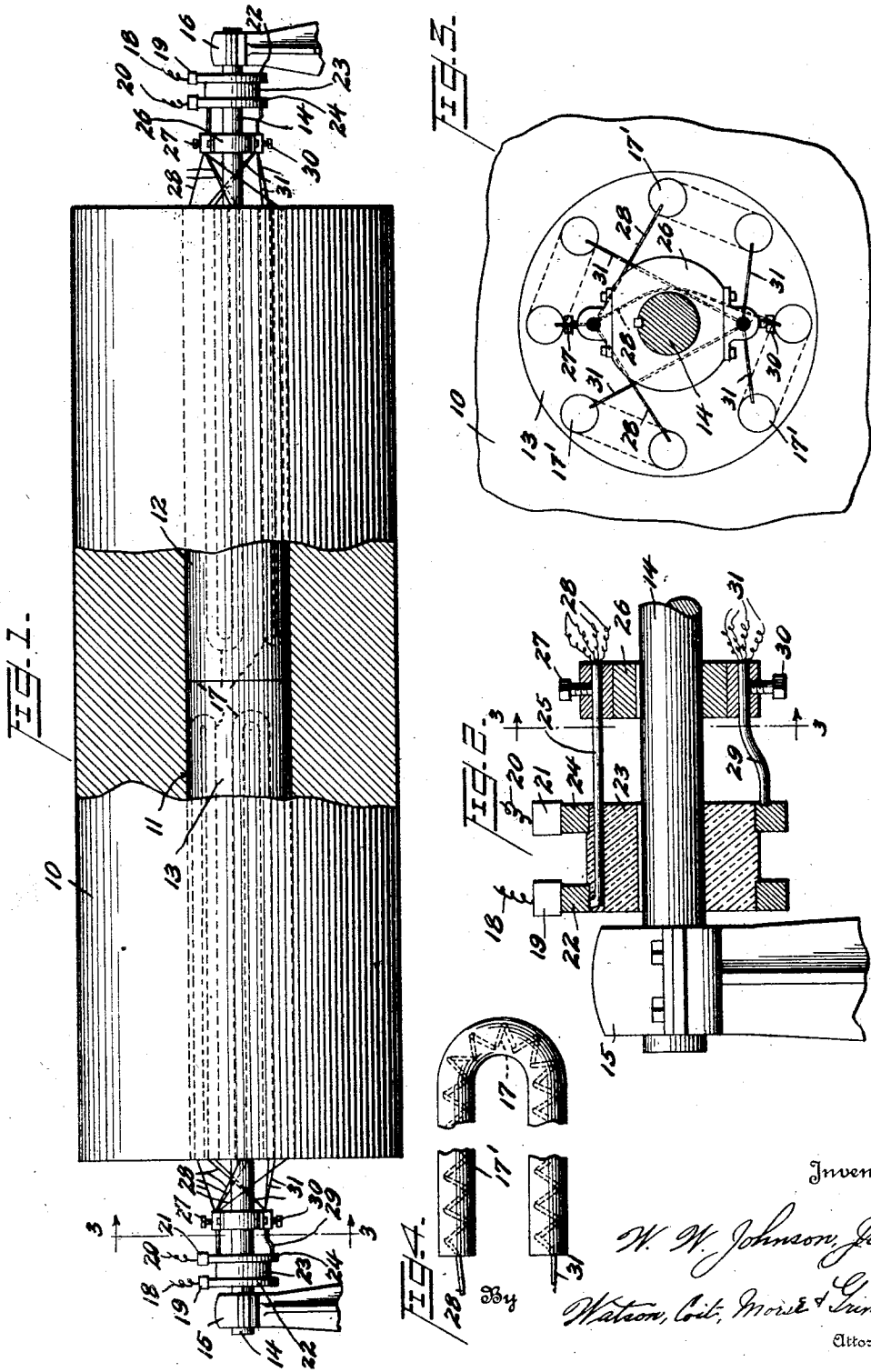


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HEATER FOR SCHREINER ROLLS

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HEATER FOR SCHREINER ROLLS.

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To all whom it may concern:

Be it known that I, WILLIAM W. JOHNSON, Jr., a citizen of the United States, and residing at Eddystone, county of Delaware, State of Pennsylvania, have invented certain new and useful Improvements in Heaters for Schreiner Rolls, of which the following is a specification.

