ABSTRACT OF THE DISCLOSURE

A machine for singeing textiles is provided with burners producing flames that are played upon one face of the fabric which travels through the machine around rollers which support the fabric to form two pockets with one portion of the fabric serving as a common wall between the pockets. At the entrance to each pocket, a burner is placed to simultaneously singe two separate areas on one face of the fabric with the burner at the first pocket singeing one face of the fabric, and the burner at the second pocket singeing the opposite face of the fabric. This invention relates to flame-singeing machines for the treatment of textile materials.

In the past it has been usual to singe runs of textile fabric by passing them over sets of three staggered rolls or guides to form either a shallow inverted V or a singeing flame playing directly onto the body of the material at the apex of the V or a deep pocket the length of which was many times the depth of the pocket and into which pocket the singeing flame was played.

Such apparatus was only capable of singeing one side of the material at one pass and apparatus using two sets of rolls and two flames was employed to singe both faces at one pass. In practice, to singe both faces evenly at one pass, the reason for this difficulty lies in the fact that the moisture in the fabric entering the machine retards the rise in temperature of the material such that only partial singeing is possible as the material passes through the first flame.

When the dried material is reversed and meets the second flame the temperature rise is faster and the material is singed more thoroughly on the reversed surface.

It is an object of this invention to show how this disadvantage may be overcome.

It is another object of this invention to enable synthetic fabrics with relatively low melting points to be singed successfully.

The invention will now be described with reference to the accompanying drawings which is a schematic diagram of a side elevation of the singeing machine.

The invention is an improvement upon flame singeing machines of the type commonly stationed in a line of apparatus arranged to treat cloth that moves continuously and emerges from the line as finished cloth.

The machine frame comprises a pair of spaced prefabricated steel box members 4 rigidly connected near their respective mid-points by a braced bed 6. The internal faces of the box members provide mountings for a front pair of rolls 8 just above the frame bed 6 and a rear pair of rolls 10 just above the frame bed. These constitute the lower rolls. There are three upper rolls 12 similarly supported, midway between the front and rear rolls and two to three feet above the latter. The rolls are steel cylinders of 3 inch outer diameter.

Midway between the centre upper roll 12 and the rearmost and foremost rolls 8 and 10 there is in each side plate 4, slots 16 through which stroker wires 18 run. The stroker wires 18 primarily exist to cause the fibres of the fabric to project from the surface of the fabric so that they may be more easily removed by singeing. The secondary purpose of the wires is to create a diverging pocket when the fabric is threaded over the rolls.

The right hand box member 4 houses an air supply conduit (not shown). The conduit is supplied with air at a pressure of 450 millimeters of water by an electrically driven compressor (not shown). The same box member also houses a conduit which conducts town gas to a mixing valve (not shown) where the gas is mixed with suitable proportions of air. The gas supply contains a solenoid operated valve capable of closing off the gas supply, the reason for which will appear later in this description.

The air conduit has front and rear outlet pipes 20 and 22 which feed air to a front burner bar 24 and a rear burner bar 26 each being situated between and beneath the front and rear lower rollers 8 and 10, respectively. The burners 24 and 26 extend transversely over the full width of the rolls and each has a slotted neck in the upper surface so as to produce a flat sheet of flame which passes up between the respective pair of rolls.

The left hand box member 4 houses a centrifugal fan 28 having capacity of 4000 cubic feet per minute, the inlet 29 of which communicates with the interior of the member 4. The inlet 29 also communicates with the interior of the right hand box member by means of a duct 30 joining the two members. Both box members have a pair of inlets 32 situated on their respective internal faces, just above the uppermost fabric run.

The products of combustion which are produced within the pockets 34 and 36 may only escape from the sides of the pockets and as they do so they are drawn into the inlets 32 by the surrounding air which during operation, moves past the sides of the pockets.

The extractive action of the fan is enhanced in two ways. Firstly, in each pocket there is a scavenger pipe 38, 48 which is supplied with air under pressure. Each pipe is located parallel to the rolls and toward the upper part of the respective pocket. The scavenger pipes each have a slot therein, facing their respective burners and the pressure of the air emanating from the slots is adjusted so as to confine the flame to the lower part of the pocket and to spread it over the fabric and furthermore to create an excess pressure within the pocket thereby causing the products of combustion to leave the pocket, whereupon they are collected by the fan.

Secondly, the space from which the fan draws air is reduced by arranging feed rolls 42 for the incoming fabric, above the machine and threading the fabric over them to form a large pocket with the open end facing the exit side of the machine. The products of combustion usually include fine soot and it is important that this be directed toward the inlets of the box members.

In one example of the use of the invention, the singeing machine is stationed in a line of apparatus, each unit of the apparatus being employed to provide a separate function or perform a separate phase of the treatment of the cloth web. At the exit end of the line, there is a pair of driven draw nip rolls which have the task of pulling the cloth through the machines in advance of it.

In an assembly of such apparatus, the cloth, for example, is first drawn from a plaited stack over three staggered drying cylinders, then through a brush box which raises the nap on both faces of the cloth, then through the singeing machine then over two plates of a plate singeing machine, then through a water-mist spray unit then through a steam box, then finally through a water box situated next to the draw nip rolls.

When the cloth begins to move through the assembly, such movement is detected by a speedometer which is linked to the solenoid operated valve in the air/gas supply. Once the cloth is moving above a preselected velocity the supply is available and ignited by a push-button control. Uniform flames immediately issue from the two burners.
and these are adjusted for size according to the rate of throughput of the cloth. The stroker wires augment this control by allowing the distance between the flame and the cloth downstream of the flame to be varied. The width of each flame is adjustable from both ends to accommodate differing widths of cloth.

I have found the advantages of the above embodiment to be as follows. The creation of two pockets both having a common wall allows heat from both burners to play upon the common fabric wall.

The fabric defining the first part of the pocket is dried as it recedes from the first burner and is singed as it approaches the first burner on the return journey. The reverse face of the fabric is subjected to similar treatment during a double journey over the second burner.

The heat used in driving moisture from the fabric and the heat absorbed by the fabric itself constitute a load that is shared by the two burners and an even singe on both faces results. Should the speedometer detect movement which is slower than a preselected minimum the solenoid valve is actuated automatically and the gas supply to the burner is cut off.

The degree of control possible on the machine permits efficient singeing of synthetic fabrics of low melting point, for example, materials of acrylic fibre. Throughput speeds of up to 200 yds./minute are possible.

What I claim is:

1. A textile flame singeing machine of the type comprising a plurality of sets of spaced rollers arranged to support a textile fabric for travel through the machine, a set of said rollers disposed at the entrance and at the exit of the machine, and an intervening set of rollers therebetween, the fabric being trained around the rollers to form two pockets, the first pocket at the entrance end and the second pocket at the exit end, respectively, of the machine with one portion of the fabric forming a common wall between the pockets, and a burner at the entrance of each pocket to play a flame on the opposed interior walls of the pocket, whereby the burner at the entrance to the first pocket simultaneously singes two separate areas on one face of the fabric and the burner at the entrance to the second pocket simultaneously singes two separate areas on the other face of the fabric whereby an even singe is obtained on both faces of the fabric.

2. The improvement according to claim 1, further including means positioned within each pocket to remove gases from the pocket.

3. The improvement according to claim 2, further including a stroker wire situated in each pocket to bear on the face of the fabric and raise its fibers, the stroker wire being movable transversely to the face upon which the wire bears.

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