

May 21, 1963

S. C. SMITH

3,090,130

LUMBER DRYING APPARATUS

Filed June 30, 1959

4 Sheets-Sheet 3

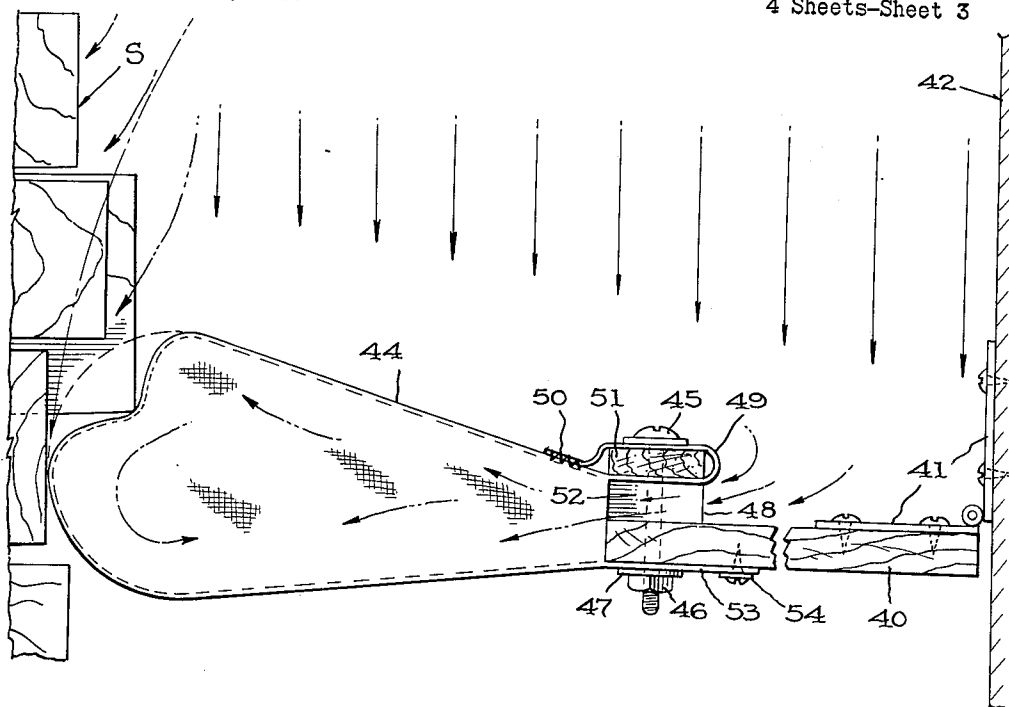
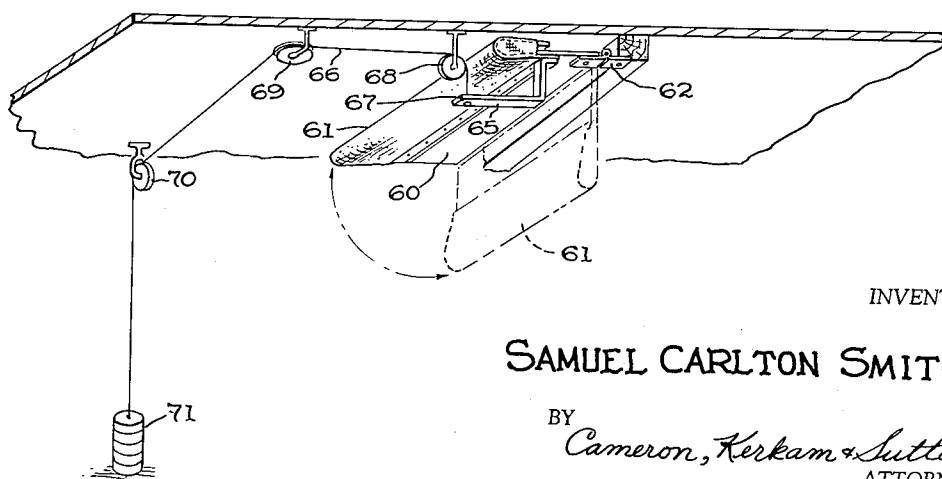


FIG. 4.

FIG. 5.



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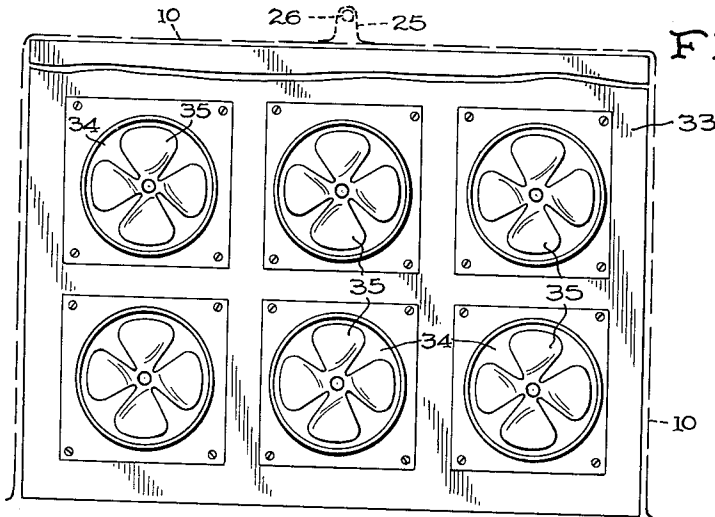


FIG. 6.

