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Rindisbacher

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[54] **ATOMIZER FOR SPRAYING A LIQUID MEDIUM**

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[51] **Int. Cl.** **B05b 3/02**, B67d 5/06

[58] **Field of Search** ..... 239/102, 214, 214.25, 225, 239/227, 229, 243, 380, 261, 104, 288, 288.3, DIG. 19; 222/504

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[57] **ABSTRACT**

An atomizer for spraying a liquid medium, having a nozzle body which has connections for the liquid to be sprayed and for compressed air. The nozzle body is mounted for universal movement by means of two rings connected by rotary pins to one another and to the nozzle body. The nozzle is driven in a predetermined path by a guide shaft in cooperation with an eccentrically-mounted follower ring.

7 Claims, 2 Drawing Figures

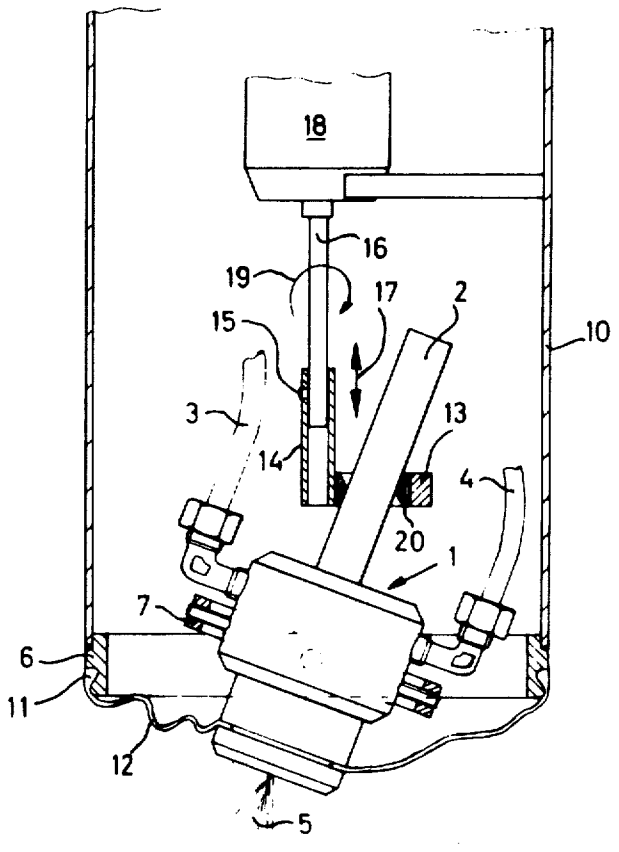

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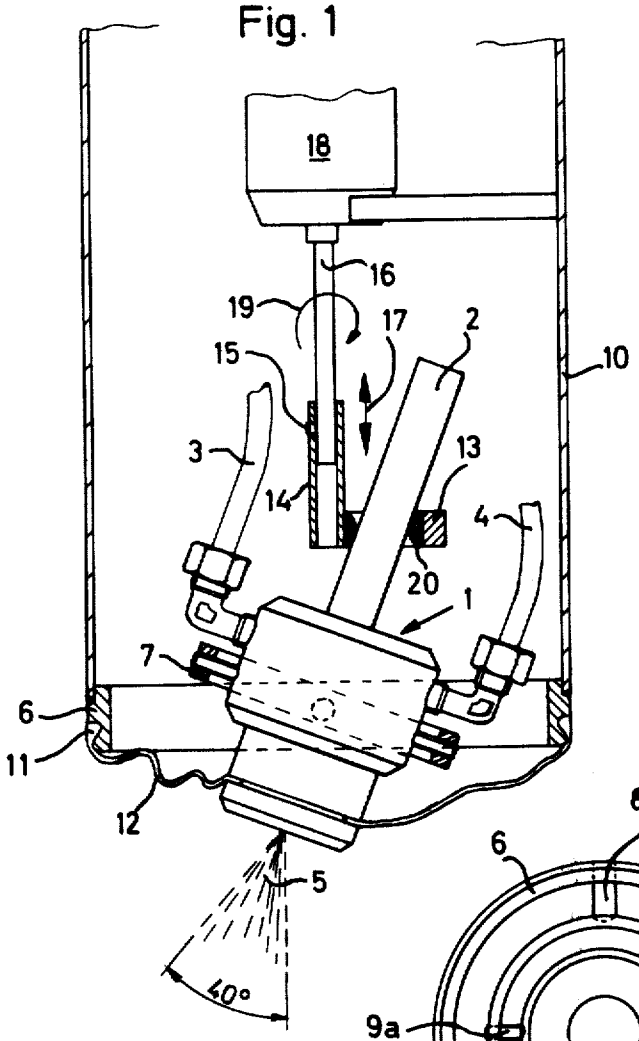
Fig. 1



