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1,709,064

VAPORIZING NOZZLE FOR HUMIDIFYING APPARATUS

Filed Aug. 13, 1926

Fig. 1.

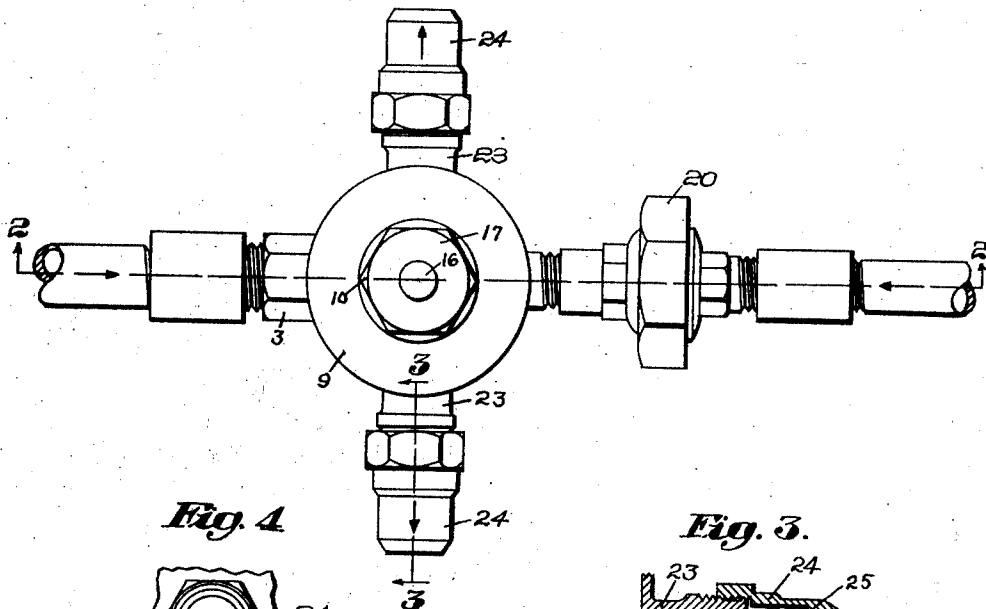


Fig. 4.

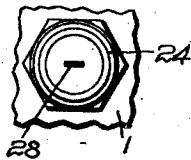


Fig. 3.

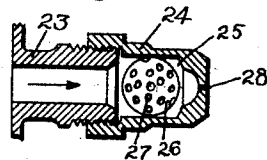


Fig. 2.

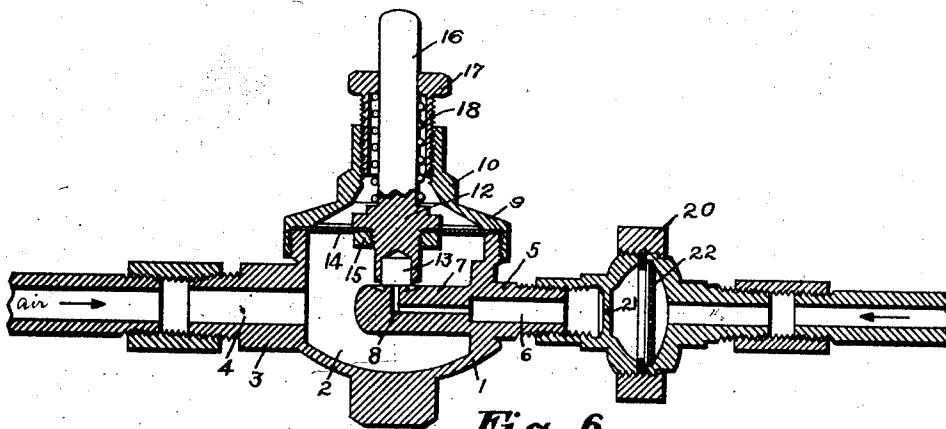


Fig. 6.

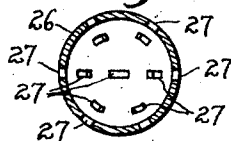
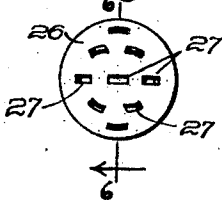


Fig. 5.



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VAPORIZING NOZZLE FOR HUMIDIFYING APPARATUS.

Application filed August 13, 1926. Serial No. 129,068.

This invention relates to humidifying apparatus for general use, and particularly for textile mills, and its object is to provide an improved construction of spray nozzle having, among others, the advantages hereinafter pointed out.

In the drawings of one embodiment of my invention selected for illustration and description,

Fig. 1 is a plan view of the novel mixing and vaporizing nozzle used in conjunction with humidifying apparatus similar to that disclosed in my Letters Patent No. 1,553,370.