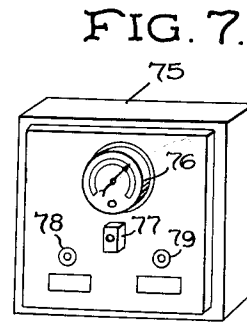


FIG. 7.

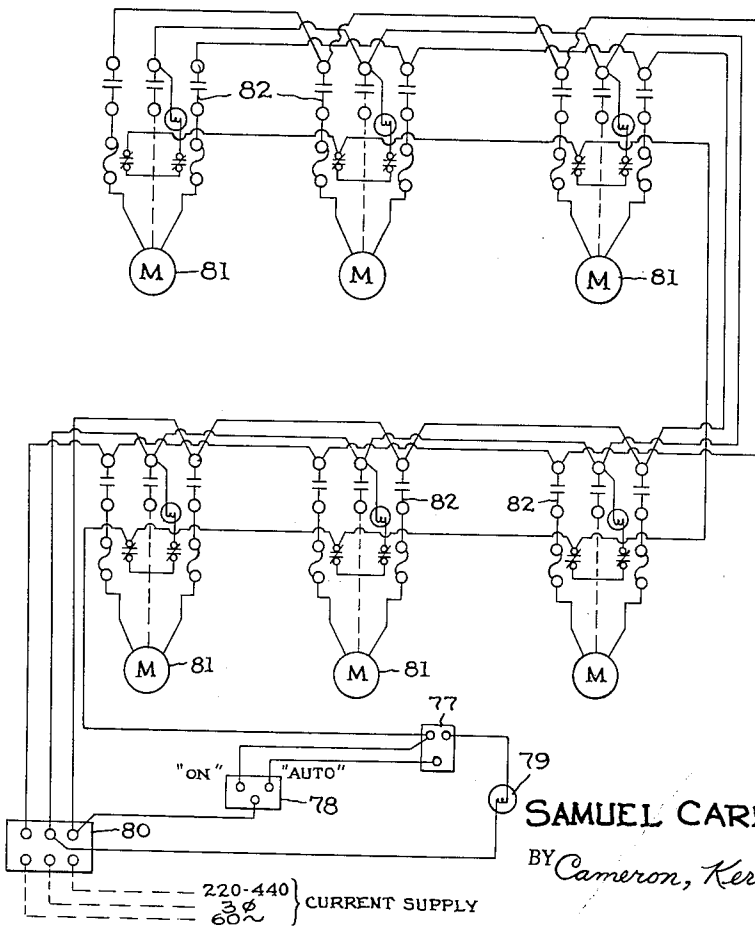


FIG. 8.

