F. DYKES & D. E. WELLS.

PNEUMATIC POWER PAINTING MACHINE.

APPLICATION FILED SEPT. 21, 1911.

1,034,988. Patented Aug. 6, 1912.

2 SHEETS—SHEET 1.

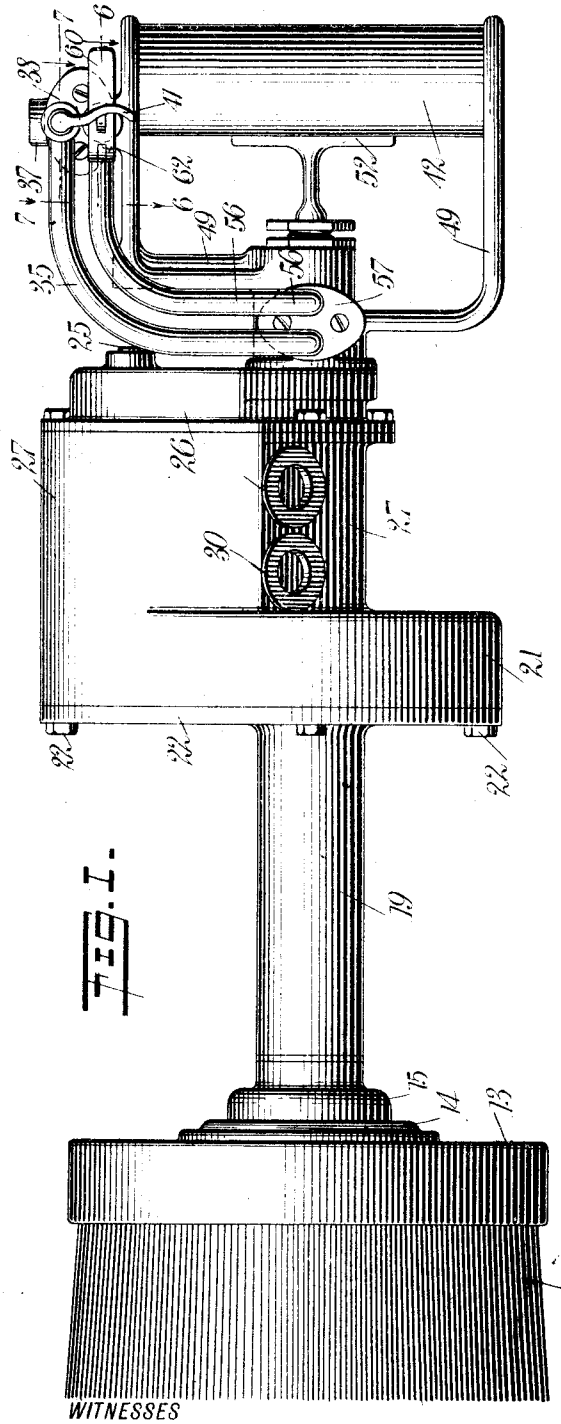

FIG. 1.

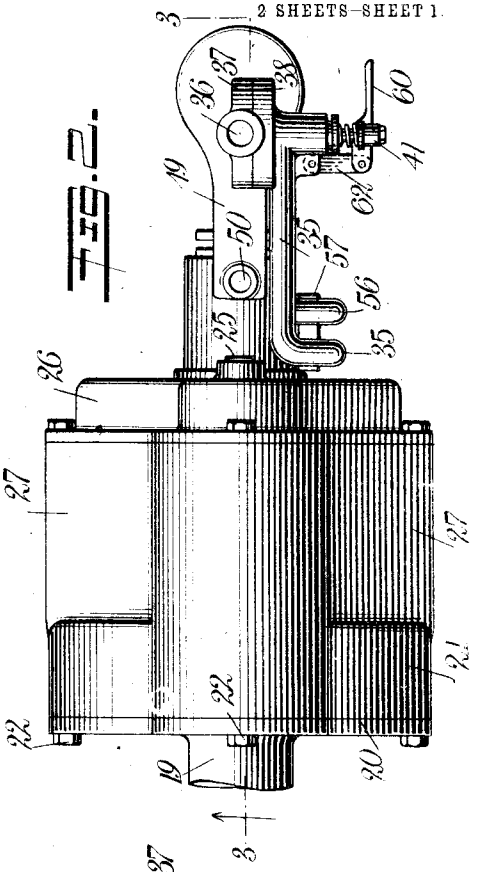

FIG. 2.

