particle diameters of the mists are relatively small and almost uniform, the mists are not susceptible to the centrifugal force caused by the rotation of the spindle. Consequently, most of the mists do not remain in the spindle and are discharged.

However, when mists having a large particle size that is a certain particle size or more or oil droplets are mixed in the mists, they adhere to the inner wall of the spindle by the centrifugal force caused by the rotation of the spindle. As a result, the mists remain inside the spindle and can not be discharged sufficiently.

In this example, even when changing the rotating speed of the spindle within the range of 0–6000 rpm, mists do not remain inside the spindle. The mists can be discharged after being changed to oil droplets within about 1 second from the operation start of the coater. The discharging condition was good. Therefore, according to the present example, it can be conceivable that the mists that have flown into the mist-conveying pipe **67** have a relatively small particle size and are almost uniform.

INDUSTRIAL APPLICABILITY

As mentioned above, the liquid coater of the present invention can generate fine mists with a simple configuration by simplifying the structure of the mist generating part and can convey the mists at a high speed by providing a gas feed passage. Therefore, the liquid coater is excellent in fast-response. Thus, the liquid coater can be utilized as an oil feeder for feeding a cutting oil to a cutting edge of a machine tool such as a machining center, a grinding machine, or a lathe.

What is claimed is:

1. A liquid coater, generating mists from liquid in a container and discharging the mists to the outside of the container, wherein the liquid coater comprises:

a lower nozzle having a gas injection port in the liquid;

an upper nozzle having a gas injection port in the upper part of the container;

a mist conveying passage provided in the upper part of the container, the mist conveying passage conveying mists in the container to the outside of the container, and the mists are generated by injecting gas from the gas injection port of the lower nozzle; and

wherein the gas injection port of the upper nozzle and the gas injection port of the lower nozzle are arranged so that gas is injected toward an inner-wall side face of the container from both the gas injection ports.

2. The liquid coater according to claim **1**,

wherein the container is formed in a cylindrical shape.

3. The liquid coater according to claim **1**,

wherein directions injection port of the upper nozzle and of the gas injection port of the lower nozzle are arranged so that circulating directions of the gas injected from the gas injection port of the upper nozzle and of the gas injected from the gas injection port of the lower nozzle are opposite to each other.

4. The liquid coater according to claim **1**,

wherein a reticulated filter is provided in the horizontal direction inside the container and the container is divided into an upper part and a lower part by the filter.

5. The liquid coater according to claim **1**,

wherein a gas flow-regulating valve is connected to at least one of the upper and lower nozzles.

6. The liquid coater according to claim **1**,

wherein the end of the mist conveying passage inside the container is provided almost at the center in the horizontal direction of the container.

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