Aug. 22, 1961 T. F. SUGGS 2,996,785

APPARATUS FOR PREVENTING SIZE ACCUMULATION ON SIZE BOX ROLLS

Filed Jan. 6, 1959

FIG. 1.

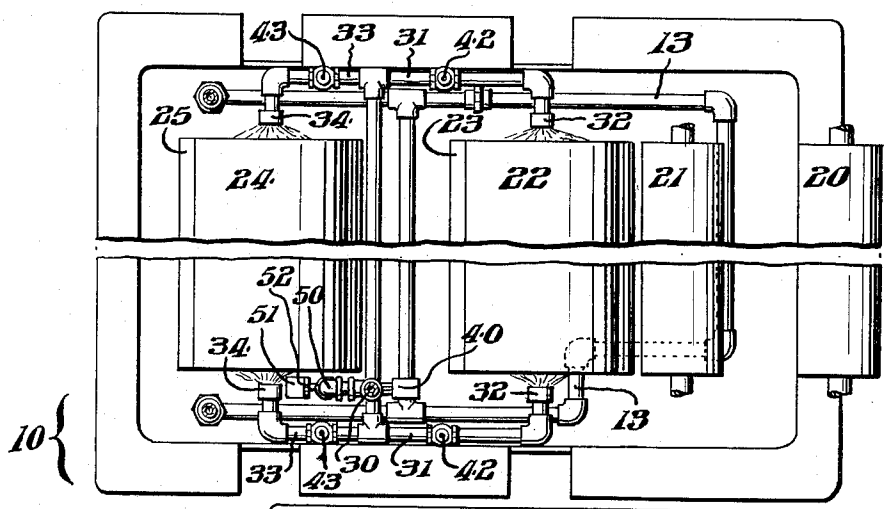


FIG. 2.

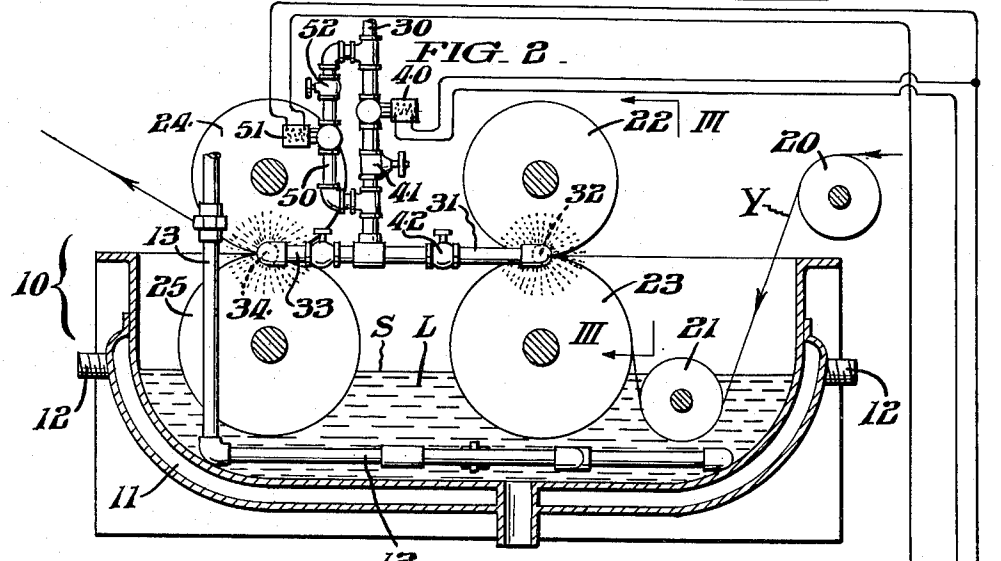
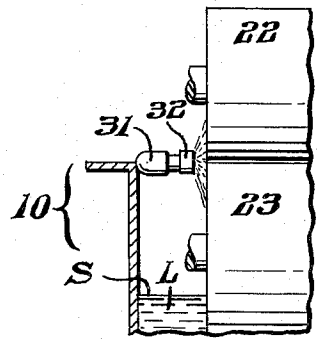
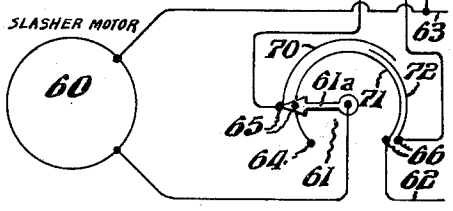


FIG. 3.





INVENTOR.
Thomas F. Suggs,
BY Paul & Paul
ATTORNEYS.

United States Patent Office 2,996,785 Patented Aug. 22, 1961

2,996,785

APPARATUS FOR PREVENTING SIZE ACCUMULATION ON SIZE BOX ROLLS

Thomas F. Suggs, Gastonia, N.C., assignor to Cocker Machine & Foundry Company, Gastonia, N.C., a corporation of North Carolina

Filed Jan. 6, 1959, Ser. No. 785,192
5 Claims. (Cl. 28—28)

This invention relates to size boxes for applying size to textile materials, and more particularly to size boxes having reservoirs containing heated liquid size, into which yarn, fabric or any other solid sheet material is immersed, in order to impregnate the sheet with the liquid. More specifically, this invention relates to slashers in which a sheet of a plurality of parallel ends of yarn is treated with a heated liquid such as size or the like, in order to impart strength to the yarn.

