C. M. CUNLIFFE.

ART OF TREATING PAINTED OR VARNISHED ARTICLES.

APPLICATION FILED DEC. 27, 1916.

1,327,314.

Patented Jan. 6, 1920.

3 SHEETS—SHEET 1.

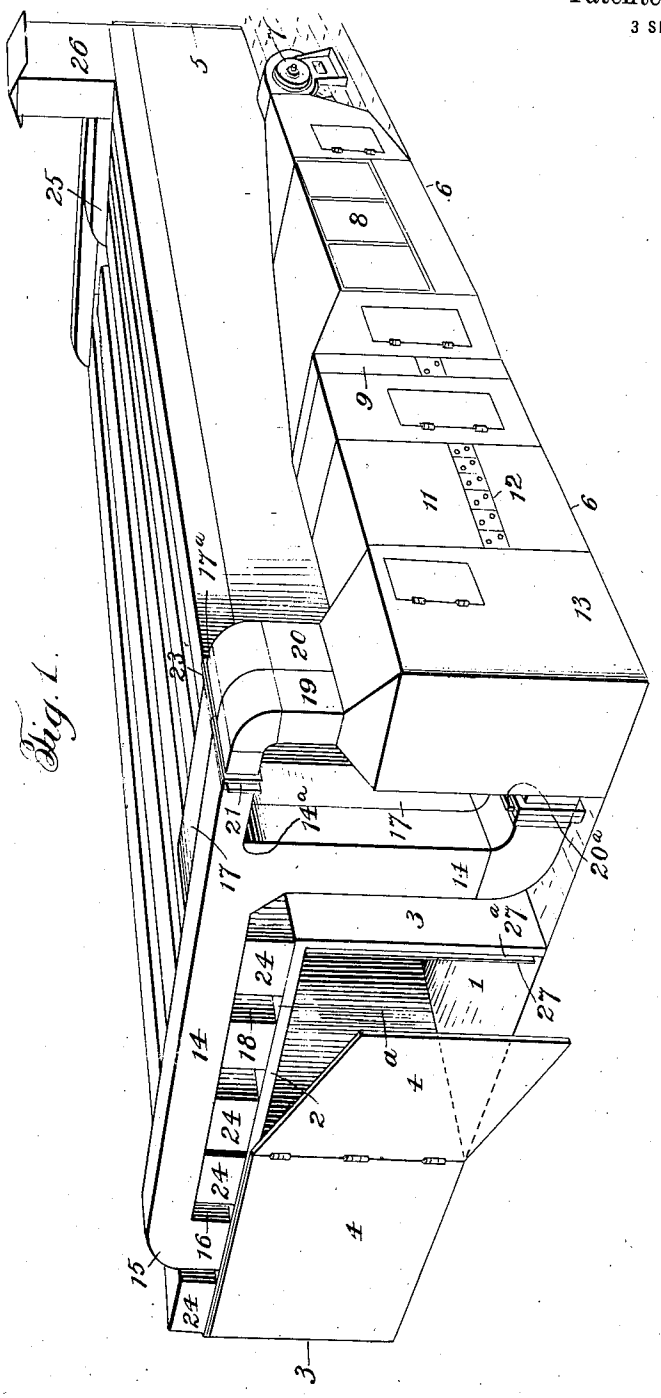


Fig. 1.

Witness:
Jas. E. Hutchinson.

