C. L. BURDICK & W. B. MAKINS.

MACHINE FOR COATING SURFACES WITH LIQUIDS.

APPLICATION FILED MAR. 4, 1918.

1,294,765. Patented Feb. 18, 1919.

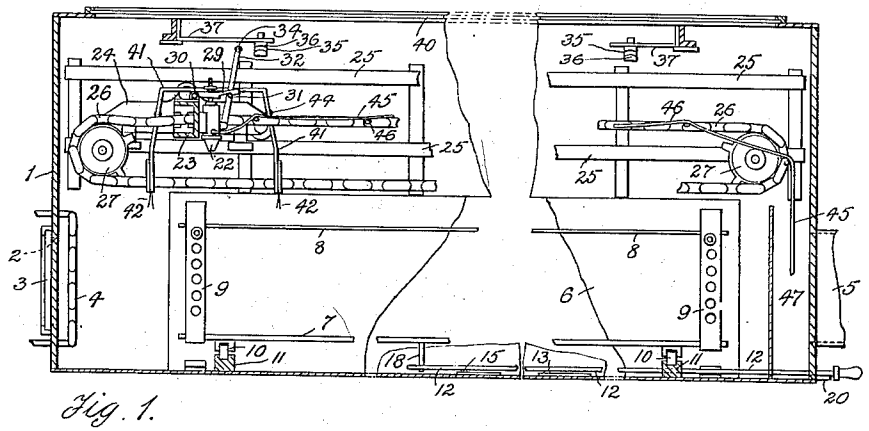


Fig. 1.

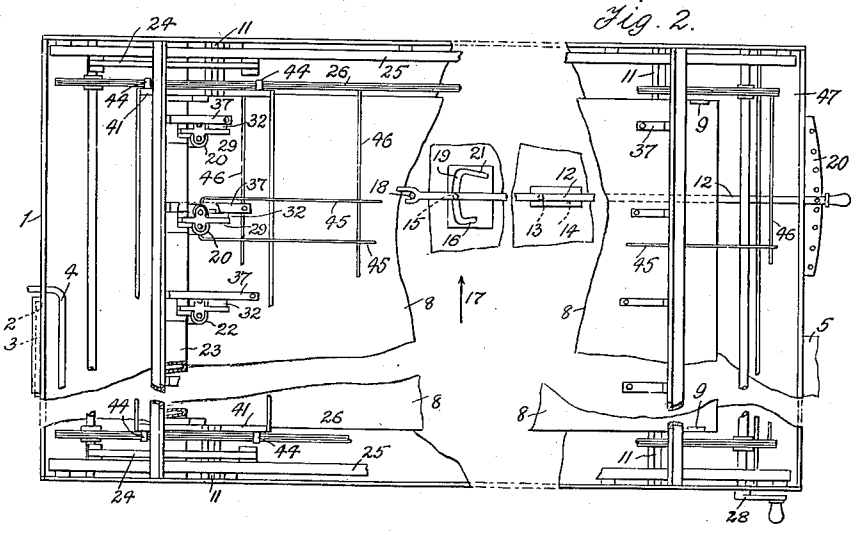


Fig. 2.

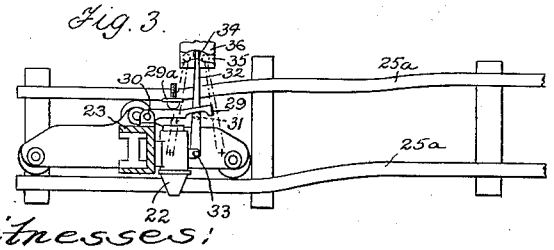


Fig. 3.

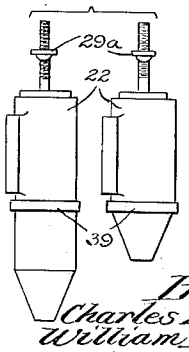


Fig. 4.

Witnesses:

Inventors
Charles L. Burdick
William B. Makins

By James L. Norris
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES LAURENCE BURDICK, OF WOOD GREEN, LONDON, AND WILLIAM BRAND MAKINS, OF HAMPSTEAD, LONDON, ENGLAND.

MACHINE FOR COATING SURFACES WITH LIQUIDS.

1,294,765. Specification of Letters Patent. Patented Feb. 18, 1919.

Application filed March 4, 1918. Serial No. 220,315.