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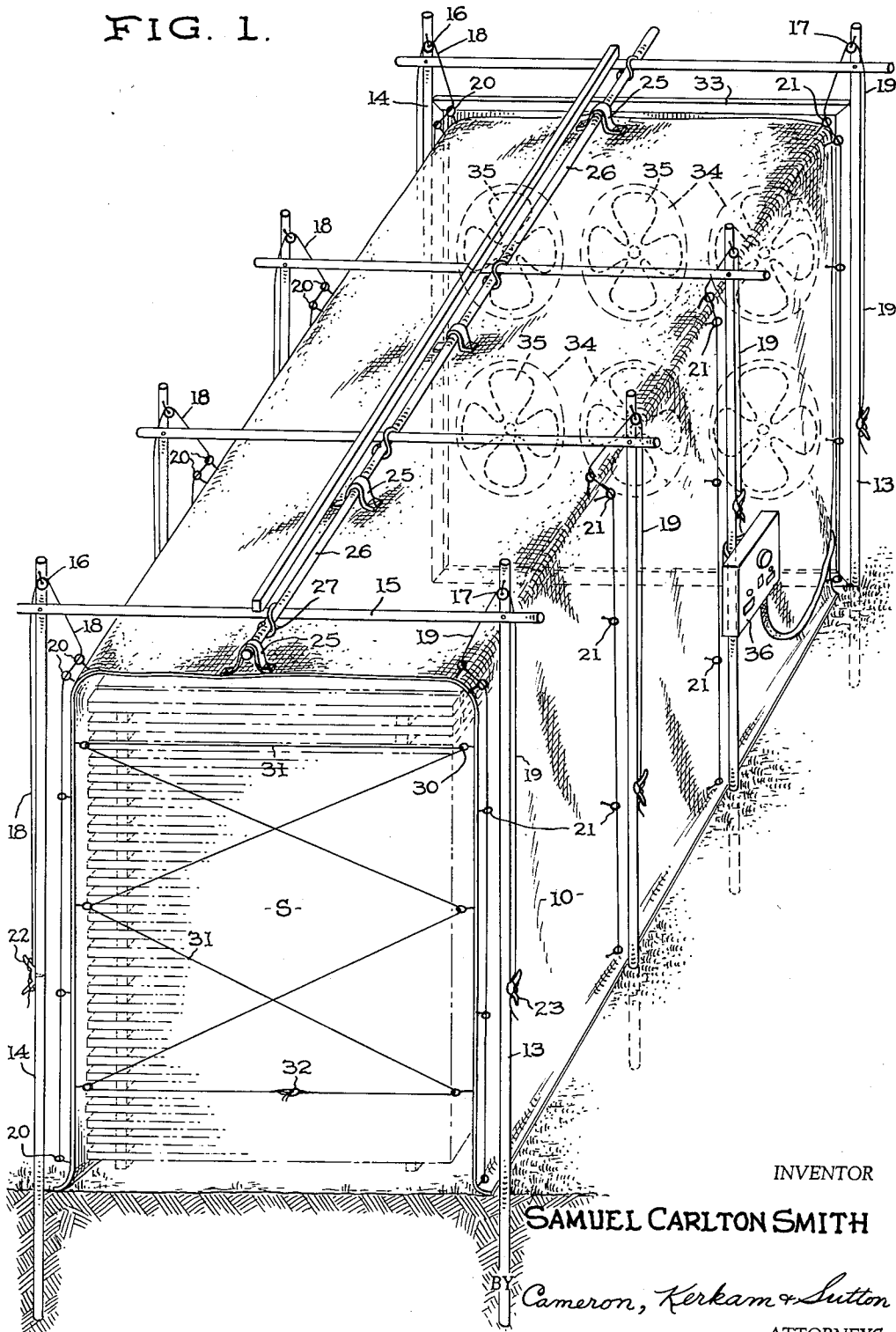
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LUMBER DRYING APPARATUS

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4 Sheets-Sheet 1

FIG. 1.



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LUMBER DRYING APPARATUS

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FIG. 2.

FIG. 3.

FIG. 9.

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LUMBER DRYING APPARATUS

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Filed June 30, 1959, Ser. No. 823,892

1 Claim. (Cl. 34—50)

This invention relates to an improved apparatus and method for initially drying green lumber, both hard and soft wood, after sawing, to prepare it for subsequent final drying in a kiln.

Lumber green from the saw is in its natural state and is free from stresses. At this point its moisture content is too high for most uses. It is a primary object of this invention to provide a first stage of drying in which the moisture content of all the boards in a stockpile is lowered uniformly to prevent warp, twist, end checks and stains and to thus provide a product in optimum condition for the final kiln drying.

For many years the lumber industry has made a practice of stockpiling green lumber, after sawing, in open yards to initially dry it and prepare the lumber for final drying. This drying period is normally from three to four months in the lumberyard and has many limitations and drawbacks. A prime objection to this method of drying lumber is the time required to dry it down to the desired moisture content. Further, due to exposure, heat and uneven drying warpage, twisting, checks and stains result, all of which degrade the lumber, decrease its ultimate value and cause a high percent of loss. The investment necessary in lumberyard area, tie up of operating capital and deterioration of lumber in the yard are all factors against this conventional method of drying.

It is therefore a primary object of this invention to evolve an apparatus and drying method which will eliminate all of the foregoing drawbacks and which will accomplish optimum preliminary drying of freshly sawed green lumber in a small fraction of the time previously required.

It is a further object of the invention to evolve a system of fast, efficient and controlled drying of green lumber which will produce a product of much higher quality than was previously possible and will do so in a predictable and greatly reduced period of time.

The system broadly comprises the shielding of the stockpile of lumber in comparatively small enclosures by means of a flexible and conformable fireproof cover and the controlled drawing of atmospheric air at desired humidity and at a constant velocity through the stockpile of lumber by means of a bank of fans, to expedite the drying operation. The fans are preferably electrically operated by individual electric motors through a controlled circuit which is responsive to the humidity of the atmospheric air, whereby fan operation is stopped whenever the humidity of the air is either too high or too low for optimum results.

As shown in the drawings, the outer end of the cover or enclosure for the stockpile of lumber is open to the atmosphere and the inner end thereof is enclosed by a wall or panel, providing a housing for the fans which draw the atmospheric air through the stockpile at a constant velocity and exhaust it thereafter to the atmosphere.

An appropriate control box is provided adjacent the housing or cover to control the operation of the fans, as will hereinafter be discussed at more length.