Inventor:
By Cicero M. Cunliffe,
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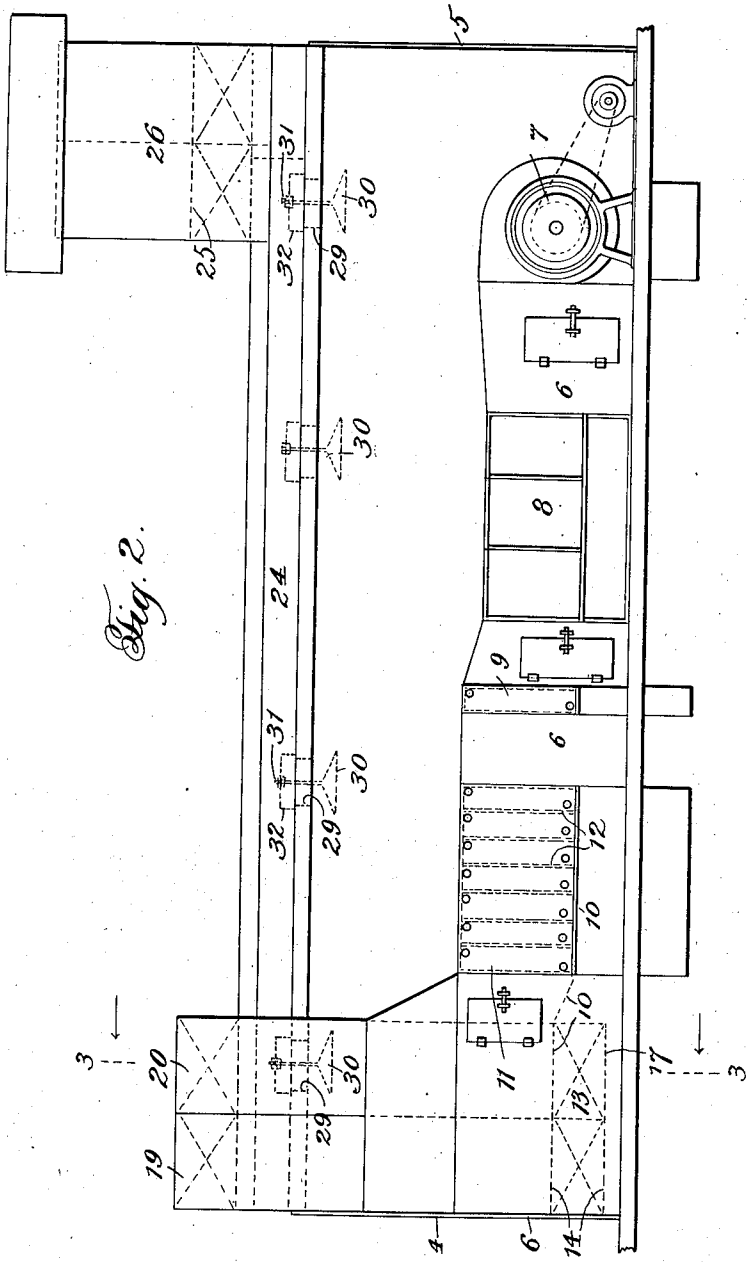


Fig. 2.

Witness:
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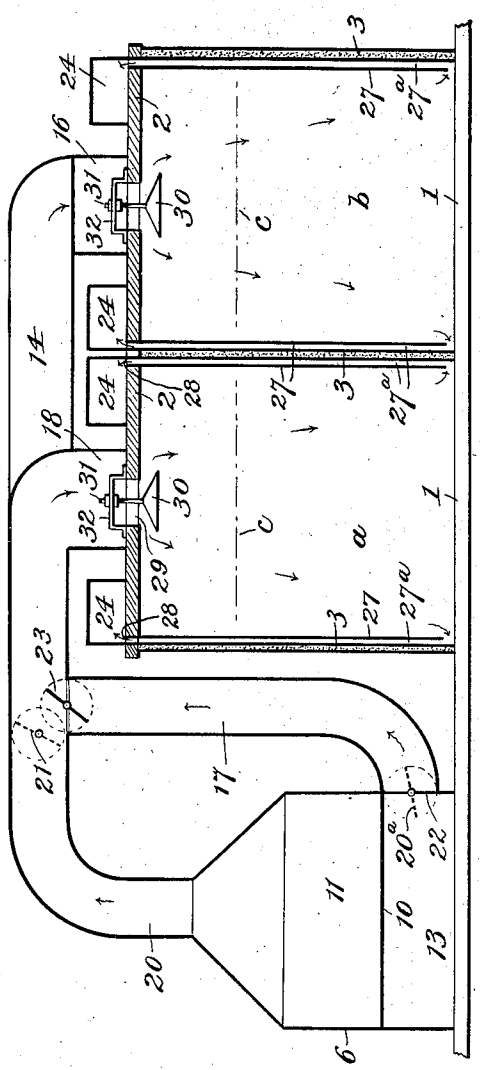
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3 SHEETS—SHEET 3.

Fig. 3.



Inventor:

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UNITED STATES PATENT OFFICE.

CICERO M. CUNLIFFE, OF DETROIT, MICHIGAN, ASSIGNOR TO AMERICAN BLOWER COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF NEW YORK.

ART OF TREATING PAINTED OR VARNISHED ARTICLES.

1,327,314. Specification of Letters Patent. Patented Jan. 6, 1920.

Application filed December 27, 1916. Serial No. 139,202.

To all whom it may concern:

Be it known that I, CICERO M. CUNLIFFE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in the Art of Treating Painted or Varnished Articles, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to the art of treating articles having thereon an application of wet paint, varnish or the like, whereby to properly dry and harden the painted or varnished surfaces of such articles.

