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NON-HAZARDOUS DISPERSING SYSTEMS FOR
LIQUIDS AND VOLATILE SOLIDS
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3,117,521

Fig. 2

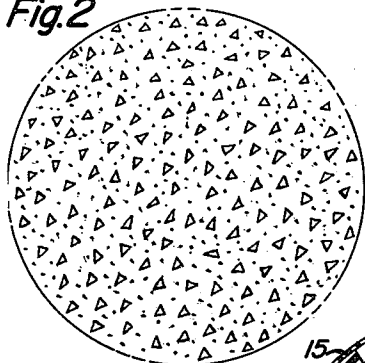


Fig. 3

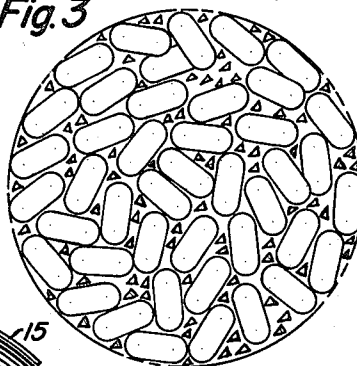


Fig. 1

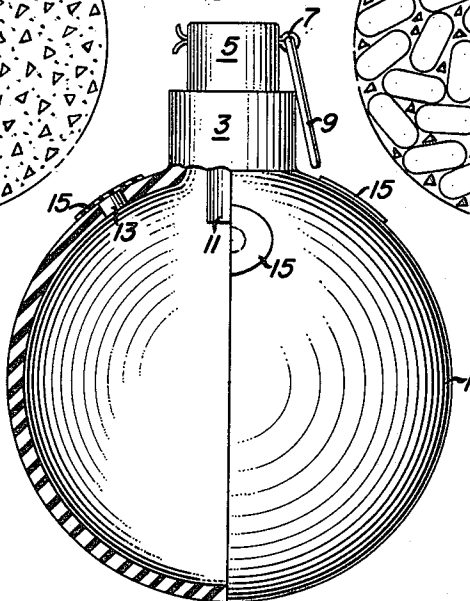


Fig. 4

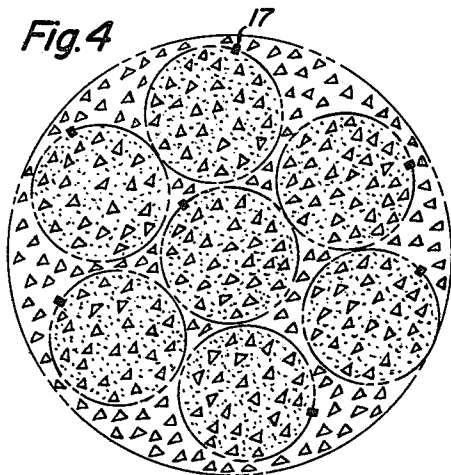
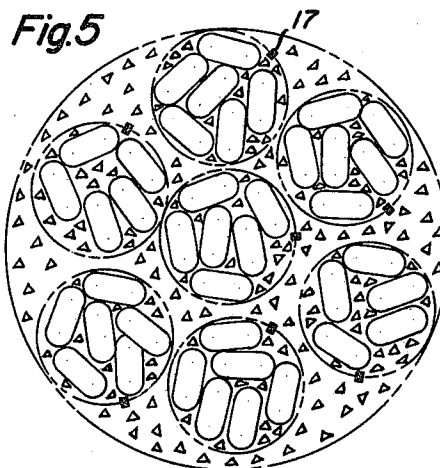


Fig. 5



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NON-HAZARDOUS DISPERSING SYSTEMS FOR LIQUIDS AND VOLATILE SOLIDS

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4 Claims. (Cl. 102-65)

(Granted under Title 35, U.S. Code (1952), sec. 266)

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 to me of any royalty thereon.

This item relates to non-hazardous dispersing systems for liquids and volatile solids.

More specifically, the invention comprises a resilient container which, when in completed state, is intended to be used as a non-hazardous grenade.

A further object of the invention is to provide a non-hazardous grenade, which covers two types of non-hazardous dispersing systems. The first system utilizes explosive dissemination, both high and low order; and the second system utilizes gas producing fuels to disseminate the materials in close proximity to the target without causing injury or damage.

These and other objects and features of the invention will more fully appear from the following description and the accompanying drawing and will be particularly pointed out in the claims.

Referring to the drawing,

FIG. 1 is a partially sectionalized elevation of the container.

FIG. 2 is a diagrammatic representation of a sectionalized container showing the basic internal filling.

FIG. 3 is a diagrammatic representation of a sectionalized container showing a modified version of the internal filling.

FIG. 4 is a diagrammatic representation of a sectionalized container and plurality of spheres therein, showing the internal filling.

