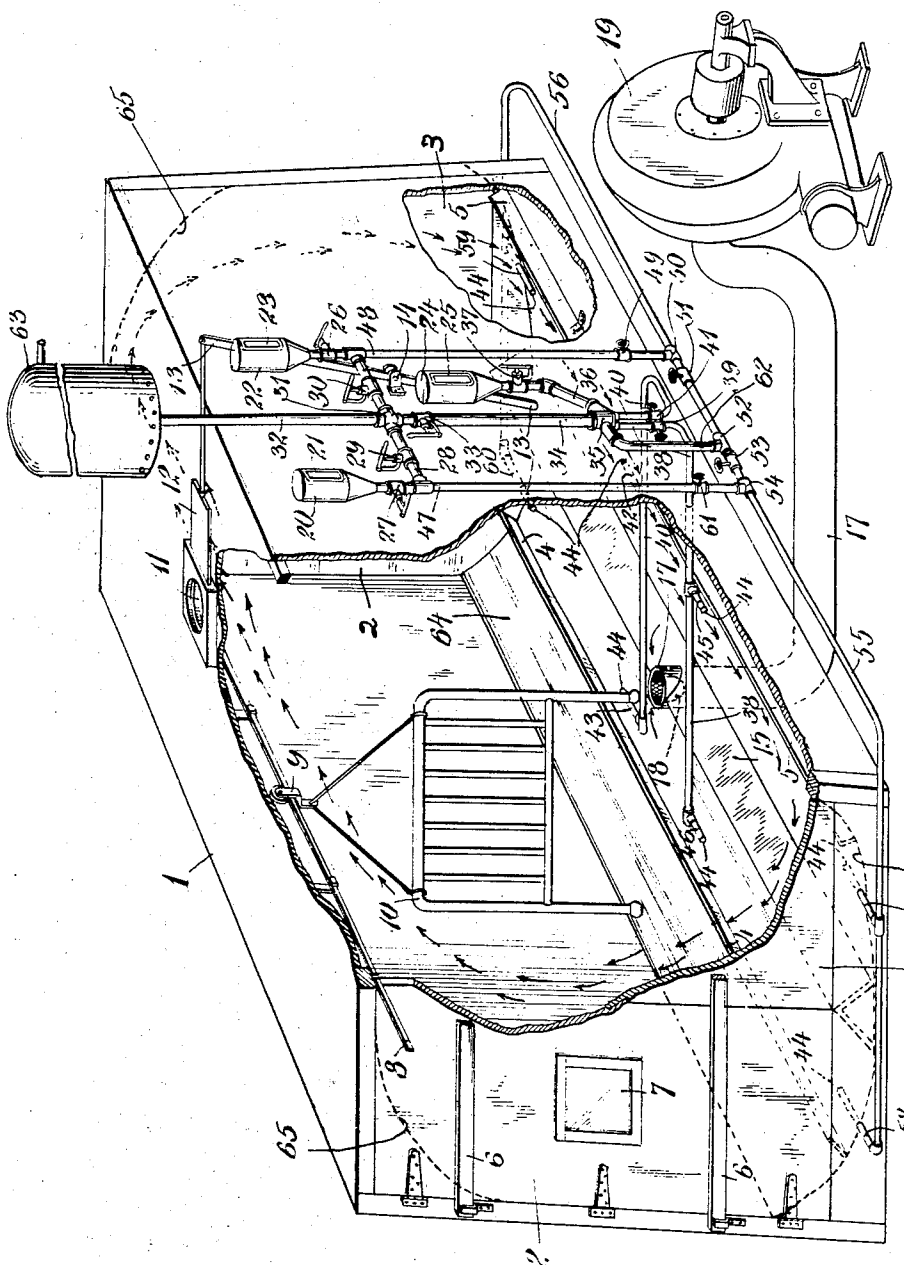
J. L. MOORE & O. J. McKEE.

APPARATUS FOR APPLYING BRONZE, &c., TO ARTICLES.