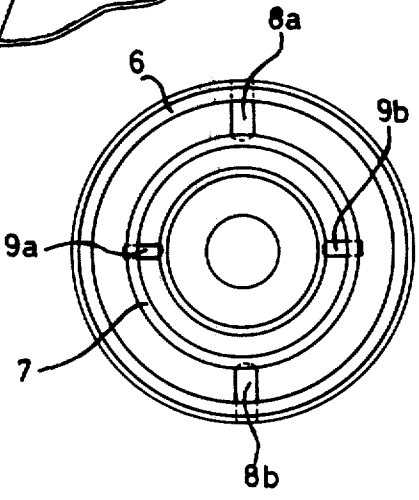


Fig. 2

ATOMIZER FOR SPRAYING A LIQUID MEDIUM

The present invention relates to an atomizer for spraying a liquid medium, of the kind having a nozzle body which has at least a connection for the liquid to be sprayed and a connection for the compressed air.

The known types of atomizer of the kind referred to, which are supplied with a liquid and compressed air and which are widely used in industrial processing engineering, are expected to have an angle of spray preferably as wide as possible. For constructional reasons the angle of spray of the atomizers currently on the market, however, is limited to about 40°, which in many fields of application is insufficient, thereby often making it necessary to use a combination of two or more nozzles. The operating and control cost of these nozzles is relatively high, but so far no simpler and more practical solution has been found.

It is an object of the invention to mitigate this disadvantage.

Accordingly, the invention provides an atomizer for spraying a liquid medium comprising a nozzle body which has at least a connection for the liquid to be sprayed and a connection for compressed air, wherein the nozzle body is mounted for free movement and includes a guide shaft with co-operates with an eccentrically mounted follower connected with a drive whereby the nozzle body may be moved in a predetermined path.

As a result of this arrangement the nozzle is able to spray a large area and can be adjusted at will.

Advantageously the nozzle body is mounted by means of two rings, with a first pair of rotary pins between the two rings which are displaced by 90° relative a second pair of rotary pins connecting the inner ring with the nozzle body, thereby allowing a universal movement of the nozzle body.

However, it is also possible to mount the nozzle body in an elastic holding membrane.

The follower, for example, may include a ring eccentrically secured to a lower end of a drive shaft. This ring is preferably provided on its inner surface with a plastics coating, for example polytetrafluorethylene.

The drive shaft, at its lower end, preferably has a height adjustable adjusting sleeve adapted to slide onto and off of the shaft the same ring being secured thereto.

The attached drawing represents an example of an embodiment of an atomizer according to the invention, in which:

FIG. 1 is a simplified vertical section through an atomizer and

FIG. 2 is a simplified view of the atomizer as seen from below. in

FIG. 1 shows a complete nozzle body **1** to the upper part of which is secured a guide shaft **2.** The nozzle body **1,** the construction of which is well known and is therefore not described in detail, is supplied with liquid via a pipe **3** and with compressed air via a pipe **4.** The liquid and the compressed air are discharged through concentric annular nozzle openings in the lower end of the nozzle body, so that the liquid is dispersed by the compressed air. The angle of spraying of the spray cone of liquid may for example be about 40°in conformity with known spraying nozzles.