In another embodiment of the invention, where the apparatus is installed within a conventional building or walled shed the shroud or cover may be eliminated and appropriate swinging baffles, vertically disposed along the walls and ceiling thereof may be substituted for the shroud,

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as will hereinafter be discussed at more length. In this embodiment of the invention the outer extremity of the shed or housing is left open to the atmosphere and the inner, opposite extremity is enclosed, providing a housing for the bank of air fans which pull atmospheric air through the open end of the shed, through the stockpile of lumber and then exhaust it through the rear wall to the atmosphere. In this embodiment of the invention, also, an appropriate control box is provided, including humidostats to control the operation of the fan bank in accordance with the humidity of the atmosphere.

In most instances, and dependent upon atmospheric conditions, lumber processed by the present method is ready for kilning in from five to ten days, dried to the accepted standards of the lumber industry.

In this installation atmospheric air is drawn through the stockpile of lumber only at such times as its humidity is such that a potential for removing moisture from the lumber exists. Normally, the humidostat controlling the fans is set to stop the fans when the relative humidity of the air reaches approximately 95 R.H. and to start them when the humidity of the outside air falls below 95 R.H.

The flexible covering provides a highly efficient and low cost means of channeling the air directly through the layers of lumber and as it is flexible it may be drawn to enclose the outer contour of the stockpile closely to insure uniform movement of air over all lumber surfaces. Further, the flexible covering protects the stockpile from rain and from the direct rays of the sun and thus eliminates unequal drying conditions in the stockpile. It thus greatly accelerates uniform drying of all the lumber, regardless of its position in the stockpile, and this rapid and uniform drying eliminates twisting, warping, checks and stains in the lumber. The ultimate product of this novel drying installation is uniformly dried and of much higher quality, with practically no spoilage, than lumber which is conventionally stockpiled in yards where it is exposed to all types of weather conditions and wide variations in atmospheric humidity and temperature.

Referring to the drawings, FIG. 1 is a perspective view, partially in phantom, of one embodiment of the invention utilizing a flexible, fireproof cover, showing the bank of fans in the rear wall of the structure and the control box and circuit therefor; FIG. 2 is a perspective view, partially in phantom, of an alternative embodiment of the invention incorporating hinged, air foil baffles in a substantially rectangular building structure, including side and rear walls and a roof; FIG. 3 is a perspective view, partially broken away and in phantom of the roof section of the embodiment of the invention shown in FIG. 2; FIG. 4 is a cross-sectional view from above, taken on line 4—4 of FIG. 2, of one of the air foil baffles of FIG. 2, showing the manner of air ingress and the conforming of the inflated canvas extremity thereof to the contour of the stockpile; FIG. 5 is a partial detailed view of one embodiment of a mechanical control means for maintaining the ceiling air foil baffles in inoperative position; FIG. 6 is an end view of the fan bank extremity of the embodiment shown in FIG. 1; FIG. 7 is a perspective view of the control box structure for the fan circuit; FIG. 8 is a schematic view of the fan motor circuit and controls therefor and FIG. 9 is a simplified view of the fan motor control circuit.

Referring to the drawings, FIG. 1, S indicates a stockpile of lumber which is preferably arranged in a substantially rectangular form, the individual layers of boards being appropriately separated by spacers, as is conventional, to provide air space between the individual layers of boards. Outer cover or canopy 10, preferably formed of heavy fire proof canvas or analogous material, is shown closely fitted and extending downwardly over stockpile S

to closely engage the outer edges thereof. Canopy 10 is supported in position over stockpile S by means of an outer frame 11 composed of vertical side poles connected by lateral cross members at their upper extremities and fixed at intervals to the outer surfaces of cover 10. As shown, outer frame 11 is preferably composed of some four identical sets of vertically disposed poles 13 and 14 set in the ground at their lower extremities and joined at their tops by cross braces 15 fixed between the upper extremities of poles 13 and 14 and extending across the upper surface of cover 10. A longitudinal ridgepole, as shown, preferably joins the sets of frames at the centers of cross braces 15, to which it is appropriately nailed, or otherwise affixed.

Attached adjacent the upper extremities of vertical poles 13 and 14 are pulleys 16 and 17 over which are respectively passed supporting lines 18 and 19 which are utilized to raise and lower cover 10 and to insure a close fit thereof over the stockpile S. A series of eyelets or rings 20 and 21 are appropriately stitched or otherwise affixed at intervals to cover 10 and extend from the upper lateral edges, respectively, at both sides of cover 10 downwardly to its lower or bottom edge, lines 18 and 19 being passed therethrough and affixed to the lowest eyelets at the bottom edge of cover 10. As shown, rings 20 and 21 are arranged at equal intervals the length of cover 10, four sets thereof being preferably utilized. The outer ends of lines 18 and 19 are preferably affixed about appropriate keepers 22 and 23 provided on vertical poles 14 and 13, respectively.