This invention relates to calender or Schreiner rolls such as are used for finishing cotton or other fabric, for the purpose of giving a lustre and particularly to the heating means in such rolls. It is designed and intended to provide simple, practical and efficient means whereby all parts of the surface of the roll, both longitudinally and peripherally, may be easily and accurately brought to and maintained at a pre-determined temperature which is necessary or best adapted to produce the desired effect upon the fabric being treated. The systems heretofore commonly used for heating such rolls have been found defective in various ways, due in some cases to the structure of the roll and in others to the nature or arrangement of the heating means and to other causes. It has been found difficult for instance to maintain the desired temperature and to cause it to be uniform throughout and with most systems the central portion of the roll is heated to a higher degree of temperature than the end portions. The present invention contemplates the use of electric heating units so formed and arranged as to most effectively produce and maintain substantially uniform temperature at all parts of the surface of the roll and which can be easily regulated and controlled. One of its novel and important features is that the heating units extend longitudinally from the ends, but are spaced from each other at the longitudinal center of the roll. It includes novel structural features by which the roll proper and the heating elements may be easily and conveniently assembled and mounted on the rotary supporting shaft. It also contemplates the use of a solid steel roll with a central bore which is not subject to sudden local changes in temperature and which has all of the requisite strength and lasting qualities to stand the strain of use. The novel features will be more fully understood from the following

description and claims taken with accompanying drawing.

In the drawing:

Figure 1 is a side view of a roll embodying the invention partly in vertical section;

Figure 2 is an enlarged vertical longitudinal section through the contact arrangement on the shaft which is connected to the heating units of the roll.

Figure 3 is a vertical section on the line 3—3 of Figure 2 looking to the right; and

Figure 4 is a detached plan view of one of the electric heating units detached but partly broken away.

In the specific embodiment of the invention shown for purpose of illustration the cylinder 10 is made of steel and may be approximately 12 inches in diameter. It has a central longitudinal opening or bore 11 which is cylindrical in form and is of solid metal from the bore out to the circumference. The heating units are mounted in cylindrical carriers 12 and 13, which are preferably made of cast iron, and which are duplicates of each other fitting in the central bore from opposite ends and completely filling that bore with the inner ends abutting thus forming a central core for the main roll 10. The carriers 12 and 13 have a central bore through which the supporting shaft 14 passes and are so connected to it as to rotate with it. The shaft 14 is rotatively supported in suitable bearing supports 15 and 16 as is well known in the art. A series of electric heating units 17 extend longitudinally of each of the core members 12 and 13 from a point of their outer ends to a point near their inner ends and are preferably inclosed in pipes 17', which are of U shape, in longitudinal outline with the sides of the U close together parallel with the outer surface of the core and embedded in it. As shown in the drawing there are four heating units in each core section arranged symmetrically around the center and near the outer surface and thus close to the inner surface of the roll 10. Since each series terminates a short distance from the inner end there is a longitudinal center portion of the roll which contains no heating element but it will be understood that this portion of the roll will derive its heat from the adjacent heated portions by conduction and

this spaced arrangement of the heating means prevents the central longitudinal portion of the roll from being over heated or more highly heated than the end portions.

5 The central bore is about $3\frac{3}{4}$ inches in diameter.

The electric current for the heating units is supplied from any suitable source by a line wire one end 18 of which is connected to the brush 19 and the other end 20 of which is connected to the brush 21. The brush 19 makes contact with the metal conducting ring 22 mounted on the sleeve 23 of non-conducting material which is keyed to the shaft 14 so as to rotate therewith and the brush 21 makes contact with the metal conducting ring 24 also mounted on the non-conducting sleeve 23 but spaced some distance from the ring 22. The conducting ring 22 is electrically connected to a conducting bar 25 which extends longitudinally of the shaft 14 and is secured to a non-conducting support 26 keyed to the shaft 4 by a screw 27 and it will be noted that this bar extends along the interior of the non-conducting sleeve 23 from the ring 22 and spaced inwardly from the ring 24. Wires 28 are connected to the end of this bar and one of these wires is connected to each of the electric heating units 17. The other ring 24 is electrically connected to the conducting metal bar 29 which is also secured at its other end to the support 26 by screw 30. A wire 31 electrically connects this bar with the other end of the wire in each heating unit. By this arrangement the current supplied will pass simultaneously through all of the heating units of the series in one section of the core. The arrangement for supplying the current is, of course, the same for both sections of the core and as shown the means for this purpose is mounted on the shaft at both ends beyond the ends of the roll. The conducting rings 22 and 24 rotating with the shaft and the roll while the brushes 19 and 20 are, of course, stationary and are mounted on the fixed frame of the machine by well known means not shown.

