HEAT TREATING ARCH FOR TREATING FINISHES ON VEHICLES AND THE LIKE

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This invention relates generally to baking ovens and more particularly to a novel adjustable heat treating arch for automotive shops, for example, but having other practical applications as will be apparent to those skilled in the art.

Dry-drying facilities in most body shops or in other establishments have been constructed with fixed dimensions, and thus the treating of finishes on different sized vehicles, in view of the wide range of dimensions, is an existing problem. Since heat rises, when a standard sized bake oven is used to dry the finish of a relatively small vehicle, a large amount of the most efficient heat is lost in the unnecessary space above the vehicle. As a general rule, most body shops or the like cannot afford the luxury of a plurality of different sized bake ovens and thus a primary object of this invention is to provide a versatile and practical heat treating arch.

A further object of the invention is to provide a relatively inexpensive and practical heat treating arch which includes an adjustable portion for aiding in concentrating heat in the most efficient manner for treating different sized articles, especially vehicles.

Another object of the invention is to provide means whereby the top of a heat treating arch may be vertically adjusted relative to heat emitting means in side members.

Still another object of the invention is to provide a heat treating arch including means whereby power means for an adjustable top member is de-energized in order to prevent damage to the force transmitting means incorporated therein.

Other objects and the nature and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

In the drawings:
FIGURE 1 is a perspective view of the novel heat treating arch, showing the vertically adjustable top member in its lowermost adjustable position, with portions broken away for purposes of clarity;
FIGURE 2 is a vertical section taken substantially on line 2—2 of FIGURE 1, illustrating an exemplary form of power means for the vertically adjustable top member;
FIGURE 3 is an enlarged fragmentary section on line 3—3 of FIGURE 2 showing a detail of how a suspension cable is entrained over a support pulley on one of the side members of the novel arch;
FIGURE 4 is a fragmentary underside plan view of a portion of the underside of the top member taken from the plane of line 4—4 of FIGURE 1; and
FIGURE 5 is an enlarged fragmentary section taken on line 5—5 of FIGURE 1, showing a cable entrained over a pulley mounted on one of the side members of the heat treating arch.

Referring to the drawings in detail, the novel heat treating arch is indicated generally at 10 and includes spaced parallel side members indicated generally at 12 and 14 and a top member 16 which is suspended therefrom in a manner to be described in detail. The top member 16 will be vertically adjusted relative to the side members through the medium of power means indicated generally at 18. The heating means, which may comprise banks of infra-red lamps on the confronting inner surfaces of the side and top members together with the power means will be conveniently controlled by a control panel indicated generally at 20, which will subsequently be described in detail.

The side members 13 and 14 are substantially the same and are of a hollow box-like construction and are constructed from any suitable material and are of any satisfactory construction, being shown in the exemplary embodiment as comprising plates and reinforcing angle members. In order to stabilize the side members suitably and reinforcing bars 22 are provided at the top and sides of the side members.

Included within the side member 12 is a support platform 24 upon which is mounted a power source 26 comprising a suitably rated, reversible electric motor. The motor 26 includes a drive shaft 28 including a driving sheave 30 over which is entrained a flexible drive belt 32 extending over driven sheave 33 on the input shaft 34 of a suitable transmission 36. The transmission 36 includes a power output shaft 38 having a toothed wheel 40 thereon over which is entrained an endless drive chain 42.

A shaft 44 is journaled at opposite ends in suitable bearings 46 mounted on opposed end walls of the side member 12. The shaft 44 has a toothed wheel 48 secured intermittently thereof which is engaged by the drive chain 42. Thus the shaft 44 may be rotated for the purpose of coiling or uncoiling suspension cables and will in effect comprise a reel for these cables.

The shaft 44 has fixed thereon spaced disc elements 50 between which is secured the end of a suspension cable as indicated at 52, 54, 56 and 58. Depending from the upper surface of the side member 12 are support pulley assemblies 60, one of each receiving one of the suspension cables therethrough. The inner wall 62 of the support member 12 includes a plurality of apertures 64 each accommodating one of the suspension cables therethrough.

Secured on the outer surface of wall 62 are pulley assemblies 66 and 68 which respectively receive the cables 52 and 58. The cables 52, 58 are terminally secured to suitable vertically disposed eye elements 70 secured at underlying corners on the upper surface of the top member 16. The cables 54, 56 extend to the side member 14 and are respectively received in pulley assemblies 72, 74 secured on the inner wall 76 of the side member 14. The cables 54, 56 are terminally secured to underlying eye elements 70 at the other corners of the top member.