FIG. 5 is a diagrammatic representation of a sectionalized container and plurality of spheres therein, showing a modified version of the filling.

The body member 1 is a resilient hollow natural or synthetic rubber container which can be made in any size or shape (only the spherical shape is shown) in any convenient way, as for an example by the dipping process or in any other corresponding manner. The container is made such that its constricted tubular neck 3 is capable of holding by friction the fuse 5 so that both of these can be properly sealed to each other. The said fuse at the upper end is penetrated with a cotter pin 7, having a pull-ring 9, while at the lower end it has a primer mixture pellet 11. The said fuse may be of any suitable construction or one of the more conventional hand grenade types such as covered by the U.S. Patent 2,203,640. Diametrically located, the container has a plurality of vent holes 13 which are sealed off with patches 15, made up of a thin resilient material. It will be readily apparent, that depending upon the desired results, any suitable number of the said vent holes or any suitable thickness of the said patches may be used.

In the explosive dissemination system, the resilient con-

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tainer contains a centrally located primer pellet 11 (as shown in FIG. 1) surrounded by a loose mixture of pyrotechnic material and the material to be dispersed i.e. volatile liquids or volatile solids as shown in FIG. 2.

If desired, the said material to be dispersed may be encapsulated and then placed together with the loose pyrotechnic mixture in the said resilient container (as shown in FIG. 3). The capsules being made of gelatin or any other equivalent quick melting substance. In use, they are almost instantly consumed by the heat thus releasing their contents. The charge used may be any explosive which will produce the desired effect. For an example, a 4½-inch spherical resilient container containing a desired filling can be exploded by 210 grains of pentaerythritol tetranitrate without causing injury to mammal targets at a 12-inch standoff. This system is applicable to both, the solids (as shown in FIG. 2) or liquids (as indicated in FIG. 3) encapsulated in a gelatin type of capsule.

The above dispersion can be effectively accomplished by controlling the internal pressure of said resilient container to any given requirement, by varying the container's thickness, the number and diameter of the vent holes, and the thickness of the resilient material patches over the said vent holes.

The second or alternate method (shown in FIG. 4) is a multiple source device consisting of the said resilient container filled with spheres while the void between the said spheres is filled with pyrotechnic material. The contents of the said spheres are the same as in FIG. 1, and are ignited by a small starter charge 17 located in an opening of each of the spheres. The said small charge in each sphere is ignited through means of the fuse, the primer pellet, and the pyrotechnic charge occupying the void between the spheres in a manner like an almost instantaneous chain reaction. The method used shown in FIG. 5 is identical to the method shown in FIG. 4, except here, the material to be dispersed is encapsulated. The above mentioned encapsulated material can be in a liquid as well as in a volatile solid form. The alternate methods are capable of dispersing the ignited sphere over much wider area.

The second system utilizes gas producing fuels to disseminate the materials in close proximity to the target without causing injury or damage. It may be further pointed out here that in each of the above systems, when the said grenade is exploded, the fuse itself will harmlessly fall to the ground without causing any injury.

The non-hazardous grenade herein described may also be used in dispersing irritant agents such as tear gas etc., in any situation where it is required to disperse any type of material, such as riot control, signalling smokes, and the like.

While a preferred embodiment of the present invention has been illustrated in the foregoing specification, it is not intended to be limited thereto, but it is contemplated that it includes all modifications and embodiments within the spirit and scope of the appended claims.

I claim:

1. A grenade for dispersing liquid and volatile material, comprising a hollow resilient container having a tubular neck, and fuze means located in said neck, said container having a pyrotechnic charge therein with a plurality of spheres interspersed in said charge, said spheres having

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a filling of said pyrotechnic charge intermixed with said material to be dispersed and each of said spheres being capable of being ignited and dispersed over a wide area upon explosion of said grenade.

2. A grenade of the character described in claim 1 wherein each said sphere has a small starter charge thereon for the igniting of the filling material of said spheres, said filling material consisting of a loose mixture of pyrotechnic material and gelatin capsules, said capsules containing volatile solids whereby upon the explosion of said grenade, said starter charge, said filling material and said capsules are ignited and consumed by the heat created by the said loose mixture of pyrotechnic charge of said spheres thus releasing said volatile solids therefrom.

3. A grenade of the character described in claim 2 in which the material in said gelatin capsules is in liquid form.

4. A grenade of the character described in claim 1 wherein each said sphere has a small starter charge thereon for ignition of the filling material of said spheres,

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said filling material consisting of a loose mixture of pyrotechnic material and volatile solids whereby upon the explosion of said grenade said starter charge and said filling material are ignited thus releasing said volatile solids therefrom.

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