The center or ridgepole section of cover 10 is appropriately supported beneath the ridgepole and cross bar 15 of frame 11 by means of a series of canvas loops 25 provided at equal intervals down its upper, median line receiving a pipe member 26 which is passed longitudinally therethrough. Pipe 26 is preferably formed of a section of pipe and is preferably supported adjacent the middle of cross braces 15 by means of a series of S-hooks 27, fitted at their upper extremities over cross braces 15 and at their lower extremities about pole 26 to support cover 10 along its upper, median line beneath the ridgepole of the frame 11. If desired, pole 26 may be bolted or lashed beneath cross braces 15.

The forward, open extremity of cover 10 is provided about its edges with a series of rings 30, preferably three to each side, as shown, which are appropriately stitched or otherwise affixed thereto and through which is passed a binding or retaining line 31 designed to hold the forward, lateral edges of cover 10 closely about the stack S, at its forward extremity. Binding line 31 is provided at its extremities with a snap and ring closure means 32 whereby its two free ends are joined after being laced through rings 30 over the outer face of stockpile S. As will be seen, removal of binding line 31 from rings 30 frees the open extremity of cover 10 to permit cover 10 to be drawn upwardly clear of the stockpile S by means of supporting lines 18 and 19, as will hereinafter be discussed at more length.

At its rear extremity frame 11 for cover 10 is provided with a fixed vertical panel 33, which may be formed of wood, plywood or metal and which is supported between the rearmost vertical poles 13 and 14 and appropriately braced therebetween. If the installation is set up within a shed or other roofed structure the rear wall of the structure may be utilized in place of panel 33.

As will be seen from FIG. 1, rear panel 33 is preferably provided with a series of six circular vents 34, aligned in two equal and parallel banks of three, in which are mounted air fans 35 and their motors to draw air through the stockpile S from the open, outer extremity of canopy 10.

Control box 36 is provided on one of the vertical supports 13 for canopy 10 and is so placed as to be freely accessible from the outside to control the operation of fans 35 in conformity with the atmospheric humidity and other factors. Control box 36 and the control circuit to

the fan motors are shown, respectively, in FIGS. 7 and 8 of the drawings and will be described in detail further on in this specification. Control box 36 houses a humidity indicator, the control humidostat or humidostats, the control switch and the pilot light for the fan circuit, as will be discussed at greater length further on in this specification.

Fans 35 are preferably of the four blade propeller type 48" in diameter, driven by three-quarter horsepower electric motors through a V-belt drive. The $\frac{3}{4}$ H.P. motors are preferably 208-220/440 volt, 3 phase, 60 cycle, 1725 r.p.m., totally enclosed fan cooled. At full load motor speed of 1725 r.p.m., the fans rotate at 336 r.p.m. and deliver 24,300 c.f.m. free delivery.

It will be noted from FIG. 1 that the canopy 10 is preferably free at its bottom lateral extremities and is of such length as to lap over on the surface of the ground along the bottom lateral edges of the stockpile to seal the bottom of canopy 10 against the surface of the ground adjacent the stockpile S. As shown, the lower ends of control ropes 18 and 19 are affixed at equal intervals along the lower lateral edge of canopy 10. It will thus be seen that when control ropes 18 and 19 are pulled upwardly through pulleys 16 and 17 the sides of canopy 10 will be progressively raised until they are furled under the upper, lateral extremities of the frame 11 when it is desired to remove the dried stockpile S or to pile new green lumber within the frame and cover, prior to the drying operation.

As aforesaid, if the canopy-type structure is to be installed within a shed or other type of rectangularly walled and roofed structure the pulleys 16 and 17 may be appropriately hung in pairs at the desired interval, from the walls or roof of the shed, and the canopy may then be installed therein by passing its control ropes 18 and 19 through the appropriate pulleys, the rear wall of the shed serving as the housing for fans 35.

An alternative embodiment of the invention is illustrated in FIGS. 2, 3, 4 and 5 of the drawings. This embodiment of the invention is particularly adapted to installation within a standing rectangular structure comprising vertical sidewalls, a rear wall and a fixed roof. As shown, this embodiment contemplates the provision of a series of hinged baffle panels vertically disposed at equal intervals along the inner surface of the side walls of the building capable of swinging inwardly with respect thereto to an angle of approximately 90° with respect to said side walls, and a further series of parallel and downwardly disposed hinged baffle panels disposed laterally across the width of the roof, between said vertical baffle panels, and capable of downward movement through an arc of 90° with respect thereto, as will be discussed in more detail.