It will now be understood that as the motor 26 is operated, the shaft 44 will be rotated in one direction or the other to accordingly “reel in” or “unreel” the suspension cables 52—58 to according raise or lower the top member 16.

As the top member is raised or lowered, the opposite side edges 78, 80 will traverse the three horizontal rows of infra-red lamps 82 mounted on an upper panel portion of the side members and which are suitably mounted in the side walls 62 and 76. Any desired number of rows of lamps may be used. The inner wall 84 of the top member 16, see FIGURE 4, also includes infra-red lamps 86. The inner walls 62, 76 of the side members include an intermediate horizontally directed panel portion 88 and lower angularly related panel portion 90. The panel portions 88, 90 include rows of infra-red lamps 92 thereon and by virtue of the angular disposition of these panels the heat emanating from the lamps 92 is substantially concentrated on the article being treated.

Mounted on the inner walls 62, 76 of the side members 12, 14 are horizontally disposed abutment bars 94 which will limit the downward movement of the top member 16.
Mounted on the inner wall 62, if preferred, in the path of travel of the top member 16, are micro-switch assemblies 96 which are connected in series in the reversible field circuits of the motor 26. The switch assemblies 96 will function to open the field circuits due to engagement of their operating levers 98, when engaged by the top member 16 at its uppermost or lowermost position to prevent over-travel thereof and damage to the operating parts.

The side edges 78, 80 of the top member 16, when moving below a row of the infra-red lamps 82 will in a sense "blank" them out, and these "blanked" out rows of lamps will not be energized to thus afford economies of current consumption while at the same time concentrating the heat from the lamps closer to the article being treated.

The control panel 20 will include circuit breakers 100, 102, 104, circuit breakers 100, 102 being respectively connected in a circuit to the infra-red lamps 92 on the side members 12 and 14 and circuit breaker 104 being connected to a circuit to the lamps 86 on the top member 16. A control switch assembly 106 is connected in a circuit to the reversible motor 26 (which includes therein a standard fuse box assembly 108) permitting selective raising or lowering of the top member.

Included in the circuits to the lamps 92 of the side members are circuit control switches 110, 112, connected to the individual bank of infra-red lamps 92 and 82 whereby an operator may progressively energize the vertically disposed rows of lamps to accordingly utilize only those required with the part of the heat treating arch required for a particular job. The specific wiring of the electrical circuits will be conventional and accordingly further details in this regard are not believed to be necessary.

It is believed that the manner in which the novel heat treating arch is used is apparent from the foregoing. Briefly, the top member 16 is adjusted to the desired height of the vehicle being treated. The safety switch assemblies 96 will prevent excessive adjustment and subsequent damage to the mechanism. The proper infra-red lamps are energized. The hollow members 12, 14 and 16 will aid to insulate the heating and loss of heat and since the heating arch is adjusted to the size of the article being treated, efficient heat treatment will be afforded with the use of only necessary current.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is limited not to only what is shown in the drawings and described in the specification but only as indicated in the appended claims.

I claim:

1. A heat-treating arch for drying finishes on vehicles or the like comprising a pair of spaced vertical side members, a top member extending transversely of said side members, heat emitting means on the confronting inner surfaces of said members for defining a heat treating area, said top member being vertically adjustably mounted relative to said side members for controlling the height of the heat treating area in relation to an article being treated in order to attain maximum efficiency from the emitted heat, said members being of a hollow construction to aid in maintaining the heat in said area, and power means connected between said top and at least one of said side members for mechanically adjusting the vertical height of said top member, said heat emitting means on said side members including a plurality of vertically spaced rows of heat emitting elements, said rows of heat emitting elements being vertically traversable by opposite side edges of said top member, the vertically adjusted position of said top member determining which heat elements disposed therebelow will emit heat to said heat treating area, said power means comprising a reversible motor mounted in one of said hollow side members, a reel shaft journaled on said one side member, means operatively connecting said shaft to said motor for rotation thereby, suspension cables secured at one end to said shaft for reeling and unreeling in response to shaft rotation, pulley means on confronting inner surfaces of said side members over which said suspension cables are entrained, said top member being secured to said suspension cables and being suspended thereby.

2. The structure of claim 1; one of said side members including limit switches defining limits of the path of travel of said top member, said motor being electrically energized, a control circuit for said motor, said limit switches being connected in the control circuit of said motor to automatically de-energize said motor at the upper and lower limits of travel of said top member.

References Cited in the file of this patent

UNITED STATES PATENTS

2,688,068 Marr  Aug. 31, 1954
2,756,319 Hatch  July 24, 1956
2,761,948 Todd  Sept. 4, 1956
2,841,684 Miskella  July 1, 1958