To all whom it may concern:

Be it known that we, CHARLES LAURENCE BURDICK, a citizen of the United States, residing at Wood Green, in the county of London, England, and WILLIAM BRAND MAKINS, a subject of the King of Great Britain, residing at Hampstead, in the county of London, England, have invented a new and useful Improvement in Machines for Coating Surfaces With Liquids, of which the following is a specification.

This invention relates to a machine for coating surfaces with paints, varnishes or like liquids, and more especially with liquids which are affected by the atmospheric conditions under which they are applied to these surfaces, or which contain volatile constituents or solvents emitting fumes or vapors which are deleterious to health, inflammable or otherwise of a noxious or dangerous character.

For example, the textile fabric used in aeroplane construction, after it has been secured in position on the frame work or parts of the aeroplane, is treated with a liquid coating material known as dope, and it has been found that it is advantageous to apply this dope in an atmosphere the temperature of which is somewhat higher than the normal atmospheric temperature in temperate climates. This dope also contains volatile constituents the fumes from which cause inconvenience to persons breathing the same.

According to this invention, in order to avoid the inconveniences arising from the application of such coating materials by hand in an open atmosphere, these materials are applied by means of spraying nozzles arranged to travel within a closed box or casing, and means operated from outside this box or casing are provided for moving the spraying devices and putting them into and out of operation. Thus the temperature or other atmospheric condition maintained in the box or casing does not cause any inconvenience to persons controlling the operations taking place therein and any fumes or vapors emitted by the liquid distributed by the spraying devices can be drawn off and conducted away.

In the accompanying drawing:—

Figure 1 is a side elevation, and

Fig. 2 a plan of mechanism embodying the invention, with parts removed.

Figs. 3 and 4 are detail views illustrating modified arrangements hereinafter referred to.

As shown 1 is a closed box or casing to which air is admitted through an aperture 2 which may be closed by a sliding door 3. The entering air passes through a heating or cooling coil 4 and is drawn out of the casing 1 through an aperture or conduit 5. A door 6 is provided in one side of the box or casing 1 to permit a carriage 7 to be moved into and out of the casing and a similar door may be provided in the opposite side of the box. This carriage carries a table 8 which can be raised or lowered on standards 9 mounted on the said carriage which is provided with wheels or rollers 10 traveling on rails 11. The door 6 when open, may be used as a bridge to support other rails placed so as to form continuations of the rails 11 whereby the carriage 7 can be easily drawn out of or pushed inside the casing.

Beneath the carriage 7 there is a lever 12 having a pivot pin 13 slidable along a slot 14, and a stud 15 guided in a groove. When the stud 15 is in the part 16 of this groove the carriage 7 can be pushed into the casing in the direction indicated by the arrow 17 until a pin 18 on the carriage is stopped by the lever 12. By then moving this lever in the direction of its length, its forked end engages the pin 18 in such a manner that the carriage can be moved thereby through a short distance to and fro, the stud 15 moving in the part 19 of the groove. The carriage can be stopped in a predetermined position by locking the lever to a bar 20, for example by means of a pin passed through a hole in the lever and entering one of a series of holes in the said bar, or if preferred, notches may be formed in the bar to receive a spring locking bolt.

The stud 15 can be moved along a part 21 of the groove to allow the carriage to pass out at the side opposite to that at which it entered the casing.

The spraying devices 22, which are of well known construction, are carried on a bar 23 mounted at its ends on carriages 24 movable between rails 25 by means of chains 26 and sprocket wheels 27 actuated by a handle 28. Thus the spraying devices can be traversed to and fro above the table 8,

Each spraying device is provided with a lever 29 pivoted at 30 to the bar 23 and in contact with adjustment nuts 29[a] on the spindles of the air and liquid valves of the spraying device. The lever 29 is operated by a pin 31 on a lever 32 pivoted at 33 and having a roller 34 at its opposite end. When the bar 23 is moved from the position in which it is shown in Fig. 1 toward the opposite end of the casing or box 1, the roller 34 engages a cam groove 35 in a block 36 carried by a bracket 37, whereby the lever 32 is moved so that the pin 31 raises and supports the lever 29. The air and liquid valves of the corresponding spraying device are then open.

On the return movement of the bar 23 from the center of the casing 1 past the block 36, the lever 32 is moved so that the pin 31 is carried away from beneath the lever 29 which is curved at 38 to insure a quick opening or closing of the valves.

