Nov. 16, 1937. E. H. RUSS, JR 2,099,081

STRETCHING AND DRYING APPARATUS

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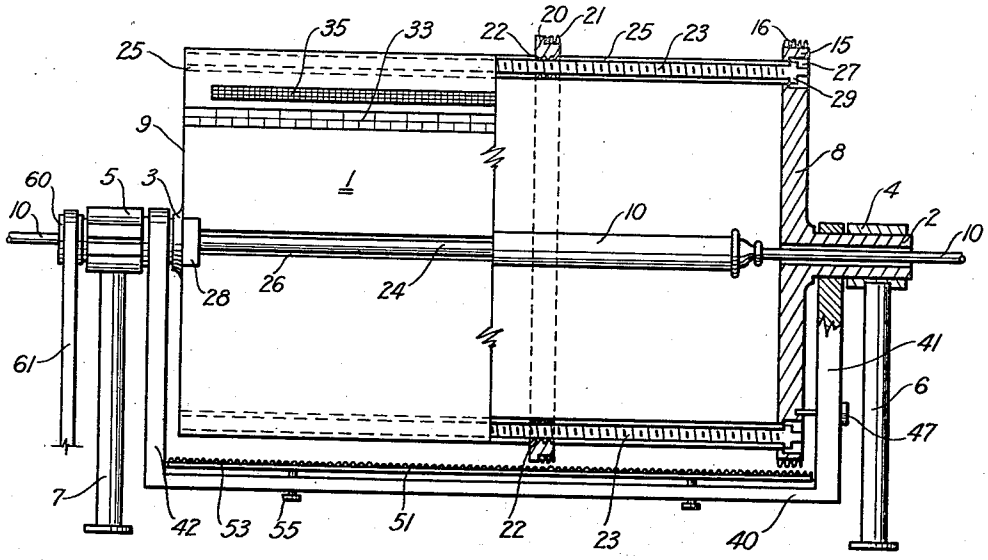


Fig. 1

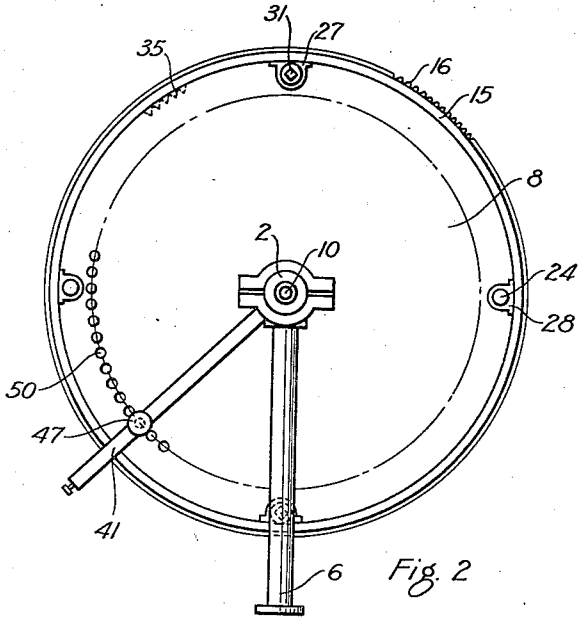


Fig. 2

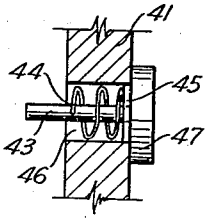


Fig. 5

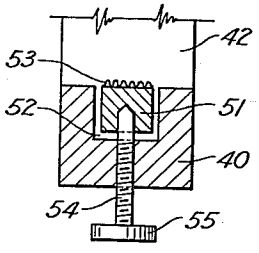


Fig. 3

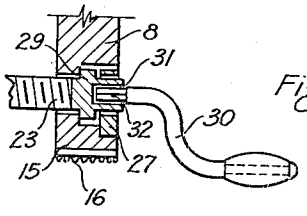


Fig. 4

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STRETCHING AND DRYING APPARATUS

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6 Claims. (Cl. 34—17)

This invention relates to the art of laundering various materials and more particularly pertains to an improved apparatus for handling such materials during the drying process. Although the improved apparatus herein disclosed is designed primarily for use in laundering such articles as curtains, blankets, rugs and the like, it will be apparent that its use may be extended to include any of the various articles subject to laundering or dry cleaning processes.

