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AIRBORNE CHEMICAL DISPENSER

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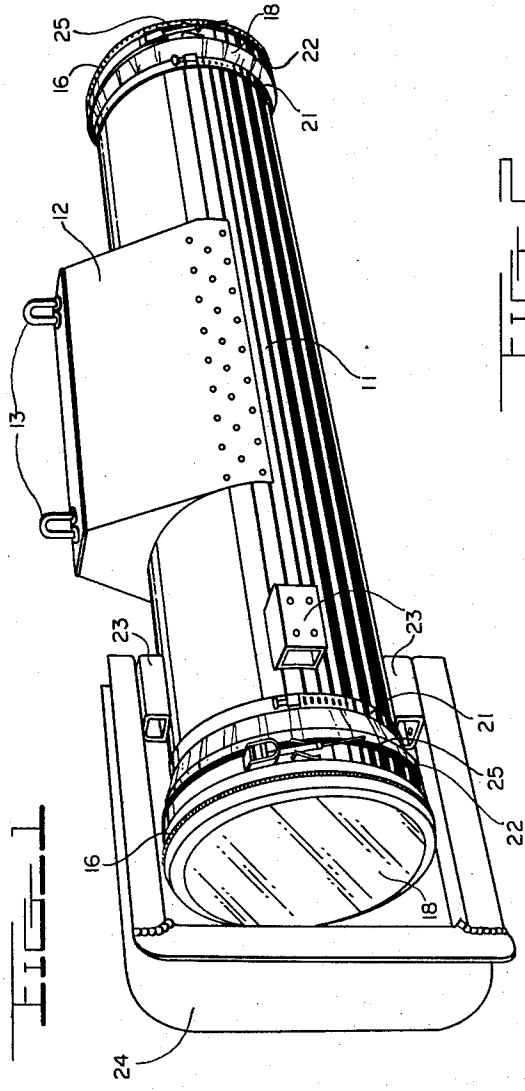


FIG. 1

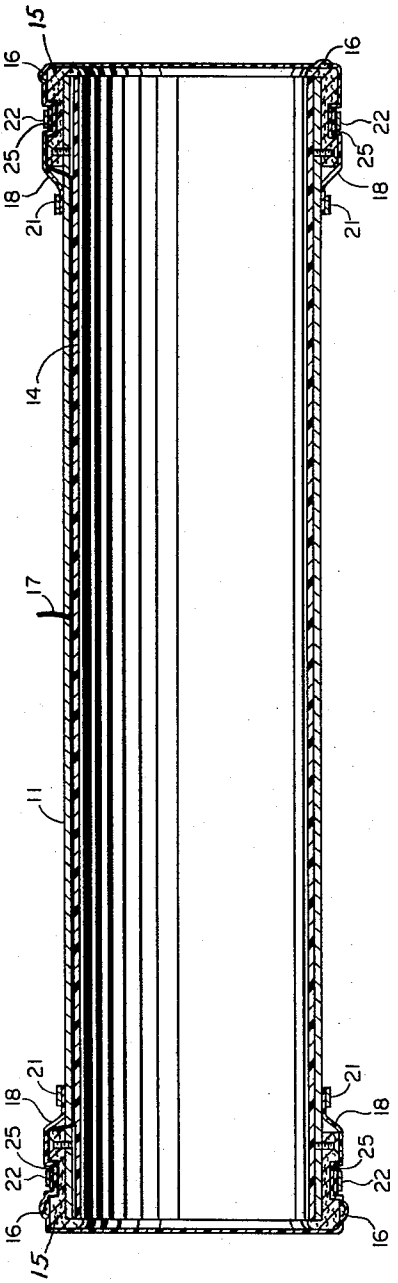


FIG. 2

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AIRBORNE CHEMICAL DISPENSER

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The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties, thereon or therefor.

The present invention is directed to material dispensers, and more particularly, to a dispenser for releasing large amounts of materials or chemicals in a short time and dispersing the chemicals in a predetermined pattern.

Heretofore, various types of dispensers have been used for dispensing materials into the atmosphere from aircraft for one purpose or another. These dispensers have their drawbacks, such as the dispensers becoming plugged or clogged, which prevents satisfactory dispensing of the material, the materials not being dispensed in sufficient time to carry out the intended result. Nor is the material dispensed in a particular pattern.

It is, therefore, an object of the present invention to provide a dispenser which will dispense large amounts of particles or chemicals in a short period of time.

Another object is to disperse particles or chemicals in a predetermined pattern.

Still another object is to provide a dispenser suitable for dispensing different types of particles for a plurality of purposes.

Other and more specific objects of the invention will become apparent upon a careful consideration of the following detailed description, when taken together with the accompanying drawings, in which:

FIG. 1 is a view in perspective, which illustrates the features of the device; and

FIG. 2 is a cross sectional view illustrating the relative parts of the device.

The present invention is directed to a particle dispenser comprising a metal tube, which has ends of greater diameter than the body and an inner liner of Teflon or any other suitable material, which extends the entire length of the tube. The outlet end of the dispenser is provided with a deflecting baffle of a particular design to disperse the particles in a predetermined pattern. A plastic sleeve is placed over each of the ends around the tube, and about the plastic sleeve, a nichrome resistance heating element is placed near the ends of the tube. A plastic diaphragm is stretched over each end of the tube, over the nichrome heating element and secured in place by adjustable bands placed about the end of the tube. An electrical current is directed to the nichrome heating elements, which melts the diaphragms at each end and permits particles contained in the tube to be forced therefrom by the ram air pressure provided by movement of an airplane upon which the device is carried. Particles forced from the dispenser are dispersed by the baffle secured to the end of the tube.