Blocks 36 are provided near each end of the path of travel of each spraying device or at intermediate points if necessary, and the brackets 37 are made of various lengths to start and stop the action of the corresponding spraying devices respectively as they arrive at suitable positions, in accordance with the contour of the object or objects to be coated arranged on the table 8.

Instead of straight rails 25 as shown in Fig. 1, curved rails 25[a] as shown in Fig. 3 may be provided to cause the nozzles of the spraying devices to move at a uniform distance from the surface of an object to be coated which is curved or sloped in the direction of travel of the bar 23.

A number of spraying devices 22 are carried on the said bar spaced apart at such distances that the spray from one device does not harmfully interfere with the spray from the adjacent devices but this does not preclude an arrangement of the spraying devices in such a manner that the bands of coating material deposited by adjacent spraying devices overlap one another more or less.

The spraying devices may be fitted with nozzles 39 of various lengths as shown in Fig. 4 to efficiently coat objects having corrugations, grooves or like depression or protuberances extending in the direction of travel of the bar 23.

The casing 1 is fitted with windows 40 to allow inspection of the operations taking place inside the casing.

In some instances it is desirable to employ a wiper or the like having a brush-like or squeegee action, traveling with the bar 23 behind the spraying devices. This is especially suitable for use when applying a first coating to textile fabrics to lay the nap smoothly and prevent the formation of nodules. For this purpose a rocking frame 41 is mounted on the bar 23. This frame carries wipers 42 and is provided with rollers 44 resting on the chains 26. The rollers 44 on the leading side of the bar, by reason of the tightening of the chain on that side, are raised and lift the wipers on the same side, *i. e.*, in front of the spraying devices, while the wipers on the opposite side of the bar behind the spraying devices, are lowered into contact with the object which it being coated. A certain amount of slackness of the chain is provided for in order to allow this method of moving the rocking frame to be effective.

The spraying devices 22 are supplied with air and liquid by flexible pipes 45 and bars 46 carried by the chains 26, are provided to support these pipes which are drawn up out of a space 47 as the bar 23 travels in one direction and fall back into this space as the bar travels in the opposite direction. If necessary the lower or slack lengths of the chains may be carried around below the rails 11 to take the bars 46 out of the way of the wipers 42.

When two or more coatings are to be applied to one object, it is preferable that a succeeding band of coating material from any one spraying device shall not be deposited exactly above the previous band of coating material deposited by the same spraying device, and the necessary displacement for this purpose can most conveniently be effected by moving the carriage 7 by means of the lever 12 above described.

What we claim is:—

1. A machine for coating surfaces with liquids, comprising a closed casing, a spraying device within the said casing, and mechanism for imparting movement to the said spraying device.

2. A machine for coating surfaces with liquids, comprising a closed casing, a spraying device within the said casing, mechanism for imparting movement to the said spraying device, and means outside the casing for actuating the said mechanism.

3. A machine for coating surfaces with liquids, comprising a closed casing, a table supporting the object to be coated, a spraying device within the casing, and mechanism for imparting movement to the said spraying device.

4. A machine for coating surfaces with liquids, comprising a table for supporting the object to be coated, a spraying device, mechanism for moving the said spraying device to and fro along a path above the table, and mechanism for moving the table to and fro along a path transversely to the first mentioned path.

5. A machine for coating surfaces with liquid, comprising a closed casing, a table for supporting the object to be coated and a spraying device inclosed within the said

casing, mechanism within the casing for separately moving the said table and spraying device, and means outside the casing for actuating the said mechanism.

6. A machine for coating surfaces with liquids, comprising a closed casing, a table for supporting the object to be coated and a spraying device inclosed within the said casing, mechanism within the casing for separately moving the said table and spraying device, means outside the casing for actuating the said mechanism, a door admitting air to the casing, and a conduit for conducting away air and fumes from the interior of the casing.

7. A machine for coating surfaces with liquids, comprising a table for supporting the object to be coated, a spraying device, a bar supporting the spraying device above the table, and mechanism for moving the table rectilinearly beneath the said spraying device.

8. A machine for coating surfaces with liquids, comprising a table for supporting the object to be coated, a bar, a spraying device carried on the bar, a casing inclosing the table, spraying device and bar, and mechanism operated from outside the casing for moving the table step by step along a fixed path.