In the laundering of many types of articles it is imperative that there be no shrinkage of the material and in order to assure this result the article is customarily measured before being washed and is then stretched to the same dimensions and dried upon a stretcher after being washed. These operations are often laborious, inefficient and time consuming due to the difficulty experienced by a single operator in attempting to secure a large article on a stretcher, adjust it to a proper shape and then dry the same uniformly in that desired shape.

The present invention is directed toward the elimination of those difficulties and provides a drying apparatus having a stretching apparatus incorporated therein whereby a single operator may efficiently handle the article to be dried;

Another object is the provision of an apparatus by means of which an article may be readily stretched into a desired shape and held in that shape during a drying process;

Another object is the provision of apparatus which is compact and may be utilized with a minimum of effort on the part of the user;

A further object is the provision of an efficient drying apparatus which will assure a uniform and closely regulated drying effect and will occupy a minimum of space;

Another object is the provision of a rotatable apparatus which may be used to impose a centrifugal effect on the article being dried;

A further object is the provision of a relatively inexpensive stretching and drying apparatus requiring a minimum of manual attention;

Other objects and advantages of the invention will become apparent when considered in connection with the accompanying drawing in which,

Figure 1 is an elevation view partly in section showing the general assembly of the apparatus;

Figure 2 is an end view of Figure 1 showing the clamping means in a different position;

Figure 3 is a detail view showing one means of adjusting the clamping means;

Figure 4 is a detail view showing one means of actuating the ring member; and

Figure 5 is a detail view showing a means for holding the adjustable clamping means in position.

As shown in the drawing, a rotatable cylindrical drier 1 is constructed with hollow axle portions 2 and 3 which are journalled in bearings 4 and 5 supported upon pedestals 6 and 7. The drier is formed with end members 8 and 9 secured to the cylindrical portion 1 and carrying the axle portions of the drier. Extending longitudinally of the drier is a heating source such as a stationary steam pipe 10 which may conveniently be enlarged inside the drier to provide an increased radiating surface. Pipe 10 extends through the rotatable axle portions 2 and 3 with a close fit and may be supported in any suitable manner exteriorly of the drier, as for example by brackets (not shown) attached to pedestals 6 or 7. By virtue of this construction, the heat from pipe 10 is radiated to the surface of drier 1 and provides a uniform drying effect at any portion on the circumference of the drier.

Since widely varying types of articles may be dried upon the apparatus, the degree of heat required will necessarily be subject to variations. For this reason, it is proposed to use a conventional thermostatic control means (not shown) in steam line 10 when such use is warranted. Other conventional means such as thermometers, pressure control valves, humidistats and the like could be used in connection with the apparatus when occasion requires without departing from the scope of the invention.

Due to the construction employed, the drier has no openings from which heat can escape and an efficient use of the heat supplied by pipe 10 is thus obtained. Although the structure thus described comprises an efficient drying means, it is necessary to provide cooperating means to hold the article to be dried in place on such a drier during the drying operation. As an essential and integral part of the invention a means is provided for holding an article in place either in a stretched condition or in an unstretched condition. The invention, therefore, includes in combination with the above drier a means which may function to hold the article longitudinally or circumferentially of the drier or to hold it in both of these directions.

As shown on Figure 1, a ring member 15 is securely fixed to drier 1 adjacent end member 8 and is provided with a roughened outer surface 16 which may consist of corded wire or the like. Surface 16 is adapted to provide a frictional engagement with one edge of any material placed

in contact therewith and will hold such material against movement without tending to tear the same. Cooperating with ring 15 is a second ring member 20 adjustable longitudinally of the drier and having a roughened outer surface 21 functioning to hold another edge of material placed in contact therewith.

