance with the preference.

The said invention should not be limited with the representative applications presented herein. Because it is obvious that some skilled in the art can apply the novelty and similar embodiments that are introduced in the invention. Therefore, it should be taken into consideration that similar-alternative embodiments mean the infringement of our invention.

Claims

- 1.** Feeding tube (1) that is used in textile open-width dyeing machines and characterized in that it does not include hole (7) in the middle parts thereof (which corresponds to the cloth) to solve middle-side color difference problem, and provide the complete and homogeneous mixture of two different colors of dyes (2,3) (new fed dye/dyes (2) and regurgitating dye/dyes (3)) therein; it carries out the feeding from both sides of the vat (6), and it is positioned in the front part of the dyeing vat (6.1) (the part where the cloth enters to the vat).
- 2.** Feeding tube (1) according to Claim 1; wherein it can be manufactured in desired sizes depending on the machine.
- 3.** Feeding tube (1) according to Claim 1 and 2; wherein the holes (groove, channel) (7) thereon are positioned in a way to be at least one; preferably not to be on the cloth (10), and to be near to vat (6).
- 4.** Feeding tube (1) that is used in textile open-width dyeing machines; wherein it preferably has cylindrical structure.
- 5.** Feeding tube (1) according to Claim 4; wherein it can be manufactured in cylindrical structure as well as optionally in different shapes.
- 6.** Feeding tube (1) according to one and/or a few of the preceding claims; wherein the holes (groove, channel) (7) thereon can be in different and/or same diameters.
- 7.** Feeding tube (1) according to one and/or a few of the preceding claims; wherein there is at least one new dye inlet feeding (9) thereon which is in desired diameter/width.
- 8.** Feeding tube (1) according to one and/or a few of the preceding claims; wherein the said dye inlet feeding (9) is preferably in the middle on the tube (1).
- 9.** Feeding tube (1) according to one and/or a few of the preceding claims and characterized in that it includes side bearing clearances (8) which provide

regurgitation of the surplus dye (3) that is wrung by "S-Rolls" (5) from both surfaces of the cloth, and the flow of the said dye towards the front part (6.1).

