March 30, 1943. R. W. LUZIUS 2,315,124

DRYING MACHINE

Filed Sept. 3, 1942 2 Sheets-Sheet 1

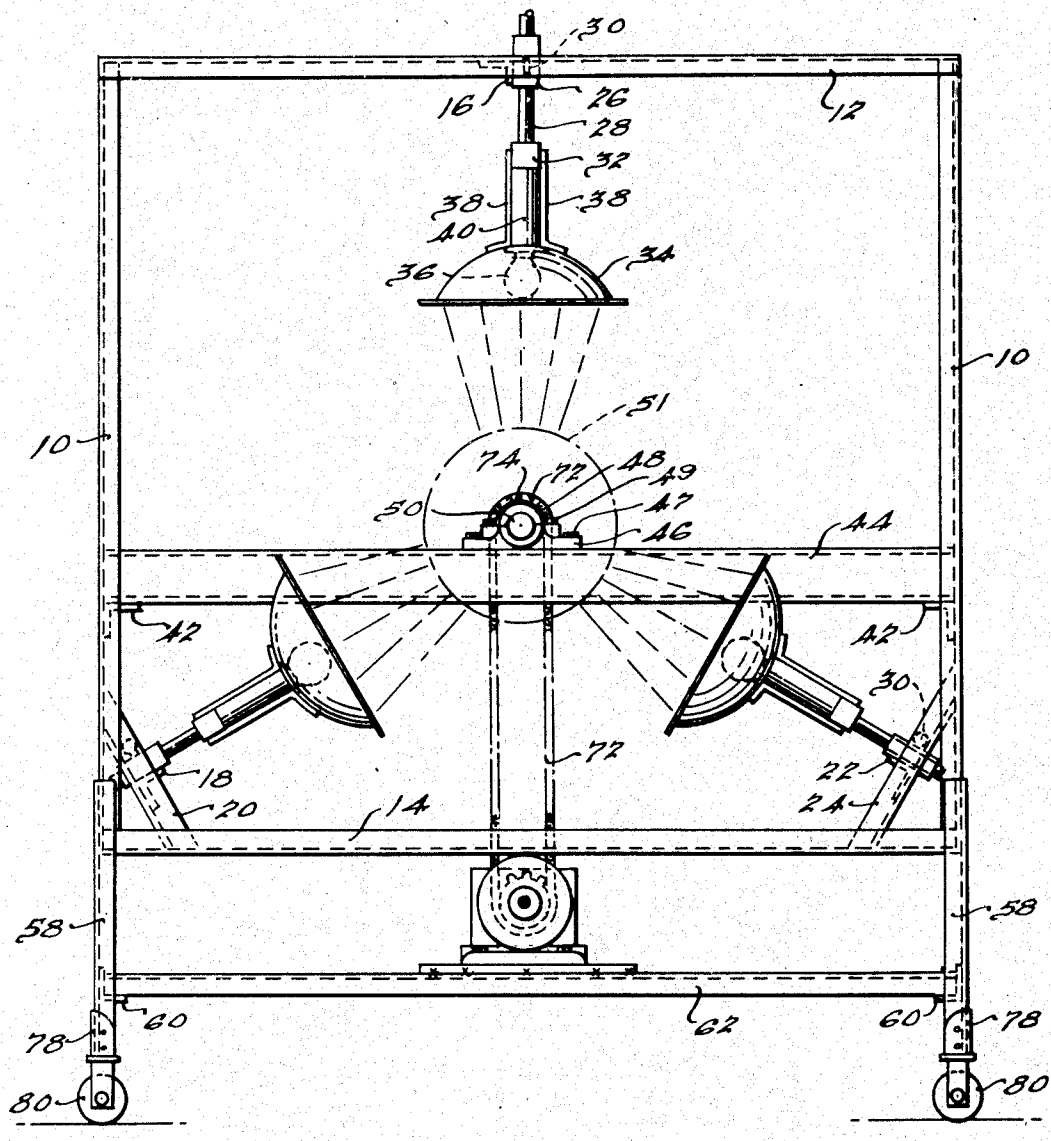


FIG. 1.