Movable ring 20 is provided with two interiorly disposed boss members 22 preferably located on diametrically opposite sides of the ring and threaded for engagement with two longitudinally disposed threaded rods 23. As a supporting means for relieving any binding of the ring on these threaded rods additional rods 24 are fitted into the outer surface of the drier and support the weight of the ring 20 through additional bosses (not shown) on the interior of such ring. Ring 20 is thus supported by rods 24 at all times regardless of its position along the drier and at the same time may be moved freely along rods 24 due to the engagement of its threaded bosses 22 with threaded rods 23.

Rods 23 and 24 are positioned in recesses 25 and 26 on the exterior surface of drier 1 and are secured into end members 8 and 9 by any suitable bracket means such as indicated at 27 and 28. Since the recesses are of appreciable depth, the material resting upon drier surface 1 will lie over the rods 23 and 24 without contacting the same. In order to move ring 20 it is necessary to rotate threaded rods 23 and since such rods must turn in their mountings in the end members, a collar member 29, shown in Figure 4, is provided. The bracket 27 is adapted to hold the rod in assembled position. One convenient means for turning rods 23 in order to move ring 20 may comprise a removable crank 30 adapted to be operated manually. It will be apparent, however, that any other means for turning rods 23, such as a motor driven mechanism, may be employed without departing from the scope of the invention. In employing a crank such as shown, the ends of rods 23 may be formed with a square recess 31 into which a square end 32 of crank 30 may be inserted and turned.

Movable ring 20 in cooperation with ring 15 and the drier surface 1 provides a construction for drying a material and stretching it in one direction. Since articles such as blankets, curtains and the like may shrink in drying, it is customary to measure the same prior to laundering and then to dry them to the same dimensions. In order, therefore, to assure the drying of a material held by rings 15 and 20 in its desired shape a scale 33 is incorporated into the surface of drier 1 and provides a ready means for the proper positioning of movable ring 20. Such scale preferably comprises a flat brass strip graduated in inches and welded to the drier flush with its surface. Since the drier is rotatable and ring 20 may be adjusted from either or both of rods 23, it is intended to provide a plurality of such scales at convenient places on the surface of the drier cylinder.

In order to hold an article having appreciable dimensions in two directions means is provided for securing such article circumferentially as well as longitudinally of the drier. Incorporated into the drier surface 1 is a roughened surface 35 extending substantially the entire length of the drier. As explained hereinafter, one edge of the article to be dried may be laid along surface 35 and held in frictional contact therewith. Any suitable type of surface may be used such as a corded wire, a knurling of the drier surface or similar frictional means. To hold the fourth edge of the article the adjustable clamping means 40 is provided. This clamping means comprises an elongated member held by arms 41 and 42 and pivoted about axle members 2 and 3. For securing the clamping means in proper position radially of the drier a retaining pin 43, such as shown in Figure 5, may be used. Pin 43 has attached thereto a spring 44 under tension and bearing against a back plate 45 secured in a recess 46 in arm 41. A head 47 on pin 43 may be used for moving the pin outwardly against pressure of the spring. If desired, means for locking pin 43 in its withdrawn position may be used.

In the end member 8 is a series of holes 50 forming a scale for measuring circumferential distances from surface 35 as a base. The pin 43 is adapted to fit into any selected hole 50 and to hold clamping means 40 securely in place. The row of holes 50 will preferably be graduated in inches to provide a convenient measuring means.

Clamping means 40 is pivoted on a radius larger than the radius of the external surface of drier 1 in order to retain articles of varying thickness. For securing the article in place on the drier an adjustable strip 51 is positioned in a slot 52 extending along the clamping means. Strip 51 has incorporated into its upper surface a rough surface 53 adapted to press against one edge of the article and to hold the same securely. Any suitable means for adjusting strip 51 may be provided, but for convenience a simple manually operable screw 54 having a head 55 and screwing into clamping means 40 is shown herewith. It is obvious that any number of these means for adjusting strip 51 may be used and that other equivalent means for serving the same purpose may well be used without departing from the invention.

