June 28, 1955 C. ALLANDER 2,711,926

APPARATUS FOR ATOMIZING AND SPRAYING LIQUIDS

Filed July 21, 1953

FIG. 1.

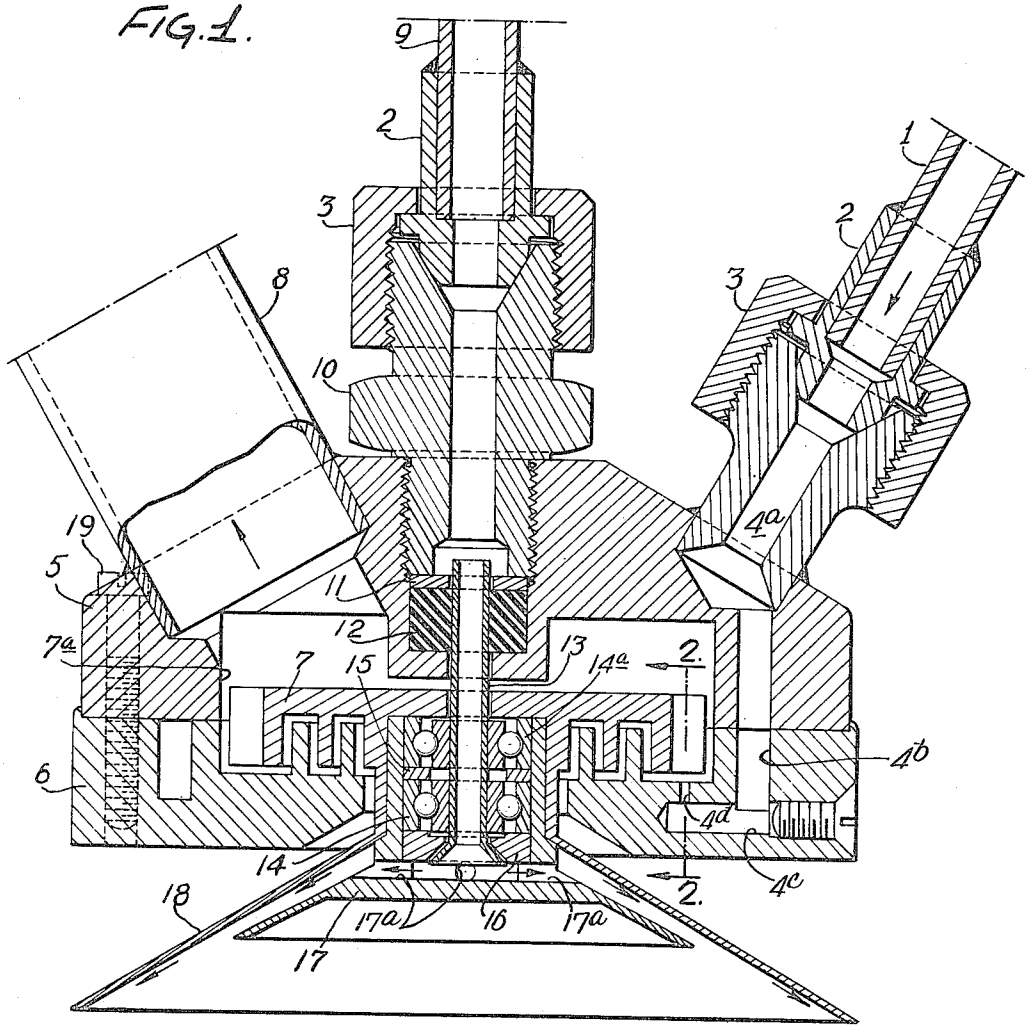
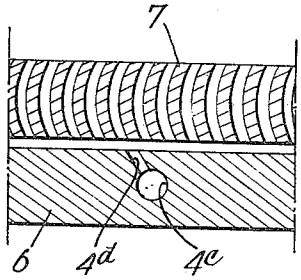


FIG. 2.



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APPARATUS FOR ATOMIZING AND SPRAYING LIQUIDS

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3 Claims. (Cl. 299—63)

The present invention relates to an apparatus for atomizing and spraying liquids by means of a rotatable disk, supported in a sprayer body at the foremost part of a supply pipe for the liquid. In textile manufacturing plants and similar factories it is often necessary to increase the humidity of the air in order to increase the strength of the textile fabrics. For this purpose it is prior known to distribute and spray water at different points in the space to be humidified by means of ejector shaped nozzles connected to a compressed air plant, thus increasing the humidity of the air. The required pressure air is commonly delivered by a number of duct lines from a compressed air tank. Such a method to distribute water has however certain disadvantages, in that drops of oil from the compressor plant are transported by the compressed air and are splashed and sprayed out in the factory. There is a risk for spoiling ready textile stuffs by such splash-oil. It is an object for the invention to eliminate this disadvantage.