The nozzle body **1** is mounted in gimbals formed by two rings **6, 7** which are pivotally connected with each other by means of two pairs of rotary pins **8***a*, **8***b* respectively. The pair of rotary pins **8***a*, **8***b* connecting the

two rings **6, 7** are displaced by 90° relative the pair of rotary pins **9***a*, **9***b* connecting the inner ring **7** with the nozzle body **1.** This type of universal mounting permits the nozzle body to be rotated in any desired direction.

A similar mounting, although not without certain disadvantages, could for example also be achieved by using an elastic, for example rubber, holding membrane, in place of the gimbals. The annular holding membrane would then be secured to the lower end of the supporting tube **10** on the one hand, and to the circumference of the nozzle body **1** on the other.

The ring **11** secured to the supporting tube **10** has at its lower section an annular groove into which extends a head **11** of a safety bellows **12.** The annular bead **11** has a limited initial tension relative the corresponding annular groove of the ring **6** so that it cannot become detached by itself. The object of the safety bellows **12** is to protect the mechanical parts of the nozzle from contact with the liquid to be sprayed.

The guide shaft **2** of the nozzle extends into a catch ring **13,** as shown in FIG. **1,** which is nonrotatably secured to the lower end of an adjusting sleeve **14.** The axis of the catch ring **13** is parallel to but spaced from the axis of the tube **10.** The adjusting sleeve **14** can be displaced or fixed at any desired height in the direction of the arrow **17** on the circumference of a drive shaft **16** by means of an adjusting screw **15.** The shaft **16** is driven by a motor mounted on the supporting tube **10.**

When the drive shaft **16** is rotated in the direction of the arrow **19** the guide shaft **2** of the nozzle is also moved, whereby the nozzle axis moves along the surface of an imaginary double cone and the nozzle jet thus covers a very large area.

By raising the catch ring **13** the effective spraying area may be reduced and by lowering it the same may be increased.

In view of the friction generated at the inner surface of the catch ring **13,** a plastics coating **20** is preferably applied, which may be, for example, of polytetrafluorethylenes or Nylon or a similar plastics composition.

Besides the large adjustable spraying area the arrangement above with reference to the drawings has the advantage that the nozzle body does not rotate about its own axis, thereby eliminating the difficulties in sealing the connecting points of the pipes **3** and **4** encountered with known devices of this kind.

I claim:

1. An atomiser for spraying a liquid medium comprising:

a nozzle body,

connections on the nozzle body for the liquid medium and for compressed air,

mounting means for the nozzle body to permit free movement of the nozzle body,

a guide shaft mounted on the nozzle body,

an eccentrically mounted follower which engages the guide shaft,

drive means for driving the follower whereby the nozzle body is moved in a predetermined path.

2. An atomiser according to claim **1** wherein the mounting means comprise inner and outer concentric rings, a first pair of rotary pins between the two rings, a second pair of rotary pins displaced by 90° relatively to the first pair of rotary pins and connecting the inner ring to the nozzle body whereby the nozzle body moves universally.

3. An atomiser according to claim 1 wherein the mounting means comprise an elastic holding membrane.

4. An atomiser according to claim 1 wherein the drive means include a rotatable drive shaft and wherein the follower includes a ring eccentrically secured to said drive shaft.

5. An atomiser according to claim 4 wherein the ring

has a coating of plastics material.

6. An atomiser according to claim 5 wherein the plastics material is polytetrafluorethylene.

7. An atomiser according to claim 4 wherein a height adjustable adjusting sleeve is mounted at the end of the drive shaft for axial sliding movement therealong and wherein the ring is connected to said sleeve.

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