Now, referring to the drawings, there is shown by illustration, a device made in accordance to the present invention which includes a metal open ended tubular member **11** that is provided with a support bracket **12**, including eye hooks **13** by which the dispenser is connected with a suitable carrier, such as a bomb rack on an airplane or any other suitable device by which the dispenser is carried. The tubular member **11** has a lining **14** of insulating material, such as fiberglass, Teflon, or any other suitable material, secured to the inner surface, which protects the metal from any chemicals carried in the dispenser, and also provides a smooth surface which aids in dispersing the particles being dispensed. Each end of the tubular member is provided with a sleeve **15** of insulating material about the outer surface thereof, about which nichrome heating elements **16** are secured and connected in parallel electrically. The lead lines **17** from the heating elements secured about each end pass through suitable holes in the tubular member in the vicinity of the ends of the heating element and are passed along the inner surface of the tubular member between the inner lining **14** and the tubular member. The lead lines are brought out at the support and adapted to be connected electrically with a power source located and controlled by the carrier, such as any airplane or any other suitable device. In order to contain the chemicals, particles, etc., in the tubular member, a plastic diaphragm **18** is stretched over each end, over the insulated sleeves **15** and the nichrome heating elements **16**, and secured in place by straps **21** and **22**. Strap **21** is secured first, which holds the diaphragm in place and relatively tight, then strap **22** is applied near the nichrome heating element to insure that the diaphragm is held tightly against the nichrome heating elements.

The dispensing or aft end of the dispenser is provided with brackets **23** on directly opposite sides of the tubular member for the purpose of securing a deflecting baffle **24**. The deflecting baffle can be of any desired shape, which disperses the dispensed particles in a predetermined pattern.

The dispenser is made of the tubular member with the inner lining, the sleeve about each end, the nichrome heating elements secured about the sleeves near the end of the tubular member and with the deflector and the support brackets. This structure makes up the dispenser and can be used many times in dispensing various types of particles, chemicals, etc. In use, one diaphragm is secured over one end of the tubular member, about the nichrome heating element, and secured in place by straps **21** and **22**. The dispenser with one diaphragm secured in place is then turned with the open end in an upright position and the tubular member is then filled with the particles or chemicals to be dispensed. After filling the dispenser, the second diaphragm is secured in place to retain the matter to be dispensed in the dispenser until it is desired that the matter be dispensed. Since the dispenser is provided with an insulating liner and the diaphragms are of a plastic material, the dispenser can be stored for some time with the material therein, without harmful effects on the dispenser. The diaphragm on the forward end is of a thicker plastic than that on the rear, so that when an electrical load is applied to the heating elements, the rear diaphragm will burn through first to insure the particles being forced from the dispenser in the right direction.

In operation, the dispenser is loaded as described above, and then loaded onto the carrier from which the particles are to be dispensed, such as an airplane. In case of an airplane, the dispenser is loaded onto the bomb rack of the airplane and the electrical load lines are connected to the electrical circuit of the aircraft. When the aircraft is in flight and in the proper area for dispensing the particles, the electrical switch that controls the load to the nichrome heating elements is closed. The electrical load applied to the nichrome heating elements heats the elements, which burns through the plastic diaphragm on the rear, first, and shortly thereafter, the forward diaphragm burns through and the ram air pressure caused by the motion of the airplane forces the particles from the dispenser in a very short time. The baffle, or deflector, secured to the rear of the tubular member deflects the particles into the slipstream of the aircraft, where the particles are dispersed into a predetermined pattern in accordance with the design of the baffle, or deflector.

A dispenser such as illustrated above can be used for releasing chemical agents into clouds in connection with cloud modification studies, for weather modification studies, cloud physics research, cloud marking techniques, clear air turbulence studies and the creation of unique radar targets, such as chaff, in electromagnetic counter-measure experiments.

The dispenser has been described as having a metal tubular member with an insulating liner; however, it will be obvious to others that the tubular member could be made of other material without departing from the invention. Also, the dispenser can be made of any desirable length and diameter, depending on the use and the amount of material to be dispensed.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A particle dispenser which comprises an elongated tubular member, an electrical heating element secured completely around each end of said tubular member on the outer surface near the ends thereof, means for connecting said electrical heating elements with an electrical load, end cover means adapted to be secured over the ends of said tubular member and said heating element around each end, said end cover means adapted to be burned through by said heating element in the vicinity thereof.

2. A dispenser as claimed in claim 1 wherein said tubular member has a particle deflector secured thereto near the after end thereof and positioned across a diameter of said tubular member.

3. A particle dispenser which comprises an elongated tubular member, support means connected to said tubular member, an electrical heating element secured completely around each end of said tubular member on the outer surface near the ends thereof, a cover adapted to be placed over each of the ends of said tubular member, said end covers adapted to burn through in the vicinity of said heating element by an electrical load applied thereto.

4. A particle dispenser which comprises an elongated metallic tubular member, support means connected to said tubular member, an insulating lining secured along the inner surface of said tubular member, an insulating sleeve secured over the outer surface of said tubular member at each end thereof, electrical heating elements adapted to be secured about said insulating sleeves near each end of said tubular member, said electrical heating elements being connected in parallel electrically and adapted to be connected with an electrical supply, a plastic covering adapted to be placed over each end of said tubular member and over said heating element, and strap means for securing said plastic cover in place about said ends of said tubular member.

5. A particle dispenser as claimed in claim 4, which includes a baffle secured to the end of said tubular member, from which the particles are dispensed.

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