FIG. 4.

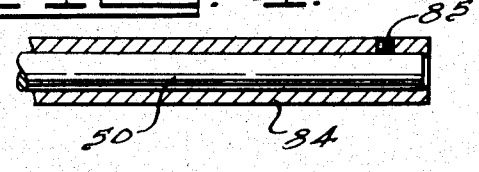
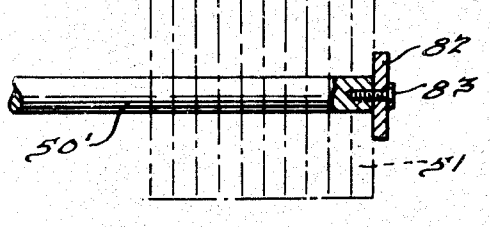


FIG. 3.



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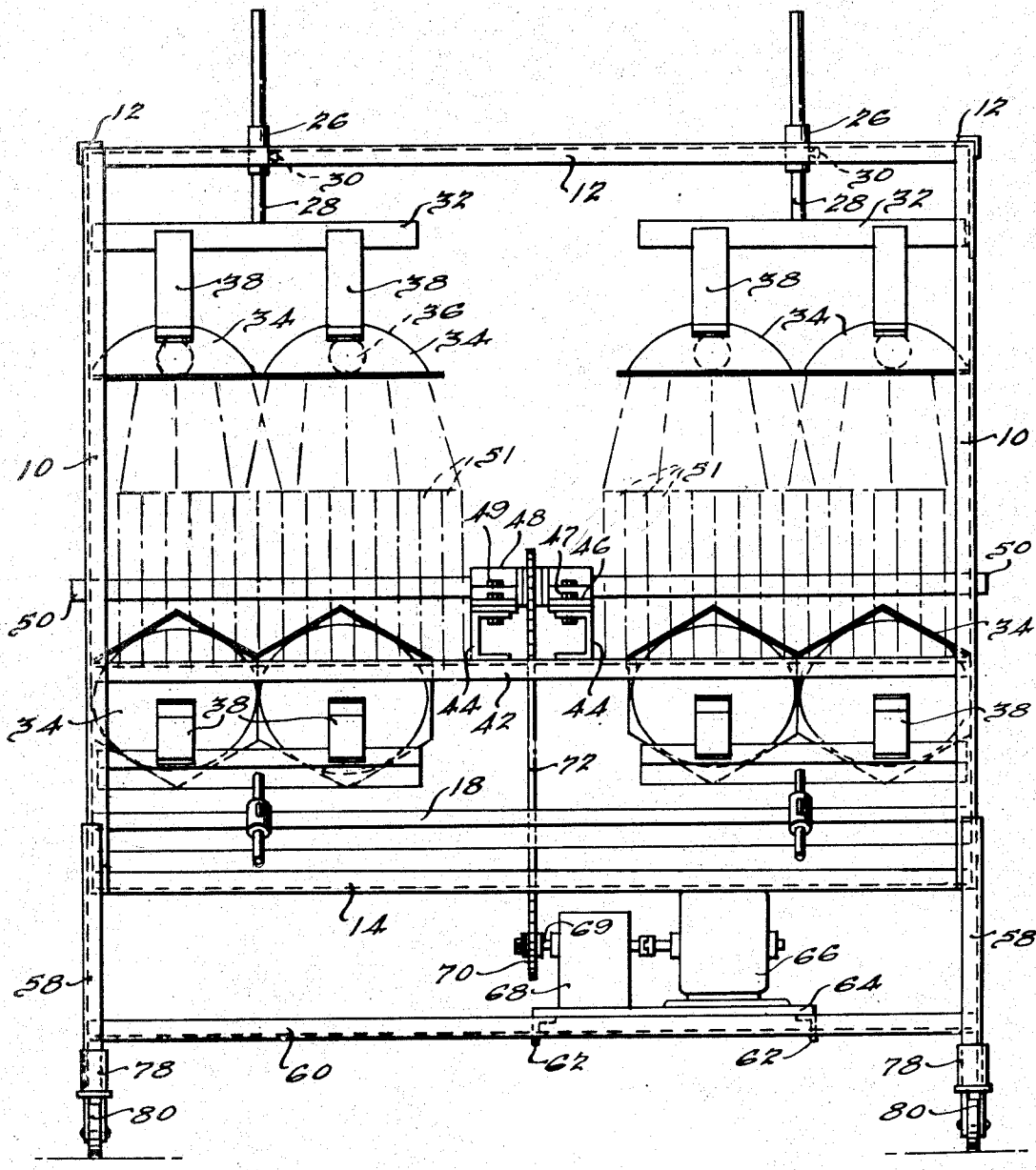