In the art to which the invention relates, many attempts have been made to properly and quickly dry freshly painted, varnished or enameled articles of furniture and the like, and while many of these efforts have been successful to an appreciable extent, none with which I am familiar have proven entirely satisfactory, because of certain disadvantages and objections, among which may be mentioned, the great loss of time and expense incident to treatment, the difficulty in obtaining clear and uniform coloring, the danger of streaking, the formation of globules, and the frequent scaling of the varnish, enamel, etc., from the completed articles.

One of the systems largely in use at the present time is what is commonly known as the "baking process," which includes the placing of the articles in a closed oven subjected to high heat, the vapors from the benzin and naphtha being retained in the oven, and these vapors, being all that really vaporize from the paint and varnish, frequently cause the finished article to have light and dark shades, regardless of the original color of the paint or varnish, and also the coating is found to be more or less brittle, and frequently scales off in flakes.

It has also been largely the practice in the paint or varnish drying art to employ in connection with a drying chamber, both forced and natural circulation of air into and through the chamber, and in either case dust is often stirred up and brought in contact with the painted surfaces. Again, the draft or current coming in contact with the wet paint or varnishes causes the formation of ripples or waves. Still further, the direct contact of the articles with the current of air tends to destroy the luster of the finished product; if not over the entire surface, over certain portions thereof, making it necessary to refinish the article until the proper finish and lustre is acquired.

In all prior systems which have been considered more satisfactory for the desired purpose, the processes at best have been exceedingly slow, requiring considerable time for cooling the articles after the first coat before the same can be handled for a second coat, and after the last coat had been applied, it was the general rule to leave the articles stand several days before the same could be wrapped or packed for shipment, and during certain times of the year, the finish would even then become sticky, thus leaving marks of the packing.

It is one of the primary objects of the present invention to provide a system or method of treating painted or varnished surfaces to overcome the above and other existing objections, and with a view to producing a tough, durable, elastic surface, with even luster, which will retain its color in any climate, and make possible the completion of the drying and hardening process in much less time than has heretofore been possible.

While it is contemplated by the present method to treat painted or varnished articles generally, the present method has been extensively and satisfactory employed in connection with the finishing of metal beds, it having been ascertained that beds may be successively enameled in pure white without any variation in color over the entire surface. It has also been ascertained that the present method results in a great saving in time, and that the finished surface will have absolutely no tendency to scale under any pressure or under any condition of treatment or use. Again, it has been found that by the employment of the present method, the finished surface will be continuous and smooth, and devoid of the customary streaks, globules, etc.

In carrying out the present method, it is contemplated to employ a drying chamber, and one of the objects of the invention is to provide a method wherein the air for drying purposes is properly treated prior to its ad-

mission into the chamber, and whereby the proper temperature of said air for the most satisfactory results is maintained.

Another object of the invention is to provide a method wherein the necessary volume of air is employed to carry off the volatile matter as fast as it vaporizes in the drying chamber.

By the improved method, it is also contemplated to prevent the air admitted into the drying chamber from directly striking under force any of the painted surfaces of the article being treated during the process of drying or oxidizing, and in this connection, it is proposed to allow the air as admitted into the drying chamber to expand into an unoccupied space of considerable area above the article to be treated, and allow the air after it has lost substantially all of its velocity to settle down in mass formation upon and gradually envelop the article to be treated in an atmosphere of even temperature and relative humidity with no perceptible movement.

In the successful drying of painted or varnished articles it has been proven to be absolutely necessary to avoid any apparent or appreciable velocity of the drying medium, usually treated air, as otherwise the paint or varnish will dry unevenly and delicate tints will be discolored in spots. A very important feature of the invention therefore resides in that step of the method which requires an air space of considerable area above the articles under process of treatment, and in providing means adjacent the point of admission of the air into the container for diffusing and throwing the air off in all directions horizontally whereby to cause the air to lose its velocity before it begins to settle down somewhat similar to the settling of a fog down in the atmosphere. This feature of the invention is also important in that it results in an equal distribution of temperature throughout the entire treating chamber whereby every portion of the surface of the article will be treated alike.

The improved method embodies a step wherein the air, so soon as it becomes saturated or chilled, is rapidly removed from the drying chamber, and in a manner to prevent any stirring up of dust or the like within said chamber.

In carrying out this feature of the invention, it is contemplated to provide an extended outlet or outlets at the base of the container adapted to deliver the air into a chamber surrounding the container, from which, through the medium of an exhaust fan or the like the air is ejected. This chamber, assuming a plurality of abutting treating containers are employed, acts as an insulating medium with the result that one treating room or container will be substantially independent of its neighbor and while one room is being heated to its highest temperature in the midst of the drying process, the adjacent room may have injected into it at the same time cold humid air in the process of cooling the articles for the purpose of setting the paint and varnish and increasing its luster.

