

June 17, 1930.

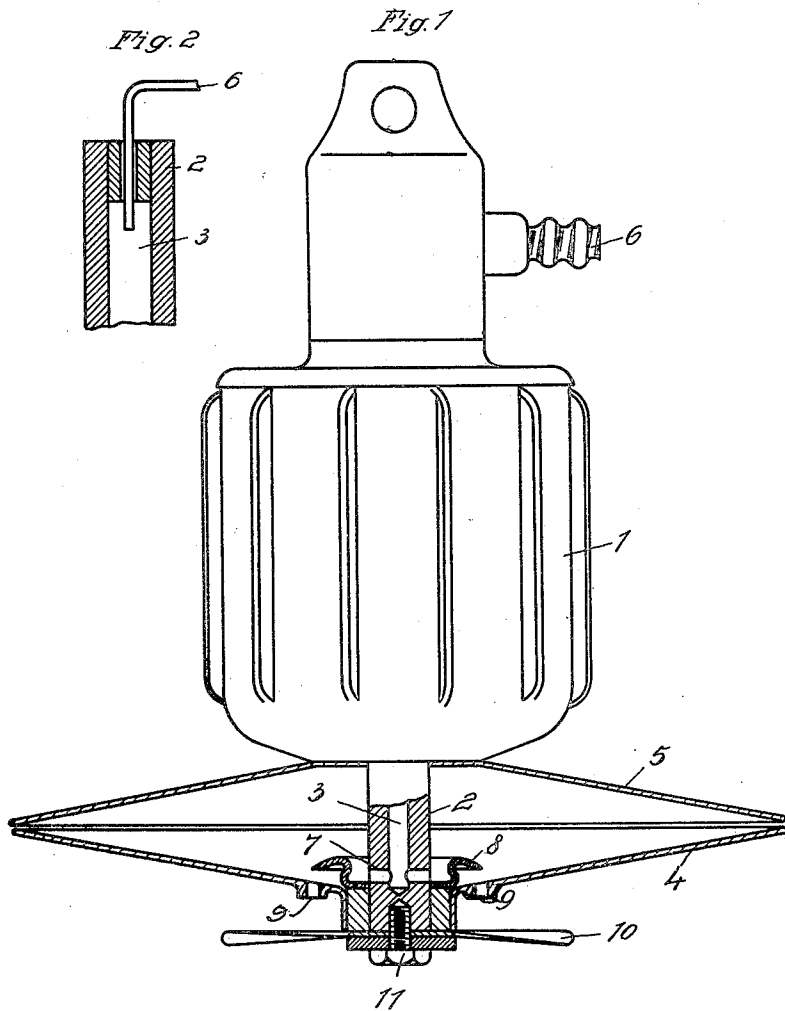
R. ELSÄSSER

1,764,437

ATOMIZER FOR LIQUIDS

Filed March 8, 1928

2 Sheets-Sheet 1



Inventor  
Robert Elsässer  
by *Knight Bros* Attorneys

June 17, 1930.