It will be noted that the construction of the main roll and of the heating cores is very simple and easy to make and to assemble and the symmetrical arrangement of the heating units entering from each end and extending horizontally parallel to the shaft by leaving an unheated short length of the roll at the center makes it possible to secure a more uniform temperature at the surface than has heretofore been found possible. Where a solid roll is used as in the form shown for purpose of illustration there is no possibility of unexpected local over heating and the temperature changes are gradual. The distance between the inner ends of the heating units of the two sec-

tions of the core is such that the heat at that part will be substantially the same as that of the parts surrounding the heating units because of the conduction of the heat from those parts. With this solid roll construction it is not in practice ordinarily necessary to supply current to the heating units at all times but the proper temperature may be maintained by supplying current at proper intervals since the roll, as stated above, changes in temperature very slowly. The construction by which the heating cores constitute complete entities entirely enclosing the series of heating units enables them to be brought to position in the main roll by a simple relative longitudinal movement. It is a very simple matter to change the roll when necessary in treating different grades of cloth.

Although one specific embodiment of the invention has been shown for purpose of illustration it is not limited to that particular form beyond what is indicated in the following claims.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. A cylindrical roll of the class described having electric heating units therein fixed to rotate therewith and extending longitudinally thereof from each end to a point near but spaced a short distance from the longitudinal center of the roll.

2. A cylindrical roll of the class described having a series of electric heating units therein extending longitudinally thereof from each end to a point near but spaced a short distance from the longitudinal center of the roll the units in each series being symmetrically arranged around the axis.

3. A cylindrical roll of the class described having a series of electric heating units therein extending longitudinally thereof from each end to a point near but spaced a short distance from the longitudinal center of the roll the units in each series being symmetrically arranged around the axis, and each series being mounted in fixed position in a carrier of approximately half the length of the roll adapted to be brought to position centrally of the roll by relative longitudinal movement.

4. A cylindrical roll of the class described having a series of electric heating units therein extending longitudinally thereof from each end to a point near but spaced a short distance from the longitudinal center of the roll the units in each series being symmetrically arranged around the axis, each electric heating unit being of U-shape with the sides of the U close together and terminating at the ends of the roll.

5. A cylindrical roll of the class described having electric heaters fixed therein extending longitudinally thereof nearer its center

line than its outer surface the roll being composed of solid metal except for the space occupied by said heaters.

6. A cylindrical roll of the class described having electric heaters therein mounted for rotation therewith and extending longitudinally thereof from its opposite ends to points near its longitudinal center, the roll being composed of solid metal except for the space occupied by said heaters.

7. A roll of the class described composed of metal and having a series of reflexed tubes of small cross section extending longitudinally therein from the end arranged symmetrically around the center line and electric heating means in and extending along said tubes.

8. A cylindrical roll of the class described composed of steel and having a central cylindrical bore, a supporting shaft having thereon a cylindrical core having a series of pairs of openings in its ends extending longitudinally of the axis the openings of each pair being closely adjacent and connected at their inner ends near the longitudinal center of the roll and continuous electric heating means in each pair of openings and construction.

9. A cylindrical roll of the class described composed of steel and having a central cylindrical bore, a supporting shaft having thereon a cylindrical core of metal tightly fitting in the bore of said steel roll and a series of electric heaters in said core extending longitudinally thereof.

10. A cylindrical roll of the class described composed of steel and having a central bore, a supporting shaft having thereon a cylindrical

core of metal tightly fitting in the bore of said steel roll and a series of electric heaters in said core extending longitudinally thereof from its ends to planes spaced apart and at equal distances from the longitudinal center.

11. A cylindrical roll of the class described composed of steel and having a central cylindrical bore, a supporting shaft having thereon a cylindrical core of metal tightly fitting in the bore of said steel roll and a series of electric heaters in said core extending longitudinally thereof from its ends in U-form the sides of the U being closely adjacent and the heating units of the series being symmetrically arranged around the center line.

12. A cylindrical roll of the class described composed of steel and having a central cylindrical bore, a supporting shaft having thereon a cylindrical core of metal tightly fitting in the bore of said steel roll the core being composed of two symmetrical sections with their inner ends abutting and each section having therein a series of electric heating units extending from the outer end longitudinally to points near the inner end.

13. A heater for cylindrical rolls of the class described comprising a metal cylinder having a central bore to receive the supporting shaft and a series of electric heating units symmetrically arranged around the bore extending from one end to a point near the other end.

In testimony whereof I hereunto affix my signature.

WILLIAM W. JOHNSON, JR.