Another feature of the invention includes a preliminary novel treatment of the air prior to its entrance into the drying chamber, whereby to cleanse the air from dust and dirt prior to its entrance into the chamber.

The invention further includes the accurate regulation of the air both as to volume and temperature and the independent regulation of the humidity in any drying chamber of the series employed, whereby the same may be used at will for drying, oxidizing and cooling.

The improved method may be characterized as one wherein the freshly painted or varnished article is placed in a substantially closed drying chamber having an air inlet adjacent the top thereof and an air outlet adjacent the bottom thereof, and the treatment of the air so introduced into such chamber which includes first washing, and purifying the air, subsequently heating the air, causing said heated air as introduced into the chamber to settle in mass formation without velocity upon the article, and introducing at will directly into said chamber, the cooled air prior to the heating treatment.

More particularly the invention includes a process wherein the varnished article is subjected to heat to volatilize the oils in the paint or varnish, with the proper degree of humidity to keep the surface moist until all of the oils are volatilized, and after sufficient time has elapsed to evaporate the oils, subjecting the article to chilled humid air whereby to quickly harden the finish before it has a chance to again absorb any of the volatile oils. This results in producing a fine luster and retains the same perfection of the colors as when applied and further maintains the desirable elasticity of the finish with the hardness, so that it will not crack by expansion or contraction when subquently subjected to heat or cold, all of which are desirable characteristics which have been the aim of every manufacturer who has to use varnish, paint or enamel on metal surfaces.

While as previously described, the present process is particularly valuable to manufacturers of metal articles such as beds, the invention has also been very successful in connection with the treatment of various other articles, for instance, automobile bodies and fenders, phonograph cabinets, various articles of furniture, etc., in which event the process treatment is similar, though the temperature of the drying me-

dium is usually lower, and consequently takes a little longer time to volatilize the oils.

Other and further objects and improvements embodied in the invention will be understood by those skilled in the art from the description to follow which for a clear understanding of the invention is to be considered in connection with the accompanying drawings, wherein I have shown for the purpose of illustration, a convenient and satisfactory embodiment of an apparatus which has been found useful in the carrying out of the contemplated method, though in this connection, it is to be borne in mind that many changes may be made in the type of apparatus employed and still be within the keeping of the invention.

In the description and claims, wherein the terms "paint," "varnish," "enamel" and the like are employed, it is to be understood that these terms are general and are not to be construed in a limited sense, but rather to include any painting or finishing preparation or material for articles of furniture, beds and the like.

In the drawings:—

Figure 1 is a perspective view of my improvements.

Fig. 2 is a side elevation; and

Fig. 3 is a sectional view on line 3—3 of Fig. 2 looking in the direction of the arrows.

With more particular reference to the drawings, wherein like reference numerals refer to corresponding parts throughout the several views, one or more drying chambers are provided, two being shown for the purpose of illustration, it being desirable at times to dry articles in one chamber while certain of the finished articles are simultaneously subjected to a cooling action in the other chamber. These chambers are preferably elongated and have a bottom wall 1, a top wall 2 and side walls 3. Suitable end walls 4 and 5 are provided, one or both of which preferably take the form of movable doors whereby to permit of entrance and delivery of articles before and after treatment.

The air to be delivered into the drying chambers, which latter may be given the reference characters *a* and *b* respectively, is first subjected to proper treatment to thoroughly wash and cleanse the same and regulate the temperature thereof, whereby to obtain the most satisfactory results, and with this in view, an inclosed casing 6 is preferably arranged at one side of the chamber *a*. A suitable power driven fan or blower 7 of any approved type is arranged adjacent one end of the casing 6, the same being adapted to force the air from the outside into and through the casing and into the drying chambers. The casing 6 is divided into various compartments, and adjacent the inlet end thereof is arranged a suitable air washer and purifying means 8. The well known "Sirocco" type of purifier has been found to be well adapted for this purpose, the same usually including a tank to which is connected a centrifugal pump adapted to discharge water into a system of spray pipes having discharge nozzles whereby the water is atomized into a fine mist and the air current as it passes through this mist will become saturated. The saturated air then comes into contact with deflecting plates conveniently zig-zag in construction and arrangement, whereby the air will become freed of dust, dirt or other foreign matter which will stick or cling to the plates to be thereafter washed down into the sump tank therebeneath. Other types of purifiers and washers adapted to cleanse and saturate the air up to the dew point may be employed with satisfactory results if desired. Arranged rearwardly of the washing and purifying chamber is a suitable temperature regulating chamber preferably having therein a heating coil or coils 9 around which the air passes, whereby the temperature of the air is raised above the freezing point in zero weather. The air as it leaves the temperature regulating chamber 9 is adapted to follow one of two courses, and to this end the forward end of the casing 6 is divided by a horizontally extending partition 10 thereby dividing the casing at this end into an upper heating chamber and a lower relatively cool chamber. The upper heating chamber 11 is provided with reheating temperature transmitting coils 12. The lower cool chamber may, if desired, be provided with suitable artificial cooling means, not necessary to illustrate herein.