APPLICATION FILED JAN. 19, 1911.

1,068,915. Patented July 29, 1913.



WITNESSES

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JACOB L. MOORE AND OSCAR J. McKEE, OF BUTLER, PENNSYLVANIA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO BRADLEY & VROOMAN CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

APPARATUS FOR APPLYING BRONZE, &c., TO ARTICLES.

1,068,915. Specification of Letters Patent. Patented July 29, 1913.

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To all whom it may concern:

Be it known that we, JACOB L. MOORE and OSCAR J. MCKEE, citizens of the United States, and residents of Butler, county of Butler, and State of Pennsylvania, have made certain new and useful Inventions Relating to Apparatus for Applying Bronze, &c., to Articles, of which the following is a specification, taken in connection with the accompanying drawing, which forms part of the same.

This invention relates to apparatus for applying bronze powder or other coating material to articles such as furniture or the like as by placing the suitably sized articles in a closed chamber in which violent circulating air currents are maintained charged with the impalpable bronze powder or other colored or coating material so that the coating material is brought forcibly into contact with the sized surfaces of the articles to which the particles adhere and form a continuous coating substantially uniformly covering the entire article regardless of the character or contour of its surface. When the coating action has been effected to the desired extent, surplus coating material may be removed from the chamber by exhausting the air therefrom while maintaining the air in circulation, the suspended coating material being separated from the exhausted air by a suitable collecting device so that it may be reused.

The accompanying drawing is a perspective view showing in a somewhat diagrammatic manner, an illustrative embodiment of this apparatus.

1 is a closed chamber preferably having its side and end walls slightly upwardly converging or contracting and having suitable closely fitting doors, such as 2, 3 at one or both ends thereof. Suitable fastenings of any desired description such as the bars 6 being used to hold the doors closed. Suitable glazed or other observation openings such as 7 may be formed in the doors or other parts of the chamber if desired. For some purposes it its desirable to provide internal lining or deflecting members in the chamber, such for example, as the curved lining 65 at the upper lateral edges of the chamber and the curved bottom lining 64, as indicated, and suitable deflectors or distributers may also be employed to further promote the uniform circulation of the air currents in connection with the circulating means employed. In the drawing, a central angular deflector 15 is indicated in connection with laterally disposed distributers or deflectors 4, 5 in the form of boards or flanges projecting from the curved bottom lining 64. Any desired supporting means may be used in connection with the chamber to properly support the articles therein and provide for their convenient insertion and removal. A supporting track 8 is indicated adjacent the top of the chamber, with which a suitable support or trolley 9 may coöperate so as to suspend the articles 10 thereon and conveniently move them into the chamber when the doors have been opened and the removable section of the track 8 brought into alinement as indicated. Any desired means may be used to create a violent circulation of the air in this closed coating chamber and preferably maintain a substantially closed circulation therein during the coating operation, that is, keep up the violent circulation or agitation of the air in the chamber without supplying thereto undesirably large quantities of additional air. The use of a limited volume of high pressure air may be employed for this purpose which may be discharged into the chamber in the form of any desired number of high pressure impelling jets located at various parts of the chamber and pointed in different directions which set up violent air currents within the chamber so as to bring the suspended coating material into impingement with the sized articles and form the desired coating thereon. As indicated in the drawing, the high pressure air at a pressure of one hundred pounds or so to the square inch may be supplied to the reservoir 63 from an air compressor or other source and delivered therefrom through the pipe 32 when the quick-opening operating valve 33 is opened so as to pass through the pipe 34 with which