FIG. 2.

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DRYING MACHINE

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Application September 3, 1942, Serial No. 457,112

6 Claims. (Cl. 34—240)

The present invention relates to an apparatus for drying polishing wheels.

The conventional form of polishing wheel is made up in laminated form of a plurality of layers of fabric bonded together, and an abrasive compound in powdered form is secured to the periphery of the wheel by means of an adhesive. After the abrasive compound is worn off the wheel, it is necessary to coat the periphery of the wheel with adhesive and apply a new layer of abrasive compound. The particular adhesives conventionally used for this purpose are dried by means of heat, and considerable time is lost in a large stock of wheels because of the relatively long drying period before the wheels are in condition for use.

It is the general object of the present invention to provide a simple, inexpensive and portable apparatus for drying polishing wheels rapidly by the use of radiant heat energy.

It is another object of the present invention to provide an apparatus of the type mentioned which is highly efficient and employs a relatively small number of radiant heat emitting lamps which are focused upon the peripheries of the wheels.

It is another object of the invention to provide an apparatus of the type mentioned which will dry the wheels uniformly and which may be easily loaded and unloaded.

Other objects and advantages of the apparatus will become apparent from the following specification, the drawings relating thereto, and from the claims hereinafter set forth.

In the drawings, in which like numerals are used to designate like parts in the several views throughout:

Figure 1 is a front elevation of the machine;

Figure 2 is a side elevation of the machine;

Figure 3 is a fragmentary view of a modified form of the wheel supporting shaft of the machine; and

Figure 4 is a view of an auxiliary sleeve which may be employed in connection with the wheel supporting shaft of the machine, if desired.

Referring to the drawings, the machine is made up of a relatively simple angle iron framework comprising four upright corner posts 10 connected at their tops by four horizontal members 12 and at their bottoms by four horizontal members 14. Extending across the top of the machine in a fore-and-aft direction between the mid points of two opposite angle members 12 is an angle iron 16 which, in a manner hereinafter described, is adapted to support one bank of radiant heat emitting lamps. At the lower left-hand corner of the machine, as viewed in Figure 1, is a similar angle iron 18 secured at its ends to a pair of angle members 20 which extends diagonally between uprights 10 and the lower horizontal members 14. The position of the members 20 is such that the upper flange of the angle iron 18 extends at an angle of approximately thirty degrees (30°) to the horizontal.

At the lower right-hand side of the machine, as viewed in Figure 1, an angle iron 22, similar to the angle iron 18, is supported in like manner on a pair of angle iron members 24.

Each of the angle irons 16, 18 and 22 supports two banks of heat radiating lamps. Since the arrangement of the banks on each angle iron is identical, a description of the banks supported by angle iron 16 will suffice for all. A pair of sleeves 26 is welded in position on the angle iron 16 in spaced relation, as best shown in Figure 2. Each of the sleeves 26 receives a rod 28 which may be adjusted axially within the sleeve and held in any desired adjusted position by means of a thumb set screw 30 or any other suitable means. Each of the rods 28 is fixed to a hollow sheet metal supporting bar 32 intermediate the ends of the bar.

In the particular embodiment shown, each supporting bar 32 carries a pair of heat radiating elements or lamps comprising reflectors 34 and lamp bulbs 36. Each reflector is secured to its bar 32 by a pair of arms 38 which is welded at one end to the bar 32 and at the other to the back of the reflector 34 and which embraces a tubular lamp supporting element 40. The two reflectors 34 secured to each bar 32 are preferably octagonal in shape, as best shown in Figure 2, so that they will fit against each other. The wiring for the lamps is not shown, but may extend in any suitable manner through tubular members 40, supporting elements 32, and thence to a source of electric energy.