Leading from the forward outlet end of the casing 6 and adapted to communicate with the chamber 13 beneath the partition 10 is a suitable duct or conduit 14 projecting upwardly over the side of the heating chamber *a*, and thence across the top of the chamber and adapted to communicate with a horizontally extending chamber 16 arranged substantially midway between the sides of the chamber *b*, and forming with the top of said chamber *b* a closed conduit substantially coextensive in length with the top of the chamber *b*. An auxiliary conduit 17 is arranged to the side of the conduit 14 and leads from the lower chamber 13 of the casing 6 upwardly over the side of the heating chamber *a* and thence over the top of said heating chamber and communicates at its end with a horizontally disposed chamber 18 similar in construction to the chamber 16 heretofore described.

Conduits 19 and 20, project upwardly from the top of the casing 6 at a point in communication with the heating chamber 11,

the said conduits connecting the one with the conduit 14 at the point 14^a and the other with the conduit 17 at the point 17^a. A suitable valve 20^a of any desirable construction is adapted to regulate the air admitted from the chamber 13 into the conduit 14, or to entirely close communication between these members. A similar valve 21 is adapted to control or regulate the air admitted from the conduit 19 into the conduit 14 or to entirely close this means of communication between these members.

Likewise, valves 22 and 23 respectively are arranged in the conduits 17 and 20, being the same in principle and operation as the valves 20^a and 21 respectively heretofore described. Extending longitudinally of the chambers *a* and *b* upon the top walls thereof are suitable outlet air conduits 24 adapted to discharge into a chamber 25 projecting transversely over the top walls 2 of the drying chambers and communicating with an outlet pipe 26, which may communicate with the outside, or with any suitable draft appliance, not necessary to illustrate herein. Arranged within the chambers *a* and *b* are suitable auxiliary side walls, flanges or diaphragms 27, the latter being arranged adjacent to, but spaced from the side walls 3 and extending from the top wall 2 to a point adjacent the bottom wall 1, the space between the lower edge of the side walls 27 and bottom wall 1 being relatively narrow whereby to provide a restricted passage between the chambers *a* and *b* and the chambers 27^a formed by the walls 3 and 27. The chambers 27^a are adapted to have communication with the conduits 24 through the medium of suitable apertures in the top walls 2 of the chambers *a* and *b*, the said apertures being illustrated at 28 and being arranged at suitable intervals throughout the length of the top walls 2.

The top walls 2 are provided with suitable openings 29 arranged at suitable intervals throughout the length of the same and substantially midway of the sides thereof, whereby to establish communication between the chambers *a* and *b* and the chambers 18 and 16, respectively. The openings 29 are so spaced as to give the most even distribution of the air into the chambers *a* and *b* that is obtainable. Arranged below each of the openings 29 is a suitable horizontally disposed disk 30 of a diameter somewhat greater than the diameter of the openings 29 and preferably cone-shaped. The disk members 30 are preferably adjustably supported through the medium of a stem 31 threaded into a suitable bracket 32 upon the top walls 2 of the heating chambers whereby to regulate the entrance of the air into the chambers *a* and *b* through the openings 29.

It being understood that the drying chambers *a* and *b* are of a height considerably above that of the articles to be treated, whereby to provide thereabove an extended distribution space of considerable area, said space being generally represented above the dotted lines *c*, the method herein contemplated may be described as being substantially the following.

The articles to be treated, say for instance, bed frames, having applied thereto a coating of paint, varnish, enamel or the like, are placed within the chambers *a* and *b* when the end doors are closed, whereby to provide substantially air tight compartments. The air to be used in the drying process is properly conditioned by passing through the air washer or purifier which removes any dirt or dust, and the air becoming saturated up to the dew point, passes around the primary heating or tempering coil 9, where the temperature is raised above the freezing point in zero weather. Assuming the valves 20^a and 22 to be closed and the valves 21 and 23 open, the air is forced through the heating chamber 11 having therein the re-heating coils from whence the same is discharged through the conduits 19 and 20 into the conduits 14 and 17, which latter communicate with the longitudinally extending conduits 16 and 18. From the conduits 16 and 18, the air is forced through the openings 29 into the treating chambers, the air being of the proper temperature to accomplish the evaporating functions. As the air leaves the openings 29 in the top of the drying chambers, it will be immediately deflected horizontally, through the medium of the deflecting members 30 and allowed to expand into the large space or expanding chamber above the articles to be treated. In the said expanding chamber, the air will become thoroughly distributed and will expend its velocity with the result that the same will settle down gradually, in mass formation and envelop the articles without any perceptible velocity, and without any tendency to stir up any dust that may be in the treating chamber. The heated air as it is brought into association with the articles to be treated is preferably saturated at about the same temperature as the articles when they are placed within the treating chambers and said articles have a tendency to lower the temperature of the air, thus bringing it down nearer to the point of saturation. This prevents the paint or varnish coating from forming a skin, and causes any drips or unequal flow in the application of the paints or varnishes to flow and spread out into an even coating. The outlet between the heating chambers *a* and *b* and the chambers 27^a between the side walls 3 and the vertical diaphragms or aprons 27, is arranged in depth so as to maintain slight static pressure in the drying chamber, and,