the coupling 35 and pipe 62 communicate through the cutoff valve 51 with the end jet pipe 56. This jet pipe may be provided with any desired number of end nozzle pipes such as 59, 60 formed with jet nozzles 44 of any desired character so as to discharge into the coating chamber, high pressure impelling jets of air and create powerful air currents therein so as to carry the suspended coating material into contact with the sized articles; it being understood of course, that much lower initial pressure may be used, preferably in connection with larger amounts of the impelling air to secure substantially the same energy and results. The arrows indicate diagrammatically the general direction of the closed circulation caused by the impelling air jet issuing from the end nozzle pipe 59, it being of course understood that a closed circulating current in this same general direction around the chamber would be promoted by allowing the high pressure air to issue through similar nozzles 44 in the central nozzle pipes 45, 46 connected through the central jet pipe 38 and control valve 39 with the coupling 35. If desired, circulating currents in the opposite direction may be caused by closing this control valve and the cutoff valve 51 and opening the control valve 41 so as to admit air from the supply pipe to the central jet pipe 40 and central nozzle pipes 42, 43 provided with suitable nozzles 44. By opening the cutoff valve 53 under these conditions, high pressure air would be similarly admitted to the end jet pipe 55 connected with the end nozzle pipes 57, 58 so as to discharge high pressure impelling jets from the connected end nozzles 44.

Bronze powder or other finely divided or impalpable coating material may be supplied to the circulating air within the coating chamber in any desired way and this may be effectually accomplished by having a suitable receiver such as 24 which may be closed at its upper end in any desired way and provided with a sight glass 25 to indicate the amount of material therein. The funnel shaped lower portion of this receiver communicates through the quick-opening valve 37 with the pipe 36 so as to supply the powdered coating material to the impelling jets to be thereby carried into the chamber. It is of course understood that by quickly opening this feed valve 37 at the beginning of the operation, the desired amount of coating material may be fed into the inclined pipe 36 or if desired, it may be gradually fed thereto, which is more desirable for some purposes. If desired, also a separate receiver may be provided in connection with the central jet nozzles and in connection with the jet nozzles at each end of the chamber as indicated in the drawings. The similarly constructed receiver 20, provided with the sight glass 21 may be connected through the quick-opening or other valve 27 with the pipe 47, which may receive air from the reservoir through the pipe 28 when the valve 29 therein is opened. In this way, by opening the cutoff valve 61 and closing the cutoff valve 53 between the T couplings 52 and 54, a separate supply of high pressure air charged with coating material from the reservoir 20 may be injected into the chamber through the end jet pipe 55 and connected nozzles. The similar reservoir 22 having a suitable sight feed 23 may be connected through the feed valve 26 with the pipe 48. This pipe may be supplied with high pressure air from the reservoir when the operating valve 30 is opened and the cutoff valve 49 opened so as to supply air and coating material to the end jet pipe 56 and connected nozzles, the cutoff valve 51 inside the coupling 50 being preferably closed under these conditions.

When the sized articles are sufficiently coated, it is highly desirable to remove from the body of the chamber, surplus coating material so as to clear the air within the chamber, of the suspended pulverized coating material and prevent waste thereof and also minimize its undesirable or injurious effects on workmen. Any suitable arrangement or means for removing the surplus bronze or other coating material from the chamber may be employed, preferably in connection with the agitating devices to keep the air of the chamber circulating or agitated during this removing operation. If desired, a suitable suction device may be employed to remove or exhaust the impregnated air of the chamber while it is still circulating and collect the suspended particles of coloring matter in the air as it is removed. As indicated in the drawing, a suction pipe 17 may have its opening adjacent the bottom of the chamber and be connected with a suitable suction device or fan 19 so as to withdraw the air from the chamber and simultaneously remove the coloring matter therefrom in a suitable collector which may be located anywhere in connection with this suction device, for instance, the foraminous or filtering collector 18 may be located in the opening of this suction pipe. It is desirable in this connection to have a valved air inlet to assist in this clearing of the chamber and one or more suitable air inlets 11 may be arranged adjacent the top of the chamber and controlled by valves such as 12 connected with the manually operated inlet lever 13 pivoted in a suitable bracket or bearing 14 on the side of the chamber.