According to the invention the driving means of the disk for the atomizing and spraying the liquid consists of a rotor wheel provided with blades and enclosed in a casing, the driving medium for the wheel being pressure air supplied and discharged through separate pipes. According to a modification the casing for the driving means consists of a cavity in the sprayer body to which body pipes are connected for the supply and discharge of the driving medium for the wheel and provided with a supply pipe in the centre of the sprayer body for the supply of liquid. According to a still further modification the disk consists of a truncated cone, said cone being supported by means of a roller bearing on the liquid supply pipe at the foremost part of the sprayer body and being provided with a conical hub plate in which a number of ducts are arranged extending from the top of the cone for the centrifuging of liquid during the rotation of the disk.

The invention will now be more closely described in connection with the accompanying drawing, which shows a preferred embodiment of the apparatus according to the invention and in which

Fig. 1 is a vertical section of the sprayer body, the disk and the pipes for the supply and discharge of pressure air and also a supply pipe for the liquid.

Fig. 2 is a part of the apparatus along the line II—II in Fig. 1.

The supply pipe for the liquid, usually water is designated **9** and the spraying disk is designated **18**. **17** is a hub plate and **17***a* designates a chanel for the liquid. There are suitable four such channels arranged around the periphery of the spraying disk. The spraying disk is supported by means of roller bearing **14** at the foremost part of the liquid supply pipe. **16** is a sealing washer. Adjacent to the foremost end of the liquid supply pipe a turbine wheel **7** is supported in a cavity **7***a* of the sprayer body. The bearing for the turbine wheel is designated **14***a*. Between the roller bearing **14** and the roller bearing **14***a* a washer **15** is arranged. **11** designates a washer and **12** is an arrangement for dampering vibratory motions in the axle **13**. The sprayer body consists of two parts **5** and **6**, respectively which are joined together by means of a number of screws **19** evenly distributed around the periphery of the sprayer body. The designations **2**, **3** and **10** stand for different parts for mechanical fastening of the liquid supply pipe and liquid sealing means for same. **1** is a pipe for the supply of compressed air which is forced to pass through the space **4***a* and the channel **4***b*, **4***c* and **4***d* to the turbine wheel **7**. **8** designates a duct for the discharge of used compressed air from the space **7***a*.

The function of the apparatus is as follows. Compressed air is delivered to the turbine wheel **7** through the passage **1**, **4***a*, **4***b*, **4***c* and **4***d* (see Fig. 2). The rate of rotation of the turbine wheel is about 30,000 rotations per minute or even more. The compressed air is then discharged through the pipe **8** for the recirculating of air to the compressed air plant. The spraying disk **18** is mechanically joined with the turbine wheel and has a corresponding speed of rotation. The liquid being supplied through the pipe **9** is discharged through the channels **17***a* with great force and is atomized and is spread along the outer edge of the disk **18**. The channels **17***a* will have a suction action on the liquid at the foremost end of the liquid supply pipe. This suction action will increase the efficiency of the disk as atomizing and spraying means. The apparatus is so constructed that the vibration damper **12** is the only point which supports the bored axle **13**, in its turn carrying both the turbine wheel and the spraying disk. If this suspension—with respect to the high speed of the rotating disk—would be spoiled in any respect, it would only occur that compressed air would be freely discharged from the space **7***a* without any action on the turbine wheel. There is thus in such a case no risk for a mechanical waste for instance by the fast rotating disk.

What I claim is:

1. In apparatus for atomizing and spraying liquids, a body member having a circular chamber therein, a liquid pipe fixedly mounted in said body and extending coaxially of the chamber therein, means to supply liquid to said pipe, a hub member rotationally journalled on said liquid pipe, a sprayer head carried by said hub member, a turbine wheel mounted on said hub for rotation within said chamber and having a series of blades disposed circumferentially thereabout, means to discharge an impeller fluid under pressure against said blades to rotationally drive the turbine and said sprayer head, a plurality of concentric grooves in the face of the turbine wheel adjacent the sprayer head, an annular end wall on the body member extending intermediate the turbine wheel and sprayer head in circumscribing relation to the hub and having on its inner face a plurality of concentric axially projecting fins arranged with respect to the concentric grooves in the confronting turbine wheel face so that one of said fins is received freely within each of said concentric grooves thereby to provide a labyrinth seal to prevent leakage of the impeller fluid from the body chamber through the hub opening in said annular body end wall, and means for exhausing the spent impeller fluid from the body chamber.

2. Apparatus as claimed in claim 1, wherein the sprayer head is of conical configuration disposed in outwardly divergent relation with respect to the body member.

3. Apparatus as claimed in claim 1, wherein the sprayer head is of conical configuration disposed in outwardly divergent relation with respect to the body member, and a conical shaped member is disposed within the

sprayer head and is provided with a plurality of radially extending channels communicating at their inner ends with the liquid pipe and having their outer ends in confronting relation to the inner wall of said conical sprayer head.

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