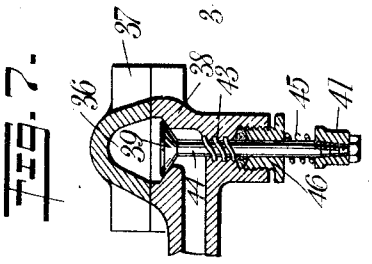

FIG. 7.

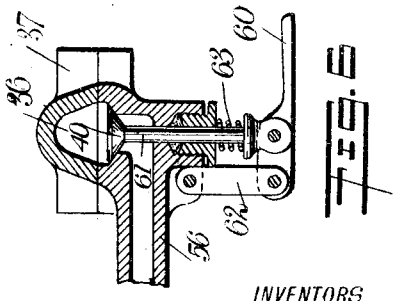

FIG. 6.

WITNESSES

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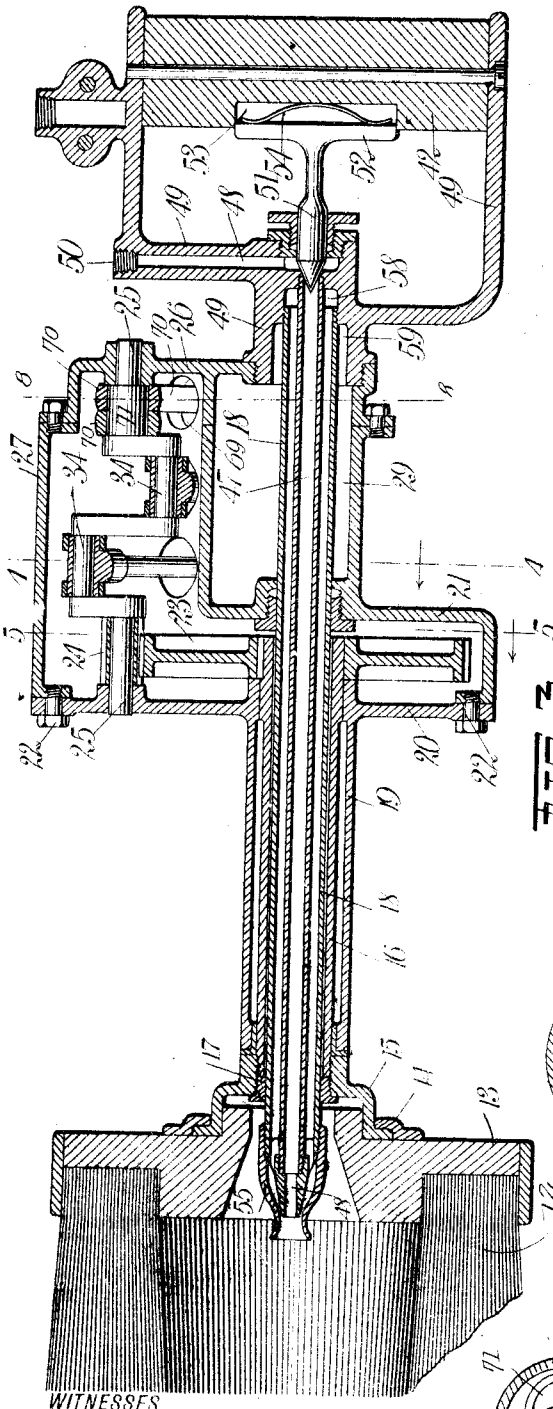


FIG. 3.