As will be apparent, the drier 1 is freely rotatable and may be turned manually or by means of a prime mover should occasion require. In the event that the drier is used for drying an article such as a heavy rug where increased evaporation from the nap of the same is desirable and where the effect of centrifugal force is needed for throwing out the nap of the rug, a means such as shown in Figure 1 may be used. In this construction a pulley member 60 forms an extension of hollow axle portion 3 of the drier and has attached thereto a belt 61 driven by any prime mover (not shown). It is obvious, therefore, that the drier and its integral cooperating stretching mechanism may be rotated at any desired rate of speed to carry out the drying operation.

In using the above disclosed apparatus an operator may follow this procedure. After adjusting ring 20 to the desired width of the article to be dried, he would then place one of the lengthwise edges of the article along surface 35 of the drier and the two side edges of the article along surfaces 16 and 21 of rings 15 and 20. Then by slowly rotating the drier the material will be laid along the drier surface. Clamping means 40 will be adjusted for the proper length of the article by placing pin 43 in the proper hole along scale 50. If necessary, the strip 51 will be adjusted to accommodate the thickness of the article being dried since the same apparatus may be used successively for drying a thin curtain and a thick rug or blanket.

After the article has dried it is easily removed from the apparatus merely by loosening

clamping means 40 and lifting the article from the surface of the drier. Due to the fact that the drier is rotatable one operator may handle large articles which formerly required the services of two or more attendants. Merely by folding the article prior to placing it on the apparatus and slowly unfolding it as the drier is rotated one person is thus enabled to handle large articles without difficulty.

Having thus described the invention, it will be obvious that many variations in size, structure and materials may be devised to serve the same function without departing from the teaching thereof.

I claim:

1. Apparatus for drying a fabric article comprising in combination, a closed arcuate drying surface, a roughened surface incorporated into the drying surface and adapted to provide a frictional contact with the article, a centrally disposed heating source within the closed drying surface and adjustable frictional contact means cooperating with the roughened surface for holding the edges of the article to be dried substantially flush against said drying surface.

2. Apparatus for drying a fabric article comprising in combination, a closed cylindrical drier, a source of heat within the drier, a roughened surface extending longitudinally of the external surface of the drier and adapted to provide a frictional contact with one edge of the article and a longitudinally disposed, adjustable frictional contact clamping means adapted to hold another edge of the article against the surface of the drier whereby the edges of the article are held substantially flush against the drier surface at all points.

3. Apparatus for stretching and drying a fabric article comprising in combination, an arcuate drying surface having means providing a frictional engagement with the article, an arcuate member longitudinally adjustable of the drying surface and having means providing a frictional engagement with the article, clamping means for the article adjustable radially of the drying surface whereby the article may be stretched longitudinally and circumferentially by the adjustable arcuate member and clamping means in order to hold the same in a desired shape.

4. In a structure of the character described, a closed cylindrical drier adapted to exert a substantially uniform drying effect at all points on its exposed surface, frictional contact means incorporated into the drier surface for holding an article substantially flush against the drier surface along one edge and radially adjustable frictional contact means adapted to hold a parallel edge of the article substantially flush against the drier surface.

5. In a structure of the character described, a closed cylindrical drier adapted to exert a substantially uniform drying effect at all points on its exposed surface, frictional contact means incorporated into the drier surface for holding an article substantially flush against the drier surface along one edge and longitudinally adjustable frictional contact means adapted to hold a parallel edge of the article substantially flush against the drier surface.

6. In a structure of the character described, a closed cylindrical drier adapted to exert a substantially uniform drying effect at all points on its exposed surface, frictional contact means incorporated into the drier surface for holding an article substantially flush against the drier surface along a longitudinal edge, frictional contact means incorporated into the drier surface for holding an article substantially flush against the drier surface along a transverse edge, radially adjustable frictional contact means adapted to hold a second longitudinal edge of the article substantially flush against the drier surface and longitudinally adjustable frictional contact means adapted to hold a second transverse edge of the article substantially flush against the drier surface.

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