As shown in FIGS. 2 and 3, this "air foil baffle" embodiment of the invention comprises a series of preferably four vertically disposed baffle panels 40 equally spaced along each of the inner side walls of a building or other rectangular structure and hingedly affixed thereto by means of a series of hinges 41 screwed or otherwise suitably affixed to the side walls and to the outer extremities of baffle panels 40 in such fashion that baffle panels 40 may swing inwardly with respect to the lateral walls of the structure to an angle of 90°. As shown, panels 40 are of appreciable width and are preferably formed of plywood or other appropriate material and extend vertically to substantially the full height of the side walls 42 of the structure.

At their inner extremities baffle panels 40 are provided with looped air foil members 44, one of which is shown in cross-sectional detail in FIG. 4 of the drawings. Air foil baffles 44 are preferably formed of canvas or other appropriate flexible and inflatable material and are affixed to the inner extremities of baffle panels by means of a transverse bolt 45, nut 46, washer 47 and a series of spaced separating blocks 48. As shown, the outer ex-

tr extremity of air foil baffle 44 is brought about into a longitudinally disposed loop 49 which is appropriately stitched along a vertical line at 50 to the body of the air foil 44 to provide a housing for a retaining bar 51, formed of wood or other appropriate material, which is disposed within loop 49. Separating blocks 48 are provided at intervals down the length of the inner extremity of panel 40 to separate and space the looped extremity of air foil 44 and bar 51 an appropriate distance outwardly from the surface of baffle panel 40. As shown, blocks 48 are appropriately bored, as are bar 51 and the extremity of panel 40 to allow passage of bolts 45 therethrough at the spaced intervals where separating blocks 48 are placed to maintain air foil 44 in permanently looped condition at the extremity of panel 40 and to provide a series of equally spaced air access vents 52 between the looped extremity 49 of the air foil 44 and the surface of panel 40.

In assembling the air foil and panel structure the following steps are preferably taken. As aforesaid, panel 40 is appropriately bored adjacent its inner edge for passage of bolts 45. Retaining bar 51 is also bored at the same intervals and separating blocks 48 are bored for passage of bolts 45. Bar 51 is slid within loop 49 of air foil 44 and fully seated therein. Appropriate holes are then cut through the looped section 49 of air foil 44 in alignment with the holes in bar 51 and a series of blocks 48 are then placed between bar 51 and the bored extremity of panel 40. Bolts 45 are then passed through the registering holes in bar 51, blocks 48 and panel 40. The opposite, free extremity 53 of air foil 44 is then placed over the threaded extremities of bolts 45, appropriate holes having been cut in extremity 53 for passage of the bolts. Washers 47 and nuts 46 are then applied over the screw threaded extremities of bolts 45, over the end 53 of air foil 44, and nuts 46 are then tightened down to maintain the entire assembly. Auxiliary screws 54 may then be inserted through the end of extremity 53, at intervals, to hold it closely against the outer surface of panel 40. The structure resulting from this operation is a looped air foil bag provided with a series of wide air entrance vents 52 along its open, outer extremity to receive and retain air to inflate the air foil baffle and maintain it in inflated condition during operation of the fan bank located in the inner wall of the structure. It will be noted that the open extremities of the air foil baffles 44 are disposed toward the open end 55 of the structure, whereby air drawn into the open end 55 of the structure by fans 56 disposed in wall 57 thereof will impinge against the outer surfaces of panels 40 and will enter air foil baffles 44 through air passages 52 to inflate the air foil baffle envelopes and swing the entire air foil baffle-panel structure inwardly on hinges 41 until the inner surfaces of the air foil baffles 44 impinge against the outer surfaces of the stacked lumber and conform to the irregular contours thereof to seal off the lateral edges of the stack and prevent escape of air therearound. The top and bottom edges of air foil baffles 44 are preferably closed, by sewing or other means, to prevent escape of air.

As shown in FIGS. 2, 3 and 5, a similar air-foil baffle installation is provided under the roof of the structure, with the panels 60 and air foil baffles 61 hingedly affixed by hinges 62 in parallel across the width of the roof and equally spaced from each other the length thereof, to seal off the upper surface of the lumber stack and prevent escape of air thereover when fans 56 are operating. These top air foil baffles 60—61 are constructed in precisely the same manner as the side wall air foil baffles 40—44, previously described. As shown, roof baffles 60—61 are so disposed in parallel with respect to each other that they alternate with and are equally spaced between vertical baffles 40—44 and fall between vertical baffles 40—44 when in lowered position. Here again, the open necks of air foils 61 are disposed outwardly toward the open end 55 of the enclosure to receive air

drawn through the open end 55 of the enclosure by fans 56, disposed in its rear wall.

In FIG. 5 of the drawings there is illustrated one means of retracting ceiling baffles 60—61 when not in use. The retracting means comprises a rectangular angle member 65, bolted at its upper extremity to the outer surface of panel 60 and extending downwardly and inwardly therefrom at a right angle, adjacent the side wall of the structure. A cable 66 is attached to 67 to the extremity of angle member 65 and passes thence over a vertically disposed pulley 68 suspended beneath the ceiling in a bracket adjacent the side wall and thence over a rectangularly disposed pulley 69 adjacent the side wall and also suspended from the ceiling in a bracket and thence passes laterally across the ceiling to the opposite side wall where it passes over a third, vertically disposed pulley 70, and thence downwardly to a weight 71 affixed at its lower extremity. Weight 71 should be heavier than baffle 60—61. It will be seen that with weight 71 hanging free the baffle 60—61 will be maintained in raised position against the ceiling on hinges 62 by means of cable 66 and angle member 65.

