RECOVERY OF DRY CHEMICAL FIRE EXTINGUISHING POWDERS USED FOR TEST PURPOSES
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RECOVERY OF DRY CHEMICAL FIRE EXTINGUISHING POWDERS USED FOR TEST PURPOSES

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Claims. (Cl. 173--451)

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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 relates to testing of fire extinguishers of the dry powder type and more particularly to the recovery of dry chemical fire extinguishing powders during testing of a fire extinguisher.

Dry chemical fire extinguishing powders such as sodium bicarbonate base powders have been used for years as a dry chemical extinguishing agent. Additives such as a magnesium stearate increase flowability and moisture resistivity and with continued research some new materials have been introduced into the field. Potassium bicarbonate as a base agent is used for Class B-flammable liquid fires with a base agent of mono and diammmonium phosphate being used for Class ABC-all types of fires. Extinguishers range in size from 2½ lbs. capacity of the hand type to large trucks of 7500 lbs. capacity. In testing these extinguishers, the chemical contents must all be expelled from their containers by pressurizing gas, either air or nitrogen in a stored pressure type or nitrogen or carbon dioxide in the cartridge or cylinder pressurized type.

During testing, the usual way is to expel the dry chemical powders into the atmosphere where it cannot be recovered. Not only is this costly but it is rather messy with the powders blowing along with the wind. The cost of such powders range from 20 cents/lb. to about one dollar/lb.; therefore, it is desirable to provide a system by which the dry chemical powders can be recovered and yet permit free flow of the powders from the extinguisher to the very end of the discharge from the extinguisher being tested.

It is therefore an object of the present invention to provide a system for recovering dry chemical powders discharged from a fire extinguisher during test.

Another object is to provide a simple, inexpensive system for recovering the dry chemical powders of a fire extinguisher during test without impeding the discharge flow of the powders and without harmful effects on the powders.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the annexed drawing, wherein:

FIG. 1 illustrates a small container with an inflatable plastic-covering secured thereto.

FIG. 2 represents a larger container with an inflatable plastic-covering secured thereto by clamps and includes a slide opener in the bottom of the container, and

FIG. 3 illustrates a large container having an inflatable cover secured over the open end thereof.

The invention makes use of an open ended container 10 to which an inflatable cover 11 has been secured to contain the dry chemical powders and expandable pressurized gases expended when a fire extinguisher 12 is being tested. The capacity of the container and inflatable cover must be sufficient to contain the powders and gases therein about atmospheric pressure while permitting the pressurized gases expended from the fire extinguisher to expand without any undue pressure on the covering. The inflatable covering can be made of any suitable non-extensible or extensible material so long as the capacity is sufficient to prevent any pressure build-up within the confines of the container and cover. An aperture 13 is made in one side of the container to receive the fire extinguisher nozzle 14 for expending the powder under pressure into the container. The hole is made in the container at a distance from the bottom which is slightly higher than the expected level of the powder at the end of the test so that the discharge "clears" the powders or is above the powders in the container.

The covering can be held in place by a tape 15 such as shown in FIG. 1, by elongated clamps 16 as shown in FIG. 2, clamps about the periphery, or without any holding means such as shown in FIG. 3. Where the inflatable covering fits tightly about the outer surface of the container, it is not necessary to secure the covering in place.

The different figures represent different size containers which may be used for different sized extinguishers.

FIG. 1 illustrates a cardboard box with an inflatable plastic covering secured thereto which can be used for small extinguishers. FIG. 2 represents a container which is larger than that shown in FIG. 1 and has the inflatable covering secured thereto by elongated clamps. The container of FIG. 2 is provided with a slide door 17 at the bottom thereof through which the powders can be removed from the container to recharge the fire extinguisher. FIG. 3 represents a large container which may be used for extinguishers having large amounts of dry chemical powder therein. The cover shown on the container of FIG. 3 fits tightly about the periphery of the container and therefore needs no means for securing the cover in place. However, any suitable means could be used to secure the cover in place. The means by which the inflatable covering is held in place is not important just so long as the container and covering contain the powders and pressurized gas which forces the powder from the fire extinguisher.

In operation, the inflatable covering is secured in place over the container and the fire extinguisher nozzle is inserted into the opening in the side of the container. If desired, before testing, the interior of the container may be purged with dry nitrogen or air to prevent discharge into a humid atmosphere. The fire extinguisher is discharged and the pressurized air associated with the extinguisher forces the powder from the extinguisher. Upon discharge into the container, the powders impinge on the inner opposite side of the container losing its velocity and falls to the bottom of the container. The pressurized gas expands and on expansion inflates the covering over the container. The chemicals are forced from the extinguisher by the pressurized gas with a relationship in quantities sufficient to keep the powder fluidized to permit free flow through the discharge hose and nozzle. The container and inflatable covering must have a capacity sufficient that the powder does not cover the nozzle of the extinguisher in the container and the gas has sufficient room to expand without any inner pressure on the inflatable covering except that required to inflate the covering secured over the container which is slightly greater than atmospheric pressure.

As shown by the drawing, the containers can be square, rectangular, round, or any other suitable shape so long as the structure and expandable cover has sufficient volumetric capacity to hold the powders and expanded gas. The containers can be made of any suitable type of material as long as it will withstand the force of the powder and expanding gas on the opposite side from the aperture through which the nozzle of the extinguisher is inserted.

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 method of recovering dry chemical fire extinguishing powders discharged during testing of a fire extinguisher by an expandable gas under high pressure which comprises:
   (a) securing an expansible cover over the open end of an open ended container,
   (b) purging the interior of said covered container by use of a dry gas from a group consisting of a dry nitrogen and dry air,
   (c) inserting a fire extinguisher nozzle, of a fire extinguisher to be tested, into an opening in one side of said container at a height greater than the final height of powders after being expended from said fire extinguisher,
   (d) discharging said powders from said fire extinguisher,
   (e) directing said expended powders toward the side of said container directly opposite from the side through which said nozzle is inserted, and
   (f) removing said fire extinguisher nozzle from said container after expending all of the powders therein.

2. A method as claimed in claim 1 wherein said purging gas is of nitrogen.

3. A method as claimed in claim 1 wherein said purging gas is of dry air.

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