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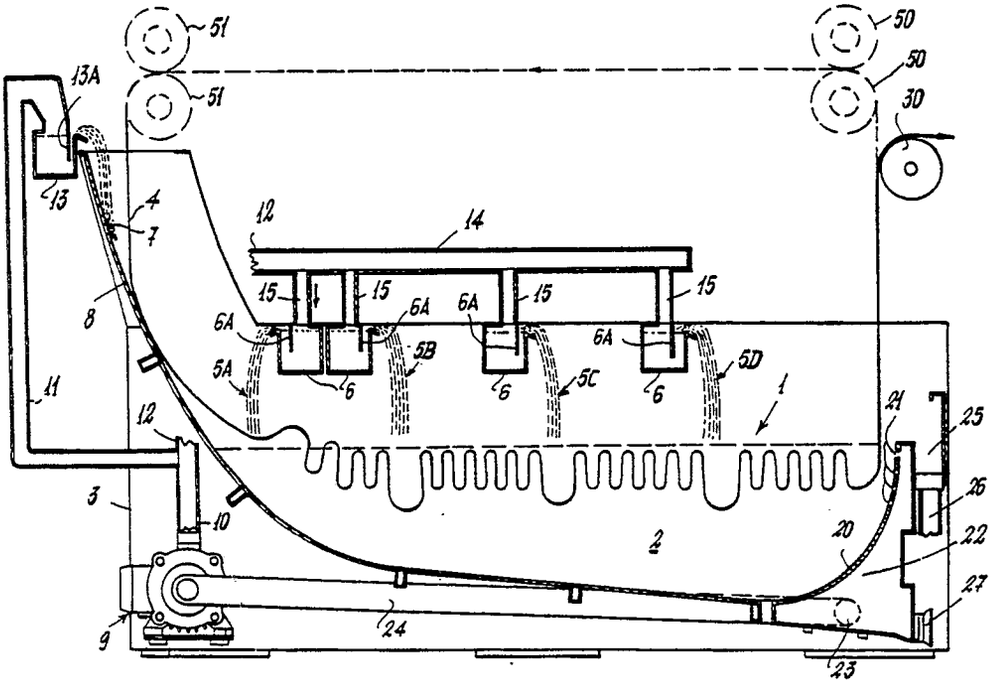
(54) Machine for scouring fabrics in open width, in particular for delicate fabrics.

(57) A machine for scouring fabrics, in particular for delicate fabrics, comprises a tank (1) for the treatment liquid or liquids (2); the fabric (4) is subjected during washing to the action of a series of sheets or cascades of liquid (5A, B, C, D) which create a discontinuity in the folds of the folded fabric. This prevents the formation of deformations in the fabric (4) at the vertices of the folds, which deformations could remain permanently even after the usual finishing of the fabric (4).



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This invention relates to a machine for scouring fabrics in open width, in particular for delicate fabrics. In this context scouring means both the washing and rinsing of fabrics.

There are various known machines for the continuous or batch scouring of fabrics in open width. In particular, for the more delicate fabrics (such as wool or mixed wool, artificial fibres and the like) machines are used for open width scouring in which the treated fabric is folded, ie compacted into folds. For example, the fabric is made to fall by known systems onto an inclined surface where the folds form, or is driven by a roller along apertured conveyor belts through which water jets are fed so that they strike the fabric on both sides, so creating the folds and simultaneously acting as the scouring means.

In all scouring machines in which the fabric is folded there is a common main drawback, in that the folds do not vary their position during the fabric scouring with the result that deformations form in the fabric thereat, which are difficult to remove during finishing.

Furthermore, the folds are sometimes so close to each other as not to allow very efficient scouring of the fabric.

An object of the present invention is therefore to provide a machine for scouring (to also include chemical treatment, such as the treatment of cotton fabrics with caustic soda) of fabrics in open width, in particular for delicate fabrics, in which the aforesaid drawbacks of the machines of the state of the art are not present.

A particular object of the invention is to provide a machine for the scouring and chemical treatment of fabrics in open width in which the folds undergo continuous modification during the course of the treatment.