Fig. 2 a vertical section on the line 2—2, Fig. 1, also partly broken away;

Fig. 3 a vertical section detail of the spraying nozzle on the line 3—3, Fig. 1, on a larger scale;

Fig. 4 an end view of the nozzle; and

Fig. 5 a side view of a modified form of the vaporizing member.

Fig. 6 is a section of the hollow ball vaporizing member taken on line 6—6 of Fig. 5.

With reference first to Figs 1 and 2, my invention comprises a spray nozzle for use in humidifying apparatus including a water control valve much like that shown in my Letters Patent No. 1,553,370, issued September 15, 1925. Such valve comprises the body 1 with a mixing and pressure chamber 2, the body having a threaded nipple 3 providing an air passage 4 at one point, and a nipple 5 with a water passage 6 at another point on its side. The nipple 5 is extended within the chamber to a substantially central point by means of a neck 7, and provides a water admission port 8.

The body 1, Fig. 2, is provided with a cover 9 which has a threaded or other suitable connection with the body and the cover is provided also with an upwardly extended neck 10 interiorly threaded. The valve comprises also a head 12 which seats on the port 8 and is preferably provided with a rubber or other cushion member 13 as a contact member therefor. This head 12 carries a diaphragm 14 of metal or other suitable material and it is secured to the head by a threaded nut 15.

The diaphragm is locked tightly between the body 1 and the cover by the latter.

The head has the stem 16 which extends upwardly through an inverted cup-like spring housing or bushing member 17 having a threaded engagement with the neck 10 for the purpose of effecting and adjusting the

compression of the spring 18 within the housing 17, which spring seats at one end against the housing and at its opposite end on the valve head 12, by means of which construction the desired pressure is always maintained upon the head and diaphragm to control and time its action.

The union 20, Fig. 2; in the water line is provided with a water aperture 21 of small area and a screen 22 to protect the same from dirt or other foreign matter that may find its way thereto in the water or other liquid.

The body 1, Figs. 1, 3, is also provided at suitable points with a plurality, herein two, of nozzles or spraying heads of novel design. Upon a nipple 23, Fig. 1, on the body 1, is threaded, Fig. 3, a novel nozzle 24 of elongated, cup-shape form, having a chamber 25 to receive a hollow air and liquid mixing ball 26 of suitable material, as metal.

I have found by careful experiments and tests that such a mixing member is unusually efficient. The hollow ball is provided with a plurality of small apertures 27 leading to its interior which act to supervaporize or vaporize to an extreme degree the air and liquid vapor coming through the ball from the mixing chamber 2 and to sub-divide and re-mix and further vaporize the vapor stream to an unusual degree. In addition to the function of dividing the air and water or other liquid stream coming from the chamber 2 into a large number of small streams, the ball is kept in motion by the force of the water and air stream and consequently, the direction and continuity of the incoming stream are constantly changed and broken up with most satisfactory results. Furthermore, the nozzle is provided with a rectangular slot or water exit 28, which also aids in spreading the water and air column laterally over a large area as it leaves the nozzle.

In Fig. 5 is shown a modified form of vaporizing ball member 26 wherein the apertures 27 are rectangular instead of round. I have found that such openings in the ball are more effective and, so far as I have been able to determine at this time, have the same apparent advantage over round openings that such an opening in the nozzle 24 has over round ones in the nozzle.

The operation of my apparatus will doubtless be clear from the foregoing description of it. The diaphragm 14 of the valve 12 is adjusted by means of the spring 18 to resist

the ordinary amount of water pressure supplied, and to yield to that pressure when combined with a predetermined air pressure through the passage 4 which the particular conditions require. After water has been admitted to the chamber 2 by the passage 6, air of suitable pressure is admitted through the passage 4, and thereafter the head remains raised so long as the air pressure is supplied. The air and water are thoroughly mixed in the chamber 2 and flow through the nozzles 23 by which the mixed air and water stream is laterally spread over considerable area.

The expense of creating and maintaining air pressure is very considerable and any construction that will decrease the amount of air required is of great financial as well as practical value.

I have found that, with this construction, particularly with my novel spray nozzle I can, with from ten to fifteen pounds of air pressure, vaporize from one third to one half more water in volume at from twelve to eighty pounds pressure according to what is available, than by any other construction of which I have knowledge.

With this construction also, I find that the tendency of water to drip from the nozzle after the water has been shut off, does not exist.

My invention is not limited to the precise embodiment thereof herein described and illustrated.

Claims.

1. In humidifying apparatus, a spray nozzle having a perforated freely movable ball liquid vaporizer therein.

2. In humidifying apparatus a spray nozzle having a hollow freely movable ball liquid vaporizer and stream divider therein with rectangular openings therethrough.

3. In humidifying apparatus a spray nozzle having therein a ball with a plurality of radially extended vaporizing passages there-through.

4. In humidifying apparatus a spray nozzle having therein a hollow perforated spherical movable vapor stream divider and direction changer.

In testimony whereof, I have signed my name to this specification.

GEORGE W. D'ARCY.