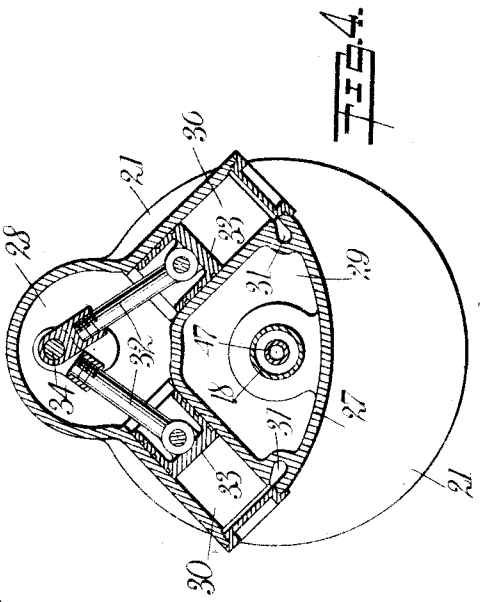


FIG. 4.

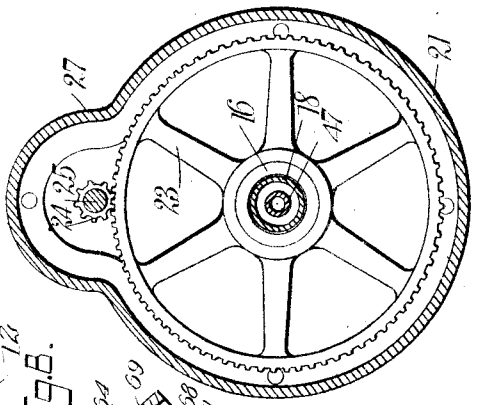
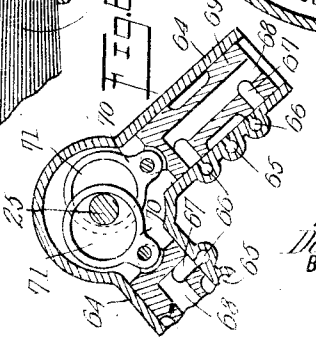


FIG. 5.



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UNITED STATES PATENT OFFICE.

FRANCIS DYKES, OF ELIZABETH, NEW JERSEY, AND DAVID E. WELLS, OF NEW YORK, N. Y.; SAID WELLS ASSIGNOR TO SAID DYKES.

PNEUMATIC-POWER PAINTING-MACHINE.

1,034,988. Specification of Letters Patent. Patented Aug. 6, 1912.

Application filed September 21, 1911. Serial No. 650,491.

To all whom it may concern:

Be it known that we, FRANCIS DYKES, a subject of the King of Great Britain, and a resident of Elizabeth, in the county of Union and State of New Jersey, and DAVID E. WELLS, a citizen of the United States, and a resident of the city of New York, West New Brighton, borough of Richmond, in the county of Richmond and State of New York, have invented a new and Improved Pneumatic-Power Painting-Machine, of which the following is a full, clear, and exact description.

Among the principal objects for which the present invention is produced are: To provide a hand-guided, power-rotated brush to deliver and spread paint upon a prepared surface; to provide for a brush of the character mentioned manually operated means for controlling the supply of paint; to provide means for spreading the paint in the delivery thereof to the surface, to avoid lumping or streaking of the finished product; and to provide controlling devices for the brush, whereby the quantity of paint and the spread thereof may be manually controlled.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a side view of a machine constructed and arranged in accordance with the present invention; Fig. 2 is a plan view of the motor casing and handle of the machine; Fig. 3 is a longitudinal section taken on the line 3—3 in Fig. 2; Fig. 4 is a vertical cross section taken on the line 4—4 in Fig. 3; Fig. 5 is a vertical cross section taken on the line 5—5 of Fig. 3; Fig. 6 is a cross section taken on the line 6—6 of Fig. 1; Fig. 7 is a cross section taken on the line 7—7 of Fig. 1, and Fig. 8 is a cross section taken on the line 8—8 in Fig. 3.