R. ELSÄSSER

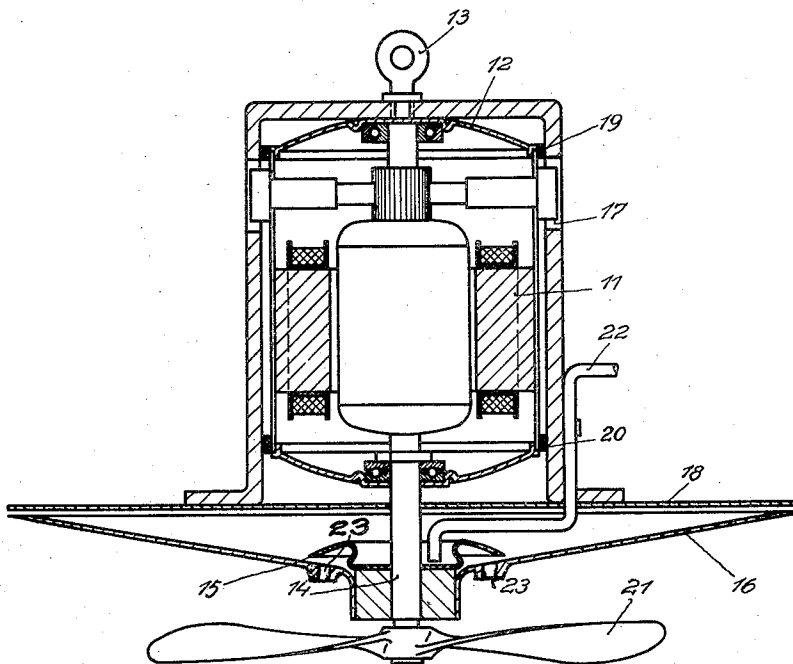
1,764,437

ATOMIZER FOR LIQUIDS

Filed March 8, 1928

2 Sheets-Sheet 2

*Fig. 3*



*Inventor*

*Robert Elsäßer*

*by Knight Bros*  
*attorneys*

# UNITED STATES PATENT OFFICE

ROBERT ELSÄSSER, OF BERLIN-CHARLOTTENBURG, GERMANY, ASSIGNOR TO SIEMENS-SCHUCKERTWERKE AKTIENGESELLSCHAFT, OF BERLIN-SIEMENSSTADT, GERMANY, A CORPORATION OF GERMANY

## ATOMIZER FOR LIQUIDS

Application filed March 8, 1928, Serial No. 260,094, and in Germany March 15, 1927.

My invention relates to an atomizer for liquids.

Up to now the atomization of liquids was effected by means of nozzles with very fine bores through which the liquid is forced under comparatively high pressure. Such atomizers have not proved satisfactory in the industries, such as textile mills or tobacco factories, where they are used as air humidifiers, because the fine bores in the nozzles soon become choked up by deposits of substances dissolved in the water and other impurities, so that it is necessary to clean or replace the nozzles frequently. Such atomizers or air humidifiers require, furthermore, compressed air or steam to effect the atomization of the liquid, so that the first cost as well as the operation and maintenance costs are very high. To eliminate these disadvantages it has already been proposed to equip atomizers or air humidifiers with revolving atomizing discs or wheels which throw the liquid into the air by centrifugal force. In such atomizers a sufficiently fine mist of liquid can not be obtained owing to the low speed of rotation, even when the liquid is thrown against baffle plates by the distributing disc and thus atomized by the impact.

According to my invention the liquid atomizer or air humidifier consists substantially of an atomizing disc driven by a motor with vertical shaft, the liquid entering the disc at the hub in a uniform thin layer and the disc having such a high circumferential speed, that the liquid applied to it is already before leaving the disc reduced to a fine state of division and thus leaves the disc in the form of a fine mist. Preferably the liquid is uniformly and in a thin layer supplied to the atomizer or sprayer disc by a distributor disc which forms a storage basin and the edge of which is turned over in such a way that the overflowing thin layer of liquid runs on to the atomizer disc

without impact. The liquid is preferably supplied to the atomizer or humidifier through the hollow motor shaft, which is so designed that the liquid can issue at the lower end of the shaft only.

An embodiment of my invention is by way of example illustrated in the drawings affixed hereto and forming part of my specification.

In these drawings:

Fig. 1, represents a sectional elevation of my improved atomizer or humidifier,

Fig. 2, a cross-section on an enlarged scale through the upper portion of the motor shaft, and

Fig. 3, a vertical section through a slightly modified construction of atomizer.

Referring to Fig. 1 of the drawings, 1 is the electric motor, which may be for instance of the three phase induction type and be fed by an alternating current of comparatively high frequency and thus attain high speeds. It is suspended vertically from an eye at the top, so that it is free to set itself in the correct position. The motor shaft is provided with an axial bore and carries at its lower end the atomizer disc 4, which is protected against dust by a hood or guard disc 5. The branch 6 which serves for connecting the apparatus with water mains or any other supply of water is at its inner end curved downwards and terminates, as Fig. 2 shows in section, into a bore 3 at the upper end of the shaft 2. The water issues from the shaft 2 through the horizontal or transverse bore 7. It accumulates in the distributor 8 forming a small basin or dish and overflows adjacent to the shaft in a fine layer uniformly and without impact on to the atomizer disc or wheel 4. Below this atomizer disc 4 is mounted a fan, propeller or blade wheel 10, by means of the screw 11. It consists of a considerable number, say six or more small blades, and may be of various designs. Preferably

it will be punched out of a single disc of sheet iron with the blades pitched in a suitable manner.

Owing to the high velocity of the atomizer disc the water is distributed as an extremely thin layer and leaves the edge of the atomizer disc in the form of a very fine mist, the atomized water being distributed over a large area, since a vigorous flow of air is set up underneath the disc by the fan. It is essential that the water is conveyed on to the atomized disc in the vicinity of the shaft in a thin and uniform layer and without any impact or axial thrust, since only in this way it is possible to obtain a uniform distribution of the water. To prevent the dish formed by the atomizer disc from filling up with water, by reason of the motor having stopped owing to the failure of the current, drip holes 9 are provided adjacent to the shaft through which holes the inflowing water drains away when the disc stops. A warning is thus given to shut off the water supply to the atomizer.