Conventionally, size boxes operate with one or more rolls in a submerged or partially submerged condition, and as the roll rotates, size is picked up and lifted on the surface of the roll. Concurrently, size is squeezed out of the material and, in continued operation, some of the size tends to flow down along the end of the size box roll, ultimately reaching a position (such as the end of the roll, for example) where the temperature is considerably lower than the temperature at which the liquid size congeals. As further size is continuously squeezed out of the yarn, it is forced to flow over the ends of the roll, and congealed or solidified size gradually accumulates. When the accumulation becomes sufficiently large the centrifugal force created by the speed of the roll throws the solid, congealed size off the roll. This is a source of trouble and annoyance.

It is accordingly an object of this invention to provide an apparatus which overcomes the foregoing disadvantages. Still another object of this invention is to provide a novel means for eliminating the accumulation of solid size on the ends of the rolls of the size box.

A more specific object of this invention is to counteract the effect of the size or starch that is squeezed off the yarn or cloth in the course of operation of the size box, eliminating the congealing of size on the ends of the roll, with reliability and economy.

Still another object of this invention is to provide an apparatus for eliminating the congealing effect just referred to, which apparatus operates selectively in accordance with the speed of operation of the size box, in order to provide efficient and economical operation at a variety of speeds.

Still another object of this invention is to provide an apparatus of the character just indicated, which includes an automatic means for disconnecting the anti-congealing apparatus when the size box is stopped.

Other objects and advantages of this invention will further become apparent hereinafter and in the drawings whereof:

FIG. 1 is a plan view of a specific form of apparatus constructed in accordance with this invention, with the shafts of the nip rolls removed in order to illustrate the steam jets more clearly,

FIG. 2 is a side elevation of the apparatus of FIG. 1, with certain of the parts shown in section, and also including a diagrammatic disclosure of the driving and controlling means for the size box and for the apparatus which eliminates congealing of size, and

FIG. 3 is a partial sectional view taken as indicated by the lines and arrows III, III which appear in FIG. 2.

The following description is directed to the specific form of the invention as illustrated in the drawings, and is not intended to limit the scope of the invention which is defined in the appended claims.

Turning now to the specific form of the invention selected for illustration in the drawings, the number **10** designates a size box containing size liquid L having an upper surface S. The size box is provided with a heating jacket **11** fitted with steam connections **12** for maintaining the starch or size in a liquid condition. The size box **10** is also provided with a plurality of boil pipes **13** which contain steam and which may be perforated in order to introduce steam in controlled and distributed quantities into the size.

Fixed upon shafts and supported for rotation thereon are a feed roll **20**, an immersion roll **21**, upper and lower quetsch rolls **22, 23**, and another pair of upper and lower quetsch rolls **24, 25**. As appears in FIG. 2, the yarn Y passes over the roll **20** and under the immersion roll **21**, which extends beneath the surface S of the liquid size L. The yarn then moves upwardly through the nip between the quetsch rolls **22, 23**, and then moves generally horizontally through the nip between the quetsch rolls **24, 25**.

Pipe **30** has branches **31** at each side of the size box, beyond the ends of the quetsch rolls **22, 23**. Each branch **31** terminates in a nozzle **32** constructed and arranged to direct a spray of steam against the end surface of each quetsch roll **22, 23**. Similarly, the pipe **30** has other branches **33**, each of which terminates in a nozzle **34** arranged for directing a spray of steam against the corresponding end surfaces of the quetsch rolls **24, 25**.

The steam pipe **30** is provided with a solenoid valve **40**, and a reducing valve **41**, while the branches **31** are provided with throttling valves **42**. All such valves control the flow of steam to the end walls of quetsch rolls **22, 23**. Similarly, the branches **33** are provided with throttling valves **43**, through which steam flows from the pipe **30**.

The pipe **30** is also provided with a by-pass **50** having a solenoid valve **51** and a controlling valve **52**. Both solenoids **40** and **51** are connected electrically to the apparatus which operates the size box, as will further appear.

Referring particularly to FIG. 2, the number **60** designates a slasher motor which is operated by an electric rheostat **61** connected by lines **62** and **63** to a source of electric current. Rheostat **61** has a contact arm **61*a*** and has a terminal **64** representing an off position, a terminal **65** representing crawl speed, and a terminal **66** representing full running speed. The numbers **70, 71** and **72** represent electrically conducted strips which are in contact with the arm **61*a***. The terminal **65** is connected electrically through the solenoid **51**, the terminal **66** is connected electrically through the solenoid **40**, and the terminal **64** is free of any connection to either of such solenoids.