When it is desired to lower the ceiling baffles, weights 71 may be raised or removed from the extremities of cables 66 and the baffles will drop by gravity into a substantially vertical position, as shown in dotted lines in FIGS. 2, 3 and 5, whereby the lower surfaces of air foil baffles 61 will impinge against the top surface of the lumber stack to seal it off and prevent escape of air thereover.

In view of the fact that the ceiling baffles 60—61 are equally spaced between vertically disposed side wall baffles 40—44, there is no possibility of interference or contact between the baffles during opening or closing thereof. Further, due to this alternation of the baffles, a very efficient sealing of the lumber stack results. All baffles are preferably on the order of 3' in width and are spaced some 6'4" apart, the ceiling baffles falling equidistant between vertical baffles 40—44.

The control box and circuit for the fan motors are illustrated respectively in FIGS. 7 and 8 of the drawings, the control circuit being schematically set out in FIG. 8.

Thus, in FIG. 7 is shown one embodiment of a control box 75 for the circuit including a humidity indicator 76 which reads relative humidity on a calibrated scale from 0% to 100% and is provided on the control box for visual observation by the operator to check the operation of the control humidostat. The humidostat 77 controls the fan motor circuit, 78 is a single pole, double throw switch designated "on, off, automatic." When switch 78 is in "automatic" position operation of the fan motors is controlled by the humidostat 77. In "on" position the humidostat 77 is cut out of the circuit and the fans operate regardless of humidity. In "off" position the fans are shut off for loading and unloading lumber from the enclosure. A pilot light 79 is included in the humidostat control circuit, as shown, and burns at all times when the humidostat calls for fan operation.

A schematic showing of the control circuit for the fan motors is shown in FIG. 8 of the drawings, 78 being the single-pole double-throw switch, 77 the humidostat and 79 the pilot light in the humidostat control circuit. A terminal strip for the circuit is indicated at 80, the fan motors at 81 and 82 designates suitable magnetic starters for the fan motors. Thus, with the switch in "on" position the humidostat 77 will be cut out of the control circuit and the fan motors 81 will operate regardless of the humidity. With the switch in "auto" position the fan motors will operate under the control of the humidostat and in "off" position the fan motors will be shut down for loading and unloading the drying enclosure.

The humidostat shown at 77 is preferably a high level humidostat designed to maintain motor operation up to approximately 80—90% relative humidity, at which point the humidostat control will break the circuit to the fan

motors and shut off fan operation. If desired, a second, low level humidostat may also be employed in the control circuit to shut off the motors when the humidity reaches a low level of, say, 40%, to avoid possible splitting and warping of hardwood due to too sudden drying. Such a low level humidostat would be included in the circuit in series with high level humidostat 77 but is now shown in FIG. 8.

The magnetic starters 82 for the fan motors 81 are shown schematically and are of standard and well known type serving to make the starting of the motors a gradual operation and prevent undue initial acceleration thereof.

As previously indicated, the control box 75 for the motor circuit may be placed in any convenient location where it will be readily accessible to the operator.

In the embodiment of the invention shown in FIG. 1 the canvas canopy 10 is preferably rectangular in shape and of such dimensions that it will closely embrace the side and top surfaces of the lumber stack S when in lowered and lashed position to insure that the air drawn through the canopy 10 by the bank of fans 35 will impinge equally against all surfaces of the stacked lumber to afford a uniform and constant drying thereof, eliminating warping, splitting and checking of the lumber and assuring efficient preliminary drying thereof within a period of from 5 to 10 days. Preferably, the lumber stack will be on the order of 18 feet in width, by 12 feet in height and not over 30 feet in depth, from the open forward extremity of the canopy 10 to the fan panel 33 at its rear extremity.

In the embodiment of the invention shown in FIGS. 2, 3, 4 and 5, in which swinging wall and ceiling air foil baffles are utilized in place of the canopy, a lumber stack of substantially the same dimensions, i.e. 18 x 12 x 30, is first formed within the walled enclosure with the individual layers of boards preferably separated by appropriate spacers to allow passage of air over all surfaces thereof equally. With the lumber stack so set up, the side baffles 40-44 are then swung inwardly on their hinges 41 until the inner surfaces of the air foil baffles 44 are in firm contact with the lateral edges of the lumber stack to seal off the lateral edges and prevent the escape of air thereabout. The roof or ceiling baffles 60-61 are then lowered into position by the raising or removal of control weights 71 from cables 66 until the lower surfaces of air foil baffles 61 impinge against the upper surface of the lumber stack, to seal off the upper surface of the stack to the escape of air thereover. Due to the flexible and conformable nature of air foil baffle members 44 and 61 the impinging surfaces thereof will conform to irregularities in the surface of the lumber stack to assure a perfect seal, as shown in FIG. 4 of the drawings.