9. A machine for coating surfaces with liquids, comprising a table supporting the object to be coated, a spraying device, a bar supporting the spraying device above the table, mechanism for successively moving the table into predetermined positions beneath the said spraying device, and means for locking the table in each position into which it has thus been moved.

10. A machine for coating surfaces with liquids, comprising a table for supporting the object to be coated, a spraying device, a bar carrying the said spraying device and movable to and fro along the table out of contact therewith, and means for starting and stopping the issue of spray from the said spraying device as the bar in its movement passes predetermined positions.

11. A machine for coating surfaces with liquids, comprising a table for supporting the object to be coated, a spraying device, a lever movable to one position to start the issue of spray from the spraying device and movable to another position to stop the issue of spray, a bar carrying the said spraying device and movable to and fro along the said table out of contact therewith, and a fixed cam for moving the said lever to start the issue of spray as the lever is carried past the cam in one direction and to stop the issue of spray as the lever is carried past the cam in the opposite direction by the movement of the said bar.

12. A machine for coating surfaces with liquids, comprising a table supporting the object to be coated, a spraying device movable to and fro along the table out of contact therewith, a device for starting and stopping the issue of spray from the said spraying device as it moves past predetermined positions, a casing inclosing the said table and spraying device, a door admitting air to the said casing and a conduit for conducting away air and fumes from the interior of the casing.

13. A machine for coating surfaces with liquids, comprising a table supporting the object to be coated, a spraying device movable to and fro along the said table out of contact therewith, a device for starting and stopping the issue of spray from the said spraying device as it moves past predetermined positions, a casing inclosing the said table and spraying device, a door admitting air to the said casing, a temperature regulating coil arranged in the said casing near the said door, and a conduit for conducting away air and fumes from the interior of the casing.

14. A machine for coating surfaces with liquids, comprising a table for supporting the object to be coated, a spraying device, a bar carrying the said spraying device, rails guiding the ends of the said bar, a chain attached at its ends to the said bar, sprocket wheels supporting the chain, and means for rotating the sprocket wheels to move the said bar to and fro along the said rails.

15. A machine for coating surfaces with liquids, comprising a spraying device, means for moving the said spraying device along an object to be coated out of contact therewith, and a wiper following the spraying device and in contact with the said object.

16. A machine for coating surfaces with liquids, comprising a spraying device, means for moving the spraying device to and fro along an object to be coated out of contact therewith, a rocking frame carrying wipers respectively arranged in front of and behind the said spraying device and means for rocking said frame to raise the wiper which is in front of and lower into contact with the object to be coated the wiper which is behind the said spraying device, in accordance with its direction of motion.

17. A machine for coating surfaces with liquids, comprising a spraying device, a bar movable on rails and carrying the said spraying device, an endless chain connected to the bar and operated by means of sprocket wheels to move the bar in opposite directions, a rocking frame, a roller carried by the said frame and resting on the said chain on one side of the bar, a second roller carried by the frame and resting on the chain on the other side of the

bar and wipers carried by the frame on opposite sides of the bar respectively corresponding to each roller.

18. A machine for coating surfaces with liquids, comprising a spraying device, a bar carrying the said spraying device, a chain passing around sprocket wheels and connected at its ends to the bar, flexible pipes supplying air and liquid to the spraying device and means carried by the chain for supporting the said pipes following the movement of the spraying device.

19. A machine for coating surfaces with liquids, comprising a spraying device, a fixed track therefor, means for moving the said spraying device to and fro along the said track, a table, and a carriage supporting the said table and movable in a direction transverse to the direction of motion of the spraying device.

20. A machine for coating surfaces with liquids, comprising a spraying device, a fixed track therefor, means for moving the said spraying device to and fro along the said track, a table, a carriage supporting the said table and movable in a direction transverse to the direction of motion of the spraying device, and means for moving this carriage and stopping it in predetermined positions.

21. A machine for coating surfaces with liquids, comprising a spraying device, a fixed track therefor, means for moving the said spraying device to and fro along the said track, a table, standards supporting the said table and allowing its position to be adjusted toward or away from the said spraying device, a carriage on which the said standards are mounted, and a track along which the said carriage can be moved transversely to the track of the spraying device.

CHARLES LAURENCE BURDICK.
WILLIAM BRAND MAKINS.

Witnesses:
HERBERT A. BEESTON,
JOHN T. KNOWLES.