As a result of the above construction, there is provided at each end of the machine three banks of lamps spaced at one hundred and twenty degrees (120°) from each other and directed toward a central axis.

A pair of parallel angle irons 42 extend between the vertical angle irons 10 and support a pair of transversely extending channels 44 which are located between the two groups of lamps, as best shown in Figure 2. Each of the channel members 44 supports a bearing comprising a lower bearing member 46 secured by bolts 47 to the angle iron 44 and an upper bearing member 48

secured by cap screws 48 to the lower bearing member. The two bearings support and journal a longitudinally and centrally located shaft 50 which projects outwardly from the two bearings in opposite directions. The projecting ends of the shaft 50 are entirely free and unsupported.

The shaft 50 is adapted to receive a plurality of polishing wheels indicated in dotted lines at 51, which wheels are simply slipped over the free ends of the shaft 50 in a direction toward the central bearing.

The apparatus is provided with an undercarriage formed of four upright members 58 welded at their upper ends to the bottom of the angle irons 18. A pair of parallel angle irons 60 extends between the uprights 58 and supports a pair of transverse angle irons 62 which extends between and is supported upon the angle irons 60. A steel plate 64, which is welded or otherwise suitably secured to the upper surfaces of the angle iron 62, in turn supports an electric motor 66 and a gear reduction box 68 of any suitable construction. The driven shaft 69, which projects from the gear box 68, carries a sprocket 70 which drives through chain 72 a sprocket 74 on the wheel supporting shaft 50. The construction and arrangement of the motor, gear box and the sprocket chain are preferably such as to drive the wheel supporting shaft 50 at a speed in the order of twelve to twenty R. P. M., but it is obvious that this shaft may be rotated at higher or lower speeds, if desired.

The lower ends of the uprights 58 of the undercarriage are provided with caster supporting brackets 78 which carry caster wheels 80 to facilitate transportation of the unit.

It will be observed that the machine provides two projecting ends of the shaft 50 upon which any desired number of polishing wheels may be placed by simply inserting the shaft end through the central openings in the wheels. The diameter of the shaft 50 is preferably so selected as to loosely receive wheels having the smallest size openings. Consequently, a relatively wide range of wheel sizes may be accommodated by the machine without any change or alteration in the structure. The weight of the wheels produces enough friction against the top of the shaft 50 to cause the wheels to rotate slowly when the shaft is rotated.

It will be observed that the heat radiating lamps are arranged in two groups, one for each shaft end, and that each group comprises three banks of two lamps each, the banks being spaced about the peripheries of the wheels at angles of one hundred and twenty degrees (120°) from each other. The shape of the reflectors is preferably such that, as shown in Figure 1, the heat radiated from each lamp will be concentrated on a relatively small area on the peripheries of the wheels. To accomplish the desired concentration, the lamps may be focused by adjusting the rods 28 in their supporting sleeves 30. This adjustment makes it possible to use the machine for wheels of different diameters. The reflectors 34 are also preferably so constructed that they suitably diffuse the reflected radiant heat over the full length of the projecting ends of the shaft 50, as best shown in Figure 2, thus distributing the heat uniformly along the shaft but concentrating it on a relatively small area of the wheel periphery measured circumferentially. This arrangement of the lamps makes the most efficient use of the radiant heat since practically all of the heat impinges upon the peripheries of the wheels in a substantially radial direction.

The slow rotation of the shaft 50 evenly distributes the effect of the concentrated heat waves around the peripheries of the wheels and thus produces a uniform drying rate and eliminates all possible effects of any unintentional variation in the amount of heat produced by each bank of lamps.

In actual practice it is found that there is little or no tendency of the wheels to work off the free ends of the shaft 50 and, therefore, it is preferred to avoid the use of any retaining means on the end of the shaft. This facilitates the placing of wheels on the shaft and their removal. However, if in certain cases the wheels have a tendency to work off the end of the shaft, this may be readily avoided in the manner shown in Figure 3 by securing a retaining plate 82 to the end of the shaft 50' by means of a cap screw 83.