with the arrangement illustrated the pressure being equalized, the velocity down and over the article is not perceptible until it comes to the narrow outlet at the base of the side walls or flanges 27, when the air due to the action of the draft appliance 26 moves rapidly through the chambers 27ª, conduits 24, and outlet 26 to the point of discharge.

The air outlet space provided between the walls 3 and 27 of the drying chamber acts as an insulation against adjoining chambers or the surrounding room, and does not affect the temperature in either of the drying chambers, so that cold air may be forced into one drying chamber while hot air is being forced into the next adjacent chamber without reducing the temperature in the drying chamber. The diaphragms 27 like the walls of the drying chambers *a* and *b* are preferably formed of sheet metal. By providing a number of closely associated openings 29 in the top wall of the chambers *a* and *b* for the admission of air and having the elongated slots along the floor for the escape of air, there results a thoroughly even distribution of the air and an even temperature in all parts of the drying chamber.

The articles to be treated are maintained in the closed chamber and subjected to the drying operation of the heated air, say from two to three hours, according to the particular application, when the valves 21 and 23 are closed and the valves 20ª and 22 are opened, thereby admitting the cool air directly from the chamber 13 into the chambers *a* and *b* through the inlets 29 heretofore described. The cool air being nearly saturated when it comes in contact with the articles, the painted or varnished surfaces are rapidly cooled, thereby producing a very fine finish and increasing the luster and hardness of the surface.

Very satisfactory results have been accomplished having the air leave the washer or purifier at a relatively low temperature, say from sixty to seventy degrees and saturated, and when the heated air leaves the heating chamber and enters the drying chamber, the same is approximately 240° or thereabout. In prior systems adapted for the purpose to which the present invention is intended, it was considered impossible to subject the varnished articles in the drying process to a higher temperature than 190°, owing to the tendency to cause discoloration of the lighter tints, resulting in streaking, etc. In the present system, while the oils in the varnish may be vaporized at about 130° with fairly satisfactory results, it is possible to carry the temperature as far as 240°, and the character of the finish is just as perfect as when treated at a lower temperature, and because of the high temperature, there results a considerable reduction of the time necessary to dry the varnish, approximately 50% of the time usually required for this purpose. When it comes in contact with the article, say at a temperature of about 70°, the temperature will drop and the relative humidity be increased.

This dropping in temperature and rise in humidity prevents the paint from skinning, and allows the same to run out evenly over the article. In the cooling operation, the saturated air tends to give the articles a finer and better gloss or finish.

The finished product treated in accordance with the method above described will be found to have a continuous smooth and even distribution of the finishing material, entirely free from spots, streaks, blemishes or discoloration, and regardless of the uses to which the articles are put there is no likelihood of the paint or varnish scaling. Then again, because of the thorough drying and cooling process contemplated, the articles may be finished in a much shorter period than is possible in prior methods, and are in condition on completion of the treatment either to be stored or wrapped and shipped, regardless of the temperature, without any resultant injurious effect upon the finish. The above meritorious results are largely due to the large air space provided by the heating chambers above the articles positioned in the chambers, and the diffusion of the air in all directions horizontally into said vacant space, whereby the air settles down without velocity and envelops the articles under the treatment. Then again, by reason of the surrounding air chambers, the treating chambers are insulated from the effect of outside temperatures, or from the effect of a neighboring chamber, assuming it is desired to continue the drying operation in one chamber simultaneously with the cooling operation in the adjacent chamber. While the treated air falls down and envelops the articles in the treating chamber without velocity, the elongated outlet at the floor or base of the chamber permits the spent air to be rapidly removed through the medium of the fan as referred to.