For driving my improved atomizer, small three-phase motors are particularly suitable, which are preferably fed with current of comparatively high frequency from a three-phase network across a small frequency converter. Such motors have a very low power requirement only and small dimensions, so that the atomizer may be of small dimension, requiring very little space.

A particularly simple compact and inexpensive construction is attained, if the driving motor is designed as so-called built-in motor in the manner of the small motors used in vacuum cleaners and the like, and enclosed by a cap.

Fig. 3 of the drawing illustrates an atomizer, equipped with such a motor. The electric motor 11 constructed as built-in commutator motor for direct and alternating current and which is capable of developing a high speed, is suspended from an eye-bolt 13 screwed into the upper bearing shield 12. At the lower end of the motor shaft 14 is mounted the distributor 15, as well as the atomizer disc 16. The motor 11 is enclosed by a sheet-iron cap or bell 17 provided at its lower open end with a protective hood 18 for the atomizer disc 16. Between the cap 17 and the motor 11 there are provided rubber rings 19 and 20 which act as silencers so that the atomizer may also be employed in rooms in which unnecessary noises must be avoided, such as theaters, infirmaries and so on. Below the disc 16 is provided the fan 21 which consists of a plurality of blades of slight inclination punched out of a sheet-iron blank.

The liquid is supplied to the atomizer by a pipe 22 attached to the cap 17 and opening into the distributor 15. The liquid flows uniformly over the edge of the distributor

15 in a fine film and smoothly on to the atomizer disc 16. Close to the shaft 14 there are provided drip holes 23 in the disc 16 through which the liquid issues when the disc 16 is arrested.

Atomizers, humidifiers or sprayers according to my invention are particularly valuable for industrial enterprises, such as textile mills or tobacco factories, in which the air should always contain a certain percentage of humidity. The presence of dust or fluff inherent in such factories does not interfere with the satisfactory operation of the machine, since it does not possess any fine openings liable to be clogged up.

The atomizer is suitable for atomizing liquids of any kind. Besides water, scented liquids, disinfectants and the like may be atomized. In such a case the branch of the supply pipe will preferably be connected to a tank containing the liquids in question.

Various modifications and changes may be made without departing from the spirit and the scope of the invention, and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art.

I claim as my invention:

1. In an atomizer for liquids, in combination, an atomizer disc, an electric motor with vertical shaft adapted to drive said atomizer disc, a protective hood adapted to cover said atomizer disc, a supply conduit for the liquid terminating near the center of said atomizer disc and adapted to feed the liquid to said atomizer disc in a uniform thin layer, a distributor disc mounted on the motor shaft and forming a collecting basin for the liquid, and a bent-over flange on said distributor disc adapted to conduct the liquid upon said atomizer disc smoothly and without impact.

2. In an atomizer for liquids, in combination, an atomizer disc, an electric motor with vertical shaft adapted to drive said atomizer disc, a protective hood adapted to cover said atomizer disc, a supply conduit for the liquid terminating near the center of said atomizer disc and adapted to feed the liquid to said atomizer disc in a uniform thin layer, a distributor disc mounted on the motor shaft and forming a collecting basin for the liquid, a bent-over flange on said distributor disc adapted to conduct the liquid upon said atomizer disc smoothly and without impact, and a propeller wheel mounted upon the motor shaft underneath said atomizer disc.

3. In an atomizer for liquids, in combination, an atomizer disc, an electric motor with vertical shaft adapted to drive said disc and consisting of a built-in motor, a cap enclosing said motor, elastic means between said cap and said motor adapted to silence the noise made by said motor, a pro-

5 tective hood covering said atomizer disc, a  
supply conduit for the liquid terminating  
near the center of said atomizer disc and  
adapted to supply the liquid to said disc in  
a uniform thin layer, a distributor disc  
forming a collecting basin for the liquid  
10 mounted upon the motor shaft, a bent-over  
edge on said distributor disc adapted to con-  
duct the liquid without impact on to said  
atomizer disc, and a propeller wheel  
mounted upon the motor shaft underneath  
said atomizer disc.

In testimony whereof I affix my signature.

ROBERT ELSÄSSER.

15

20

25

30

35

40

45

50

55

60

65