The articles to be bronzed or coated are first sized with a suitable adhesive varnish or composition which is allowed to dry

sufficiently to become properly sticky or tacky and then, the sized articles are placed in the coating chamber and the chamber kept tightly closed during the coating operation. The air in the chamber may be put in violent circulation by the operation of the desired number of high pressure small volume impelling jets issuing from the jet nozzles which may be located at various parts of the chamber and which when moving adjacent the floor thereof, as illustrated, tend to pick up coloring material therefrom. The impalpable bronze powder or other coating material is supplied to the chamber so as to become suspended in air currents violently circulating therein. In this way, the suspended coating material is carried into impingement with the sized surface of the articles and the particles forcibly impelled into contact therewith so as to be firmly adherent thereto or become more or less embedded therein and be held in position as soon as the size has dried. The rapidly moving clouds of coating material thus come into impingement with all parts of the sized articles and form an adherent substantially uniform coating which may be smoothed or burnished to the desired extent by the continued action of the circulating coating material carried by the air currents in the chamber which tend to remove all coating material from the article beyond what is necessary for a continuous coating thereon; it being of course understood that by shortening this operation or by using less forcible air currents the coating may be given a desirable mat surface which still more closely resembles ordinary brass. When this coating action has been effected to the desired extent which may be accomplished in a very few minutes with this apparatus, the surplus coating material may be substantially removed from the articles and from the air within the chamber by putting the suction device in operation and simultaneously opening the air inlet while the air within the chamber is still kept in violent circulation as by the impelling air jets described. Under these conditions, the charged air in the chamber is quickly exhausted and the coating material suspended therein, rapidly removed therefrom as by the collector 18 so that the air in the chamber may be rendered practically clear and free from dust or particles and the surplus coating material largely or substantially completely removed from the articles. It is of course understood that by reversing the direction of the operating impelling jets within the air chamber a single closed circulation may be set up therein in the direction of the arrows or in the contrary direction or if desired, a violent whirling or agitation of the air in the chamber may be effected by the simultaneous operation of the jet nozzles at the ends and at the center of the chamber although of course, additional impelling jet nozzles or other air circulation means may be located at other points in the chamber if desired. Such change of direction in the powerful applying air currents in the chamber is in some cases desirable to quickly and thoroughly coat articles having recessed or other special surfaces.

Having described this invention in connection with illustrative embodiments, forms, proportions, arrangements, and methods of operation, to the details of which disclosure this invention is not of course to be limited, what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims.

We claim—

1. The apparatus for applying bronze powder or other coating material to articles comprising a closed chamber having upwardly contracting walls and provided with doors at opposite ends having fastenings and observation openings, said chamber being provided with a track and supporting means operating in connection therewith and having deflecting devices within said chamber to deflect the air currents therein, a source of high pressure compressed air and valved connections comprising jet nozzles opening in different directions in various parts of said chamber to create violent closed circulation of air within the same, receivers for the coating material and feed valves controlling the admission of said coating material to said valved connections to inject the same into said chamber and bring said coating material while suspended in the air currents into impingement with sized articles in said chamber, a suction pipe and suction device connected with an opening adjacent the bottom of said chamber to remove the surplus coating material therefrom, a collector located in said suction pipe, an air inlet and valve mounted in the top of said chamber to admit air thereto and a manually operated inlet lever connected to said valve to operate the same.

2. The apparatus for applying bronze powder or other coating materials to articles comprising a closed chamber having upwardly contracting walls and provided with doors at opposite ends having fastenings and observation openings, said chamber being provided with a track and supporting means operating in connection therewith and having deflecting devices within said chamber to deflect the air currents therein, a source of high pressure compressed air and connected jet nozzles opening within said chamber to create violent closed circulation of air within the same, a receiver for the coating material and feeding means to feed

said coating material into engagement with the air currents in said chamber and bring said coating material while suspended in the circulating air currents into impingement with sized articles in said chamber, a suction pipe and suction device connected with an opening in said chamber to remove the surplus coating material thereon and an air inlet valve to admit air to said chamber.

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