In operation, the size liquid is brought to a proper temperature and the slasher is started by swinging the arm **61*a*** into contact with the contact point **65**, thereby throwing the slasher motor **60** into crawl speed. Concurrently, electric current passes through the arm **61*a*** to the solenoid **51**, thereby opening the solenoid and permitting a limited flow of steam to flow through the by-pass **50** and through the nozzles **32** and **34**. When the arm **61*a*** is turned in a clockwise direction, it ultimately makes contact with both strips **70, 72** and this energizes the solenoid valve **40**, opening it, while the solenoid valve **51** remains open. Steam flows through the main pipe **30** at a much greater rate of speed than through the by-pass **50**, the valves **41, 52** being so adjusted. Accordingly, the flow of steam through the nozzles **32, 34** is increased. As the arm **61*a*** moves further clockwise, toward and to the terminals **66**, the arm **61*a*** becomes disconnected from the strip **70**, thereby permitting the solenoid valve **51** to close,

and the flow of steam is that which is obtained through the main pipe **30** and solenoid valve **40**.

Accordingly, it will be appreciated that means are provided for varying the flow of steam from the nozzles **32**, **34** automatically in relation to the rate of speed of operation of the slasher or of the size box. It will be appreciated that the slasher motor **60** may instead be a motor connected to drive the rolls in the size box, and that the interconnection between the speed of operation of the size box and the rate of flow of steam may readily be accomplished in a wide variety of ways.

The automatic controlling apparatus just described is important and advantageous since the steam is reduced in quantity when the slasher is reduced in speed, and is shut off entirely when the slasher is stopped.

Although the steam nozzles may be located in a variety of positions, it is preferred to direct the steam against the ends of the rolls, in such a manner to obtain a heating effect on a substantial surface area of the end of the roll. The specific location shown in the drawings is further advantageous because the steam impinges upon the end of the roll at the location where the size is being squeezed out of the yarn.

Although this invention has been disclosed with reference to a specific form thereof, it will be appreciated that various modifications may be made without departing from the scope of this invention. For example, various combinations and arrangements of rolls may be substituted, equivalents may be utilized, parts may be reversed, and certain features may be used independently of other features, all without departing from hte scope of the invention.

Having thus described my invention, I claim:

1. In a slasher apparatus having a size box containing liquid size and a plurality of rotatable rolls arranged in contact with one another, at least one of which is in contact with the liquid, one of said rolls having a surface portion which is in an exposed position and is located above the surface of said liquid size, the combination which comprises drive means for said slasher, means for drawing a sheet of textile material under the surface of said size and through the nip of said rolls, means for applying pressurized steam to an exposed surface portion of one of said rolls at a location above the surface of said liquid size, preventing solidification and accumulation of solid size on said surface of said roll, and control means connected to said drive means and to the steam applying means for shutting off said steam in response to a stopping of said drive means.

2. In a slasher apparatus having a size box for applying a liquid to an elongated solid material, said size box having a reservoir containing liquid size and having a plurality of rotatable rolls arranged in contact with one another, at least one of which is in contact with the elongated solid material, one of said rolls having a surface portion which is in an exposed position and is located above the surface of said liquid size, the combination which comprises drive means for said apparatus, means for drawing said elongated solid material under the surface of said size and on one of said rolls, means for applying pressurized hot vapor to an exposed surface portion of one of said rolls at a location above the surface of said liquid size, thereby preventing solidification and accumulation of solid size on said surface of said roll, speed control means connected to operate said size box roll at different speeds, vapor rate control means connected to regulate the flow of said hot vapor at different rates, and connecting means between said speed control means and said hot vapor rate control means to produce a change of flow of hot vapor in response to a change of speed of said apparatus.

3. In a slasher apparatus having a size box conntaining liquid size and having a plurality of rotatable rolls arranged in contact with one another, at least one of which is in contact with the liquid, the combination which comprises means for drawing yarn under the surface of said size and through the nip of said rolls, means for applying steam to the nip of said rolls, said means including a main pipe, a by-pass pipe and valve means for opening and closing said pipes, speed control means connected to control the speed of operation of said apparatus, and means connecting said speed control means to said valve means for switching from one of said pipes to the other in response to a change of said speed.

4. In a size box containing liquid size and having a rotatable roll which includes a surface portion located in an exposed position above the surface of said liquid size, the combination which comprises means for drawing sized textile material along the surface of said roll and means for applying a hot vapor to an exposed surface portion of said roll at a location above the surface of said liquid size, said means including a pair of nozzles arranged adjacent the periphery of said roll, located at opposite ends thereof, and directed toward each other.

5. In a size box having a reservoir containing liquid size and having a plurality of rotatable rolls arranged in contact with one another, at least one of which is in contact with the liquid, one of said rolls having a surface portion which is in an exposed position and is located above the surface of said liquid size, the combination which comprises means for drawing yarn under the surface of said size and through the nip of said rolls, and means for impinging hot vapor on the end surfaces of both of said rolls in the area of their nip, said vapor impinging means including a pair of nozzles arranged adjacent the peripheries of said rolls and at the opposite ends thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

128,395	Higgins	June 25, 1872
646,787	Aykroyd	Apr. 3, 1900
1,948,646	Bruenn	Feb. 27, 1934
2,795,839	Seawell	June 18, 1957

FOREIGN PATENTS

19,256	Great Britain	1897