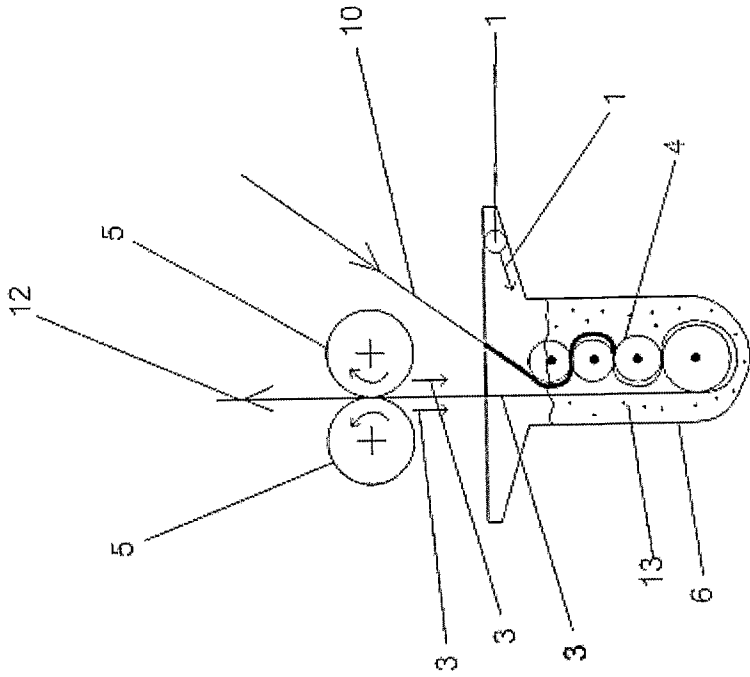


Figure-2

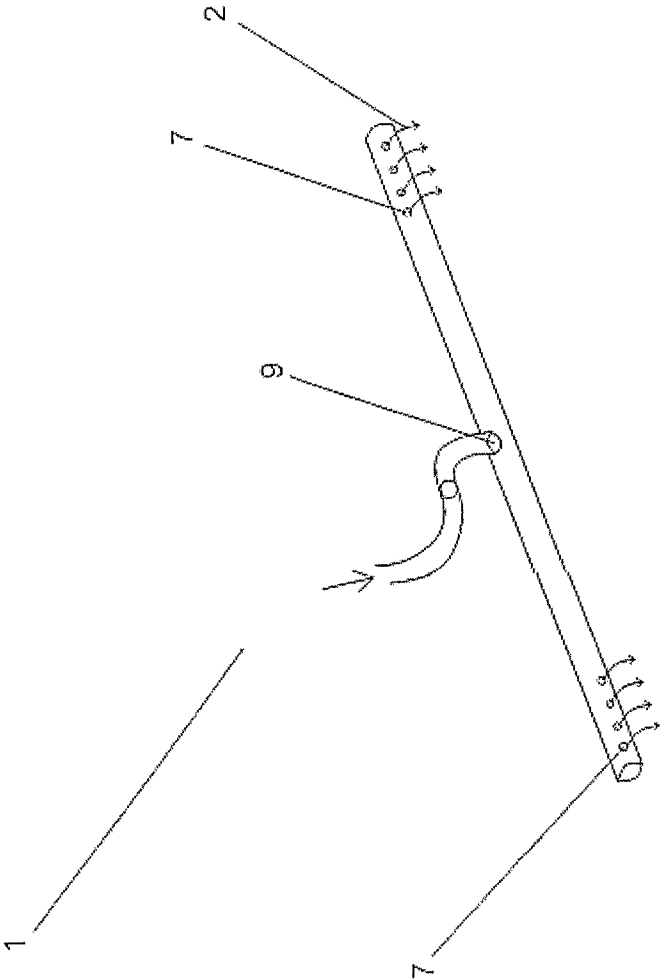


Figure-1

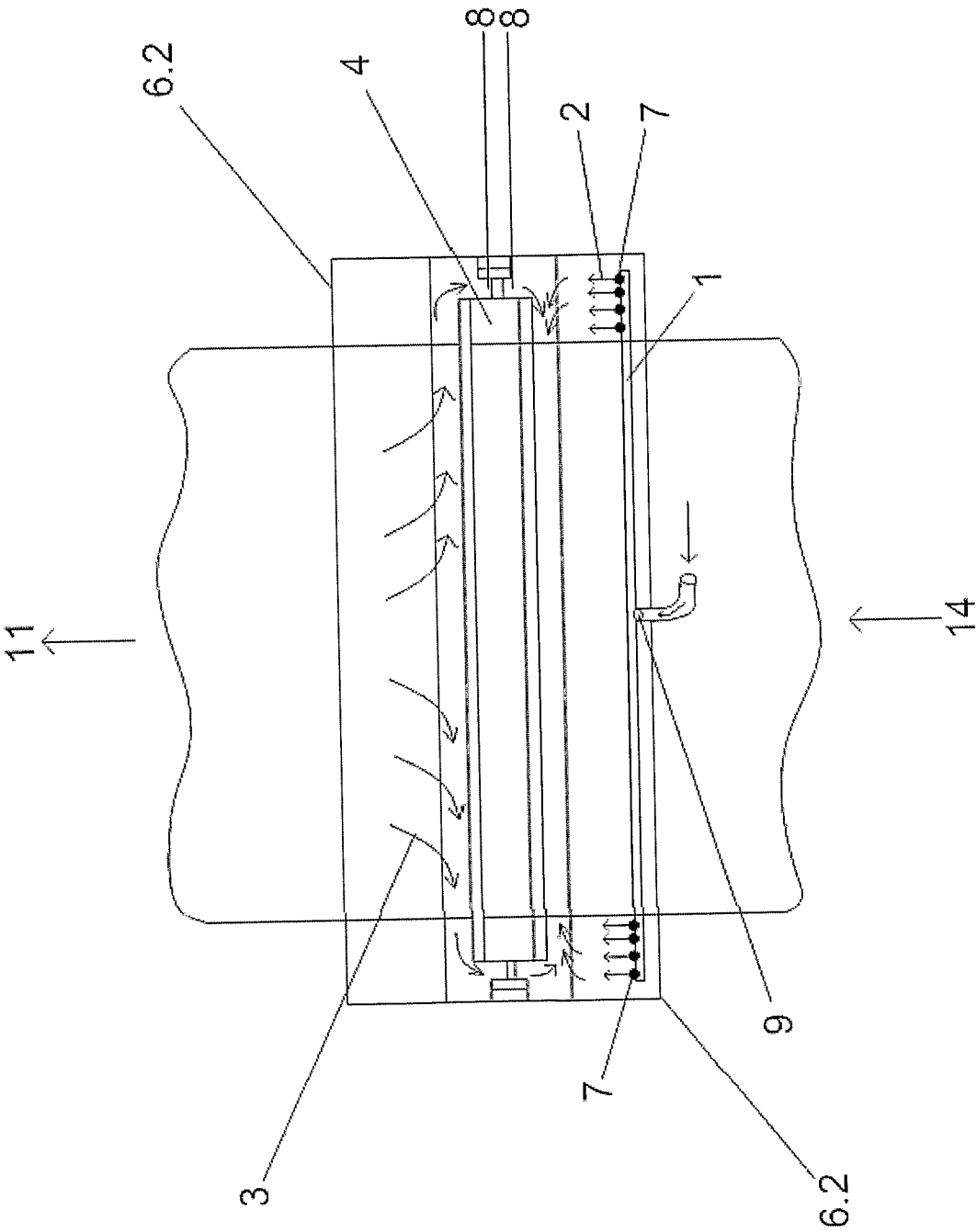


Figure-3

INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. D06B3/10 D06B3/18
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 347 235 A (JOHN HUDSON HEAP) 27 April 1931 (1931-04-27) page 6, line 64 - page 7, line 9; figures 1,2	1-9
A	GB 388 290 A (CONRAD FRUEH) 23 February 1933 (1933-02-23) the whole document	1-9
A	GB 249 406 A (THOMAS MCCONNELL) 25 March 1926 (1926-03-25) the whole document figure 4	1-9
A	GB 06486 A A.D. 1909 (DEAN JOSEPH) 19 August 1909 (1909-08-19) page 1, lines 39-43	1-9
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Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

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18/06/2010

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INTERNATIONAL SEARCH REPORT

International application No
PCT/TR2010/000037

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 404 605 A (SAMILO JOHN S [US]) 11 April 1995 (1995-04-11) the whole document -----	1-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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