The volume of air introduced into each chamber may be controlled independently of the volume of air introduced into another chamber through the medium of the valves or dampers and also by regulating the speed of the fan which forces the air into the chambers. Likewise, the temperature of the air may be nicely regulated by the controlling dampers as well as by the regulation of steam pressure in the heating pipes.

No claims herein are specifically directed to an apparatus, but an apparatus useful in carrying out the method, constitutes the subject matter of a copending application filed

by me on December 27, 1916, relating to apparatus for treating painted or varnished articles, in which I have illustrated, described and claimed certain features of my invention herein described and not claimed.

What I claim is:—

1. The method of drying varnished articles which consists in placing the articles with the varnish applied thereto into the lower portion of an inclosed drying chamber introducing air into the upper portion of the drying chamber so as to be there disseminated into an unoccupied space of considerable area, and removing the air from the lower portion of the chamber whereby the air introduced at the top after it has lost substantially all of its velocity will settle down in mass formation upon and gradually envelop the article.

2. The method of treating varnished articles, to dry and cool the same, which consists in placing the articles in the lower part of a substantially closed chamber, of a size and construction to leave an unoccupied space of considerable area above the articles, introducing air into a washing chamber, and causing said air to enter the drying chamber at the top thereof in heated or cooled condition at will, and allowing the air to escape from said chamber.

3. The method of treating varnished articles which consists in placing the articles in a substantially closed drying chamber whereby to leave a space of considerable area above the articles, introducing air into said chamber centrally of the top thereof, subjecting the air before its introduction into said chamber first to washing and then heating, causing the air upon its introduction into the upper portion of the chamber to first lose its velocity and then quietly settle in mass formation upon the articles, and permitting the air to escape.

4. The method of treating varnished articles which consists in placing the articles in the lower portion of a substantially closed drying chamber, treating air by first washing and subsequently heating the same, and thereupon introducing the treated air into the top of the chamber adjacent the center thereof, causing the air to lose its velocity on its introduction into the chamber, and thereafter permitting the same to settle in mass formation upon the articles, permitting the air to escape at the base of the container, and subsequently introducing washed air directly into said chamber.

5. The art of treating varnished articles which consists in placing the articles with a fresh application of varnish or enamel in a closed chamber, adjacent the bottom thereof, the top wall of which chamber is disposed at a point considerably above the top of the articles whereby to provide an unoccupied space of considerable area, subjecting air to a cooling and moistening agency, thereafter subjecting the treated air to a temperature increasing agency, introducing the so treated air under pressure into the top of the chamber, preventing the air on its entrance into the chamber from directly contacting with the varnished article under pressure and first diffusing the air horizontally on its introduction, and thereafter allowing the air to fall in a solid mass without perceptible velocity into contact with the articles.

6. The art of treating varnished articles such as bedsteads and the like, which consists in placing the articles in the lower portion of a closed chamber, the top of which is disposed a considerable distance above the tops of the articles, whereby to provide an unoccupied space of considerable area, subjecting air to a cooling and washing agency, subjecting the treated air to a temperature increasing agency, introducing the so treated air under pressure into the top of the chamber at the center thereof, diffusing the air horizontally in all directions on its introduction into the said chamber, and thereafter allowing the air to fall in a solid mass without perceptible velocity into contact with the articles, and rapidly withdrawing the air from the bottom of the chamber at points spaced laterally from the inlet at the top of the chamber.

7. The art of drying varnished articles such as metal beds which consists in placing the freshly varnished articles to be treated in a substantially closed chamber, continuously introducing treated air into the chamber adjacent the top thereof, causing the air to drop and envelop the articles in mass formation and without perceptible velocity, and allowing the air to escape adjacent the base of the chamber at a point spaced laterally from the inlet at the top of the chamber.

8. The art of drying iron bedsteads and the like having a fresh application of paint or varnish, which consists in placing the article while still wet, in the lower portion of a closed drying chamber of a height considerably greater than that of the article, introducing treated air into the chamber adjacent the top thereof, causing the air to diffuse and drop in mass formation upon and over the articles in an atmosphere of substantially even temperature and relative humidity and with no perceptible movement, and allowing the air to escape from the chamber adjacent the bottom thereof.

9. The art of drying iron beds and the like having a fresh application of paint or varnish, which consists in placing the articles in the lower portion of a closed drying chamber of a size to provide an unoccupied air space of considerable area above the articles, introducing treated air into the chamber adjacent the top thereof, and at

the center, causing the air to disseminate and drop in mass formation upon and over the article in an atmosphere of substantially even temperature and relative humidity and with no perceptible movement, and allowing the air to escape from the chamber adjacent the side of the bottom thereof, and rapidly removing the escaped air to the outside.