As seen in the accompanying drawings, the brush employed herein consists of a ring of bristles 12. The bristles are rigidly secured in a rotary head or block 13. The block 13 is provided with a clamping flange 14, by which it is secured to the ring 15. The ring 15 is screwed upon the tube 16 and held there by a lock-nut 17. The nut 17 forms a bearing for the pipe 18, which is non-rotatably mounted within the tube 16. The tube 16 is further supported in its rotation by a tubular casing 19. The casing 19 is provided with a bolting flange 20, which forms the cover for a gear case 21, to which it is secured by means of bolts 22. The flange 20 is centrally bored to form a bearing for the tube 16 adjacent where the said tube is provided with a gear wheel 23. The wheel 23 is meshed with a pinion 24 fixedly mounted on the crank shaft 25 of the motor. The crank shaft 25 is supported in bearings formed in the flange 20 and in the head 26 closing the motor case 27. In the present construction, the motor case 27 is provided with a crank chamber 28 and a pressure chamber 29, intermediate which are cylinders 30, 30. The cylinders 30, as is usual in engines of this character, are supplied by inlet ports 31 opening from the said cylinders into the pressure chamber 29.

The engine shown in the present disclosure is provided with duplicate paired piston rods 32, which are connected with pistons 33, 33. The rods 32 are connected with separate crank pins 34, 34. This construction of engine results in forming a steady-running and well-balanced motor for the painting machine.

Compressed air is furnished to the chamber 29 through a flexible conduit 35 connecting said chamber with a channel 36 formed in the upper part of the head 37, the compressed air being taken from any suitable supply. As seen best in Fig. 7 of the drawings, the channel 36 is open, to register with a channel formed in a cap 38. The cap 38 is bolted to the flange of the head 37, and is provided with valve seats, the upper one being provided to receive a valve 39, and the lower, a valve 40 (see Fig. 6 of the drawings). The valve 39 is operated by a thumb lever 41, which, being adjacent to the machine handle 42, permits the operator to throw said lever 41 in a manner to unseat the valve 39. The seating of the valve 39 is controlled by the screw thread 43 formed on the stem 44 of the valve 39. To steady the action of the stem and screw, we provide a compression spring 45 to hold the stem from turning. The perforation through which the stem 44 is passed is packed by means of a gland.

When operating the machine, the mechanic, grasping with the one hand the han-

dle 42, and with the other the casing 19, guides the brush or the bristles 12 over the surface as desired. During this movement of the bristles, by throwing the lever 41 with the thumb of the hand holding the handle 42, the compressed air is delivered into the chamber 29, and from thence passes through the cylinders 30, 30, to rotate the shaft 25 and the pinion 24 mounted thereon. The rotation of the pinion 24 transmits through the wheel 23 the desired revolutions to the tube 16 and the head 13 of the said brush. The rate of speed of rotation is governed largely by the amount of air admitted through the valve 39, the opening of which may be at all times varied by the movement of the lever 41.

During the rotation and movement of the brush 12, the paint is delivered within the circle of the bristles 12, being carried by a delivery pipe 47 and a nozzle 48. At the opposite end or end adjacent the handle 42, the pipe 47 is normally in open communication with a passage 48 formed in the bail 49 of the handle 42. The passage 48 is disposed perpendicular to the pipe 47, and is provided at the upper end with a screw-threaded opening 50 to receive the delivery pipe of a paint reservoir.

To control the communication from the passage 48 to the pipe 47, we provide a plunger 51. The end of the plunger 51 is coned to form a valve for closing the communication between the said passage and the said pipe. At the outer end of the plunger 51, a head 52 is formed and guidedly mounted within a recess 52. Seated within the recess 53 is a flat leaf spring 54, the normal operation of which is to seat the coned end of the plunger 51 to close the pipe 47 and to cut off the supply of paint therethrough.

As will be noted, the fingers of the operator close over the head 52, and compress at will, strongly or lightly thereon, to regulate the seating of the valve or coned end of the plunger 51. The supply of paint to the pipe 47 is thereby controlled.