These and further objects which will be apparent to the expert of the art are attained by a machine for the continuous or batch scouring of fabrics in open width, in particular of delicate fabrics, comprising a treatment tank in which a treatment liquid is present, characterised by comprising a succession of sheets or cascades of liquid which strike the underlying folded fabric during treatment, so modifying the fold arrangement. In particular, a sheet of liquid strikes the fabric before its immersion into the treatment tank, said fabric being conveyed into the liquid by a chute of liquid which slides along an inclined wall of the tank.

The present invention will be more apparent from the accompanying drawing which is given by way of non-limiting example, and of which the single figure represents a diagrammatic side sectional view of the machine according to the invention.

With reference to said figure, the continuous or batch scouring machine according to the invention comprises a treatment tank 1 in which a liquid such as a conventional scouring liquid 2 is present, said tank being supported by a support 3 and comprising a base 1A.

According to the invention the fabric 4 to be scoured and which is folded into folds during the scouring, which takes place in the tank 1, is struck by sheets or cascades of watery liquid 5A, B, C, D originating from overflow tanks 6 positioned above the treatment tank 1, said fabric 4 being introduced into the tank 1 by a chute of liquid 7 running along an inclined wall or chute 8 of said tank.

Specifically, the machine of the invention comprises at least one liquid recirculation pump 9 positioned to the side of the tank 1, and from which a delivery pipe 10 extends to branch into a first and second pipe 11 and 12. The first pipe 11 terminates in a overflow tank 13, which has a length (perpendicular to the plane of the drawing) equal to or greater than the height of the fabric, and is located at the upper end of the wall 8 of the treatment tank 1. The second pipe 12 extends to position its end portion 14 above said treatment tank.

The liquid to form the chute 7 falls from the overflow tank 13, whereas vertical channels 15 branch from the portion 14 to terminate in the overflow tanks 6, from which the sheets of liquid 5 fall, their length (perpendicular to the plane of the drawing) being equal to or greater than the height of the fabric.

To prevent the liquid which reaches the overflow tanks 13 and 6 through the pipe 11 and the channels 15 creating turbulence in the liquid overflowing from them, baffles 13A and 6A are positioned respectively in said tanks, in proximity to the discharge from which the liquid overflows. Advantageously the overflow tanks 13 and 6 are closed in the regions in which they are connected to the pipe 11 and channels 15 respectively, whereas they are obviously open in the discharge regions from which the liquid overflows to fall into the tank 1.

In that side 20 of the tank 1 opposite the wall 8 along which the chute 7 is present there are provided apertures 21 through which the treatment liquid passes into a closed chamber 22 which is connected at 23 to a suction pipe 24 terminating at the pump 9. To the side of the treatment tank 1 there is also provided a further chamber 25 from which a pipe 26 extends to carry into the chamber 22, via a further pipe 27, the excess liquid which overflows into the chamber 25 from the tank 1.

It will now be assumed that the fabric 4 originating from a feed line (not shown) is to be scoured.

To undergo this scouring the fabric is made to fall onto the chute 7 present on the wall 8 of the

treatment tank, and is then dragged into the scouring solution 2.

Because of the chute 7, no premature folding of the fabric occurs. To prevent any folding occurring before it enters the solution 2, the fabric is struck in proximity to this solution by a first sheet or cascade of liquid 5A originating from the respective overflow tank 6. Following this, the fabric is urged towards the scouring solution 2, the subsequent impact of the fabric 4 with said solution creating a first fold. This fold is followed by further folds 6, creating a sequence of successive folds along the fabric immersed in the scouring solution 2.

As the subsequent sheets or cascades of liquid 5B, C, D strike the fabric they further urge it towards the base 1A of the tank 1 to each cause an interruption in and a successive restarting of the fold sequence. In this manner a discontinuity is created in the succession of folds to prevent the formation of those deformations which occur whenever the arrangement of such folds is repeated in the fabric in a constant and permanent manner, as occurs in existing machines.

Finally, the fabric 4 is extracted from the tank 1 by known means (such as a tractor roller 30) and fed to other working stations. Alternatively, the fabric can be returned to the tank 1 for further scouring.