With the air foil baffles thus extended inwardly into close and conforming contact with the side and top surfaces of the lumber stack the control switch 78 is thrown to "automatic" position, bringing humidostat 77 into control of the motor circuit, the fan motors are started through the magnetic starters 82 and the fan bank begins operation drawing air through the open extremity 55 of the building. This air is pulled into contact with the wall and ceiling air foil baffles and inflates the looped flexible extremities 44 and 61 thereof to hold their inner surfaces rigidly and conformably in contact with the lateral and upper surfaces of the lumber stack. It will thus be seen that the lumber stack is fully sealed along both sides and its top against the escape of air thereover. Thus, substantially the full volume of air drawn through the enclosure by the fans 56 will pass in uniform flow through the lumber stack at a constant velocity, without loss about the edges thereof. This shielding provision insures that drying will be uniform and as rapid as is desired to produce an optimum drying in the lumber stack.

It should be emphasized that with the present system of drying the moisture content is lowered in all the boards

in the stack uniformly and at a constant rate to prevent warp and twist and to insure equal and uniform drying.

When it is desired to remove the lumber from the canopy of the embodiment shown in FIG. 1, the canvas cover 10 is pulled upwardly by means of control ropes 18 and 19, affixed adjacent its lower lateral extremities, until the entire cover is raised free above the stack. The lumber may then be removed at will. A new stack may then be set within the framework and the canopy 10 may then be released to fall downwardly and closely engage the outer surfaces of the lumber stack, prior to the initiation of the new drying cycle. As aforesaid, prior to raising of the canopy 10 by control ropes 18 and 19 the front binding ropes 31 should be untied and removed from rings 30 to free the forward, open extremity of the cover. Conversely, after the cover 10 is dropped over a new, green stack, with its lower lateral edges in contact with the surface of the ground, binding cord 31 should be re-passed through rings 30, as shown in FIG. 1, and clinched at 32 to maintain the forward extremity of the cover in close engagement about the lumber stack.

In the embodiment shown in FIGS. 2 and 3, when the lumber stack is sufficiently dried the fan motors are turned off by switch 78, the lateral baffles 40-44 are then swung inwardly against the side walls until they are flush therewith. The ceiling baffles 60-61 are then pulled upwardly to flush position with the ceiling, by cords 66 and weights 71, as shown in FIG. 5, and the lumber may then be removed and a new stack placed within the enclosure, without interference from the side and ceiling baffles.

As aforesaid, with the installations here illustrated the length of the preliminary drying time for lumber is drastically reduced to from five to ten days from the conventional yard period of three to four months. A highly superior product is evolved, warpage, twisting, end checks and stains being eliminated due to the provision of uniform velocity of air at the proper humidity over all surfaces of the stockpile of green lumber.

With the present installation the speed of drying may be controlled by varying the fan speed to control the volume and velocity of the air stream through the stockpile. Thus, if fan speed is reduced to one half maximum speed, volume and velocity of air passed through the stockpile will be cut in half and drying time doubled.

With the installation shown, on the order of 129,000 cubic feet of air per minute are pulled through the stockpile at a uniform velocity. A single installation of the size and capacity indicated, is capable of drying over a million board feet of one inch thick lumber a year.

After the initial drying in the subject installation the lumber is in perfect condition for final drying in the kilns and a vastly superior finally dried product is the result.

The invention is susceptible of numerous modifications without departing from the spirit thereof. Thus, the dimensions of the enclosure may be varied within wide limits. The type and number of fans used may also be changed, as required. The control circuit may be modified, as desired, and the number and disposition of the baffles shown in the second embodiment of the invention may be varied at will, depending upon the type of lumber being dried and the size of the enclosure being used.

What is claimed is:

In an installation for the preliminary drying of green lumber down to a moisture content of about 20%, an enclosure comprising a roof, side walls and an end wall open at its one extremity opposite to said end wall to the atmosphere, a parallel series of equally spaced fan means mounted in said end wall opposite to said open extremity designed to pull atmospheric, unheated air into and through said enclosure and through a stack of lumber disposed therein and exhaust it to the atmosphere outwardly of said end wall, motors for said fan means mounted in said end wall, a circuit means for controlling said

motors including a high level humidostat set to break said circuit to said motors when atmospheric humidity reaches about 90% whereby unheated atmospheric air of up to 90% relative humidity will be pulled uniformly and at uniform velocity through said lumber stack while atmospheric humidity remains below 90%, regardless of atmospheric temperature.

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