Where the machine is to be used on wheels of a wide range of sizes wherein the central openings are consequently likewise of a wide range in diameter, it may be desirable to employ an auxiliary sleeve 84, as best shown in Figure 4, to accommodate the larger size wheels and reduce clearance between the wheel openings and the shaft. The sleeve 84 may be secured to the shaft 50 in any desired manner, as by set screw 85. It will be understood, of course, that the retaining plate 82 may also be employed in conjunction with the sleeve 84, in which event the retaining plate will also retain the sleeve in position.

It is apparent that there is provided in accordance with the present invention a simple, inexpensive apparatus which will effectively dry the peripheries of polishing wheels rapidly and uniformly. One of the important features of the machine is the fact that the rotation of the wheels not only insures uniform drying, but also makes possible the employment of a relatively few number of lamps the individual effect of each of which is concentrated on a relatively small area.

While only one form of the invention is shown and described, it is apparent that variations in the construction may be made without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. An apparatus for drying the peripheries of polishing wheels and the like having an axial opening including a rotatable shaft upon which a wheel may be mounted with the shaft passing through the wheel opening, means located in radially spaced relation to the shaft for directing and focusing radiant heat toward the shaft and on the periphery of the wheel to dry the same, and means for rotating the shaft to present all portions of the periphery of the wheel to the direct action of the radiant heat.

2. An apparatus for drying the peripheries of polishing wheels and the like having an axial opening including a rotatable shaft upon which a wheel may be mounted with the shaft passing through the wheel opening, means located in radially spaced relation to the shaft for directing and focusing radiant heat toward the shaft and on the periphery of the wheel at a plurality of circumferentially spaced points about the wheel to dry the same, and means for rotating the shaft to present all portions of the periphery of the wheel to the direct action of the radiant heat.

3. An apparatus for drying the peripheries of polishing wheels and the like having an axial opening including a frame, a shaft journaled in said frame with an unsupported end adapted to receive a polishing wheel with the shaft passing through the wheel opening, means on the frame located in radially spaced relation to the shaft for directing and focusing radiant heat toward the shaft and on the periphery of the wheel to dry the same, and means for rotating the shart to present all portions of the periphery of the wheel to the direct action of the radiant heat.

4. An apparatus for drying the peripheries of polishing wheels and the like having an axial opening including a frame, a shaft journaled in said frame with an unsupported end adapted to receive a polishing wheel with the shaft passing through the wheel opening, means on the frame located in radially spaced relation to the shaft for directing and focusing radiant heat toward the shaft and on the periphery of the wheel at a plurality of circumferentially spaced points about the wheel to dry the same, and means for rotating the shaft to present all portions of the periphery of the wheel to the direct action of the radiant heat.

5. An apparatus for drying the peripheries of polishing wheels and the like having an axial opening including a frame, a shaft journaled intermediate its ends on said frame and having its oppositely projecting ends unsupported, each of said shaft ends being adapted to receive a polishing wheel with the ends of the shaft projecting through the wheel openings, means on the frame located in radially spaced relation to the two ends of the shaft for directing and focusing radiant heat toward the shaft and on the peripheries of the wheels to dry the same, and means for rotating the shaft to present all portions of the peripheries of the wheels to the direct action of the radiant heat.

6. An apparatus for drying the peripheries of polishing wheels and the like having central openings including a frame, a shaft journaled at its center on the frame and projecting freely in opposite directions, the free ends of the shaft being adapted to receive polishing wheels with the shaft ends projecting through wheel openings, axially spaced banks of infrared lamps on the frame located in radially spaced relation to the ends of the shaft respectively, means associated with the lamps for focusing the radiant energy from said lamps on the peripheries of the polishing wheels, and a motor operatively connected to said shaft intermediate its ends for rotating the shaft and thereby said wheels to present all portions of the peripheries of the wheels to the action of said infrared radiant energy.

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