As already stated, the sheets or cascades of liquid 5A, B, C, D and the chute 7 are fed by the pump 9. This pump (which is advantageously and preferably paired with an analogous pump positioned on the other side of the tank 1 and connected to pipes analogous to those connected to the pump 9 and terminating in the overflow tank 13 and pipe 12) draws via the pipe 24 the scouring liquid which has reached the chamber 22 from the tank 1, and feeds it through the pipe 10 and then through the pipes 11 and 12 to the tanks 13 and 6. Finally, the water emerges from these tanks to form said sheets 5A, B, C, D and chute 7.

Finally, nozzles in elongated slot form (not shown) can be provided in the base 1A of the tank 1 to feed the treatment liquid under pressure towards the fabric 4 present in the scouring solution, in order to disturb the fold arrangement.

Finally, it should be noted that the pump or pumps 9 are of variable throughput in order to be able to feed a number of liquid sheets or cascades 5A, B, C, D which varies according to the length of the treatment tank 1, and to feed these liquid sheets with a variable quantity of fluid depending on the fabric (light or heavy).

A machine constructed in accordance with the present invention enables the position of the folds in the fabric to be varied during the time in which it is undergoing treatment in the tank 1, so preventing permanent deformations, which could damage the fabric, arising at said folds.

As shown indotted lines the invention includes an embodiment wherein the fabric 4 forms an annulus by sewing its end parts and the fabric is repeatedly treated in the same tank by being guided by return cylinders 50, 51 which can be actuated so to impart movement to the fabric.

Claims

1. A machine for the continuous or batch scouring of fabrics in open width, in particular of delicate fabrics, comprising a treatment tank in which a treatment liquid is present, characterised by comprising a succession of sheets or cascades of liquid (5A, B, C, D) which strike the underlying folded fabric (4) under movement during treatment, so modifying the fold arrangement.

2. A machine as claimed in claim 1, characterised in that a sheet or cascade of liquid (5A) strikes the fabric (4) before its immersion into the treatment tank (1), said fabric (4) reaching the liquid along a liquid chute (7) which slides along an inclined wall (8) of said tank (1).

3. A machine as claimed in claim 1, characterised in that the sheets or cascades of liquid (5A, B, C, D) originate from overflow tanks (6) positioned above the treatment tank (1), said overflow tanks (6) being fed by at least one pump (9), advantageously of variable throughput, which recirculates liquid from the treatment tank (1) to said overflow tanks (6).

4. A machine as claimed in claims 1 and 3, characterised in that the liquid chute (7) along the wall (8) of the treatment tank (1) originates from an overflow tank (13) positioned at the upper end of said wall (8), said overflow tank (13) being fed by the recirculation pump (9).