To induce the flow of paint through the pipe 47, we provide a passage through the pipe 18. At the lower end of the pipe 18, the same is furnished with a nozzle 55. The shape of the nozzle 55 is such as to infold the nozzle 48, and in conjunction therewith form a constricted annular passage surrounding the end of the nozzle 48 and directing the air as delivered from the nozzle 55, across the opening of the nozzle 48, as in the pulsometer. This action creates a rarefaction at the end of the nozzle 48 and the pipe 47, which draws paint and accelerates the movement of the paint through the pipe 47. As the paint is thus delivered, it is atomized or comminuted and thrust as a spray on the surface within the circle of the ring of bristles 12. This operation, as will be seen, preliminarily sprays the paint upon the surface evenly and with sufficient force to induce the penetration of the paint into the hollow or pitted areas of the said surface. The movement of the bristles over the paint thus delivered spreads or grains the same.

The compressed air which is delivered to the pipe 18 is conveyed from the channel 36 through the conduit 56 when the valve 40 is lifted from its seat. Openings are formed in the plate 57, to which the conduits 35 and 56 are secured, the one opening leading to a chamber 58, and the other to a chamber 59 formed in the bail 49, as seen best in Fig. 3 of the drawings. The chamber 58 is in open comunication with the pipe 18 and closed from the chamber 59, and the chamber 59 is in open communication with the chamber 29.

The operation of the valve 40 is controlled by a lever 60. The lever 60, as best seen in Fig. 6 of the drawings, is pivotally connected with a valve stem 61, and is pivotally mounted by means of a link 62. The valve 40, as shown, is normally seated by a spring 63.

By reference to the drawings, and particularly to Fig. 1, it will be seen that the mechanic grasping the handle 42 naturally places the thumb on the handle over the lever 60, while the fingers extend over the head 52. Thus conveniently he has under control the supply of paint and the supply of air. Also, due to the adjacency of the lever 41 to the thumb of the operator, he has control of the compressed air for operating the engine rotating the brush, thus completing the control of the operator over the machine described.

The cylinders 30, 30 are each provided with a juxtaposed valve casing 64. The casings 64 are suitably provided each with an exhaust passage 65 and inlet passages 66. The inlet passages 66 are arranged to register with ports 67 extending from a central bore 68 in each of the valves 69. Each of the valves 69 is pivotally connected with a short coupling rod 70, each constructed to infold an eccentric 71 mounted on the crank shaft 25. The motors are arranged with reference to the valves 69 and eccentrics 71 thereof, so that when one of the pistons 33 arrives at the outer end of its return stroke, a corresponding port 66 is open, to deliver air through the port 31 into the cylinder 30. As will be seen by reference to Fig. 8, there are provided two ports 66 in each of the casings 64. By reference to Fig. 3, it will be seen that two crank pins 34 and cranks therefor are mounted on the shaft 25. By reference to Fig. 4, it will be seen that each of the crank pins is connected to two alined pistons. In other words, the two valves shown in Fig. 8 supply four cylinders 30,

[illegible] mechanism between said hand [illegible] said brush for rotating said brush; a [illegible] delivery [illegible] disposed within said handle, [illegible] compressed-air system for [illegible] and delivering the paint within [illegible] of said brush; a hand-hold for said [illegible]; and a valve mounted on said hand-[illegible] to limit the sup[illegible] of paint to said brush.

[illegible] In a painting [illegible] of the character [illegible] described, the [illegible] of a pneumatic [illegible] brush, transmission [illegible] connecting said engine and [illegible] compressed-air system for supply[illegible] embodying a delivery [illegible] the tubular ring of [illegible] to deliver paint [illegible] supporting han[illegible] delivery pipe and [illegible] hand-hold; and a [illegible] on said hand[illegible] supply of air to said [illegible] pipe, and for [illegible] delivery [illegible]

[illegible] described, [illegible] handle for [illegible] paint [illegible] brush, [illegible] control[illegible] [illegible] signed our [illegible] presence of [illegible]

[illegible] DYKES.
[illegible] WELLS.

Witnesses:
[illegible]
[illegible]