10. The art of treating freshly painted or enameled iron beds and the like, which consists in placing the bed in the lower portion of a closed treating chamber of a height to provide an unoccupied upper space of considerable area above the article, subjected the air to washing and drying treatment, introducing the treated air into the upper portion of the chamber causing the same to fall only after it has lost its velocity to envelop the article, rapidly discharging the air from the base of the chamber, and finally introducing cooled air into the chamber adjacent the top thereof and withdrawing the same from the base of the chamber.

11. The art of treating freshly varnished articles to dry and cool the same which consists in placing the articles in the lower portion of a closed chamber of a size to provide an unoccupied space of considerable area above the article, subjecting air to a washing process and subjecting said washed air to a heating process and introducing the same into the treating chamber at the top of said unoccupied space, withdrawing said air from the base of the chamber and subsequently introducing washed air without heating directly into the treating chamber at the top thereof and subsequently removing the same at the base thereof.

12. The art of treating freshly varnished articles to dry and cool the same which consists in placing the articles in a closed chamber, subjecting air to a washing process and subjecting said washed air to a heating process and introducing the same into the treating chamber, withdrawing said air and subsequently introducing washed air without heating directly into the treating chamber and subsequently removing the same, the said air in both instances being introduced at the top of the chamber and allowed to fall in mass formation without perceptible velocity downwardly over the articles and escaping adjacent the bottom of the chamber.

13. The art of treating freshly varnished articles which consists in placing the article in a closed chamber, subjecting air to a cooling and moistening agency to reduce the temperature and increase the humidity to a point of approximately complete saturation, thereafter subjecting the air to a heating medium and introducing the same into the drying chamber and causing the same to envelop the articles without substantial velocity and free from currents, allowing the air as the temperature thereof is reduced and humidity increased to escape from the chamber adjacent the base thereof, and allowing said escaped air to pass over the outer surface of the walls of the chamber, substantially as and for the purpose described.

14. The improved method of treating painted articles which consists in introducing a treating medium into a treating chamber of a height considerably greater than that of the painted article positioned in said chamber, after subjecting said treating medium to a purifying and temperature regulating process, causing said treating medium to be diffused horizontally at the top of the container and in the space above the article, allowing the treating medium after it has expanded its velocity to envelop the article, and finally permitting the treating medium to escape from the base of the container.

15. The method of treating painted articles which consists in placing the articles in a treating chamber having an air passage overlying one wall thereof and maintaining above the article an unobstructed air space of considerable area, treating air to cleanse the same and to regulate the temperature thereof, introducing said air into the top of the chamber, causing said air to lose its velocity in the space above the article, and withdrawing the air from the base of the chamber and introducing the same into the air passage surrounding the wall of the treating chamber.

16. The method of treating painted or varnished articles which consists in placing the articles in chambers separated from one another by air spaces, introducing cleansed and temperature regulated air into the respective chambers at the top thereof, causing said air to lose its velocity in the space above the articles whereby to envelope without force or velocity the articles to be treated, and allowing said air to escape from the base of the chambers into said intervening air spaces.

17. The process of drying and finishing varnished or painted articles which consists in applying heated air to volatilize the oils in the paint or varnish with the proper degree of humidity to keep the surface moist until all the oils are volatilized, and after they are so evaporated, subjecting the article to the action of chilled humid air to quickly harden the finish before it has a chance to again absorb any of the volatile oils, the heated and chilled air being subjected to an influence whereby it will envelop the article without force or velocity.

18. The method of treating varnished articles which consists in placing the article with an application of varnish thereon in a substantially closed chamber, introducing

into said chamber air at a high temperature, say approximately 240° withdrawing said air from the chamber and introducing cool air thereinto, the heated and cooled air being subjected to treatment whereby it will envelop the article without force or velocity.

19. The method of treating freshly painted or enameled bedsteads and the like which consists in placing the article into the lower portion of an inclosed chamber of a size to provide a space of considerable area above the article, and which said chamber has an air passage overlying its side wall, introducing treated air into the top portion of the chamber at the center thereof, preventing said air from immediately contacting with the article and causing the same to diffuse in different directions laterally in the space above the articles, allowing the air to fall after it has lost its velocity and to envelop the article, and removing the said air at the base of the container and causing the same to pass through said air passage.

20. The method of treating freshly enameled or varnished iron bedsteads and the like, which consists in placing the articles in an inclosed chamber, introducing temperature regulated air into said chamber at the top thereof, causing the air as introduced to lose its velocity and thereafter permitting the same to fall in mass formation and envelop the articles, causing the air to escape from the base of the chamber and to thereafter travel upwardly over the outer wall of said chamber.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CICERO M. CUNLIFFE.

Witnesses:
PAUL C. DICKINSON,
H. M. ZERBE.