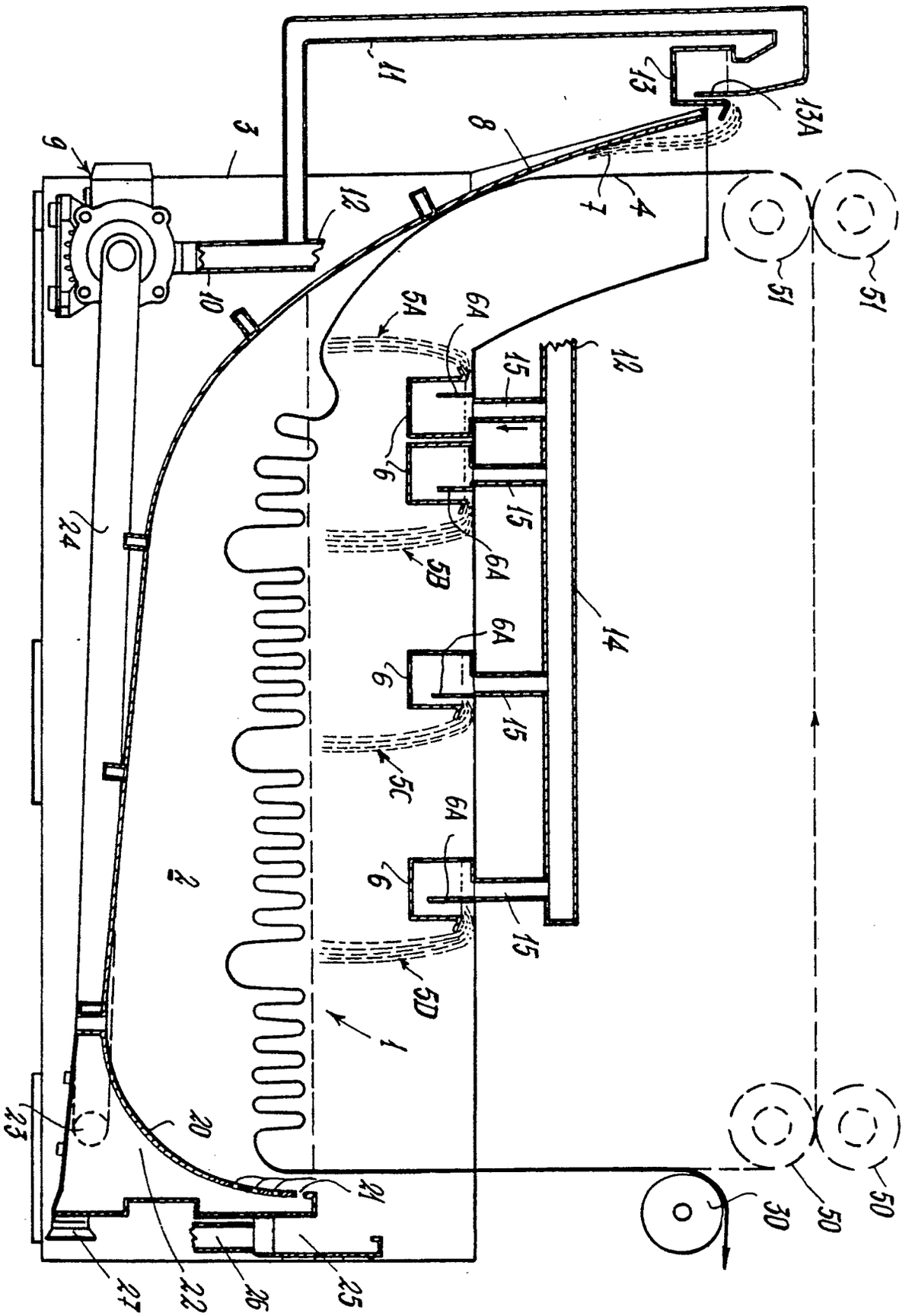
5. A machine as claimed in claims 3 and 4, characterised in that the recirculation pump (9) has a delivery pipe (10) which branches into a first and second pipe (11, 12), the first pipe (11) reaching the overflow tank (13) from which the liquid forming the chute (7) emerges, and the second (12) terminating in a portion (14) which is positioned above the treatment tank (1) and from which channels (15) extend to terminate in the overflow tanks (6) positioned above said treatment tank.

6. A machine as claimed in claim 5, characterised in that the recirculation pump (9) is associated with a suction pipe (24) extending from a chamber (22) which the treatment liquid (2) reaches through apertures (21) provided in a side (20) of the treatment tank (1) which divides this latter from said chamber (22).

7. A machine as claimed in claim 1, charac-

terised by comprising in the base (1A) of the treatment tank (1) at least one nozzle of elongated slot form for feeding the treatment liquid against the fabric (4) present in said tank (1).

8. A machine as claimed in claim 1, characterised by the fact that it comprises return cylinders (50,51) for returning the fabric at least some of which are actuated.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EUROPEAN SEARCH REPORT

Application Number

EP 90 10 3007

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-A-2553305 (GUILLOT) * the whole document *	1-7	D06B3/16 D06B1/04
X	US-A-3990274 (TEIJIN) * the whole document *	1	
X	GB-A-2059471 (ARIOLI) * the whole document *	1	
A	US-A-3509746 (CILANDER)		
A	DE-A-2502998 (BOCO WÄSCHEDIENST ERNST RETHWISCH)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

D06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 JUNE 1990	PETIT J.P.

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