July 5, 1966 P. McCROSSAN 3,259,194

LIGHT-WEIGHT PORTABLE FIRE EXTINGUISHERS

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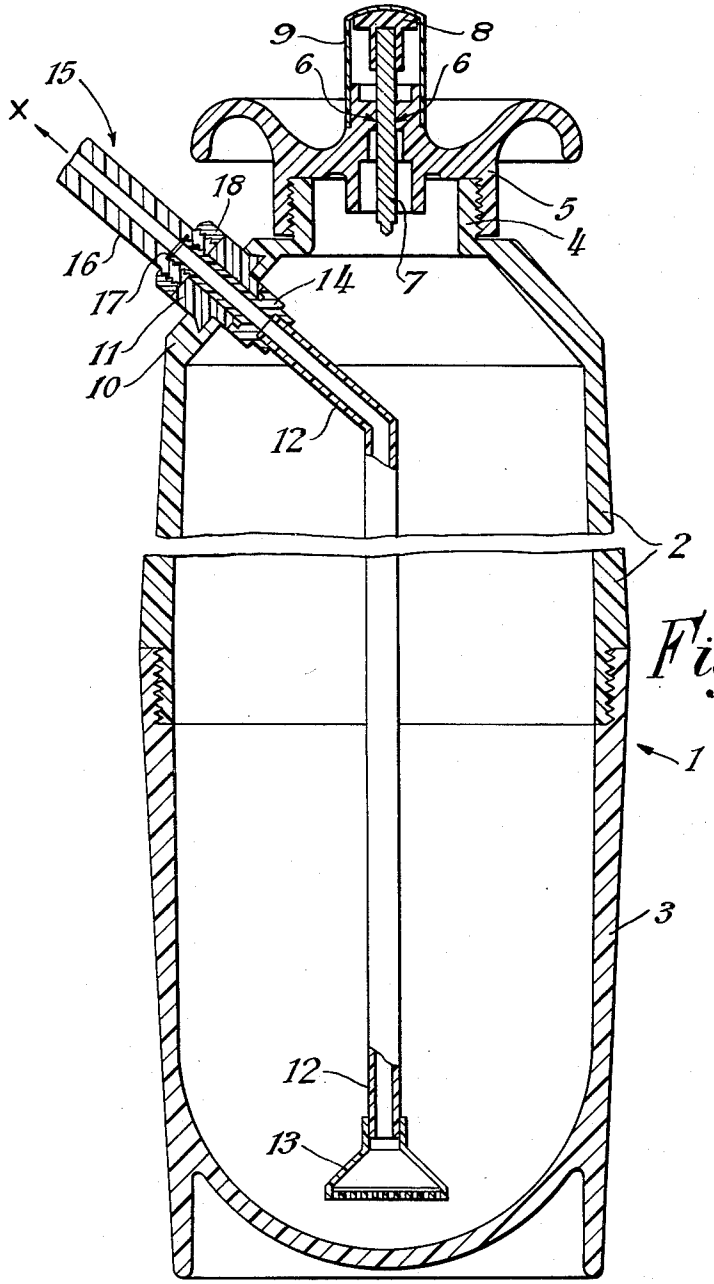


Fig.1.

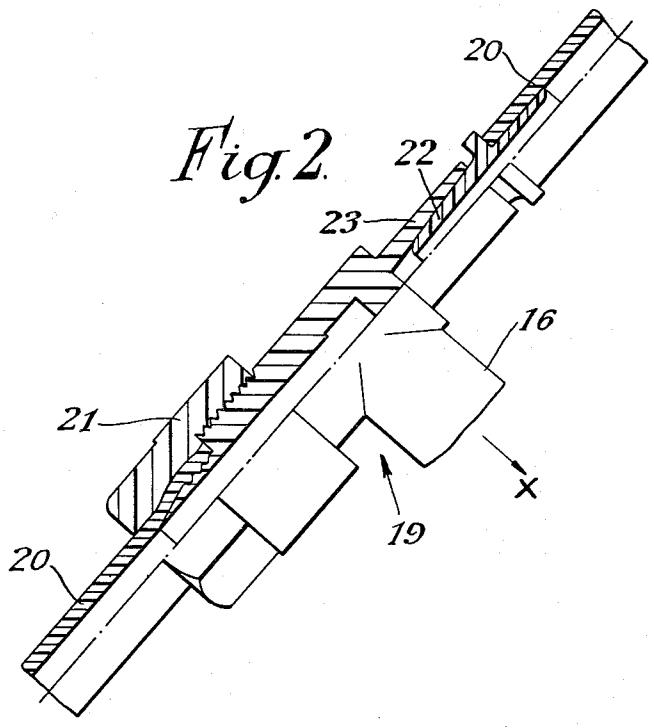
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Fig. 2.



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LIGHT-WEIGHT PORTABLE FIRE EXTINGUISHERS

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The present invention relates to fire extinguishers, and particularly, although not exclusively, to the portable kind known as "water type (gas pressure)" extinguishers. A general description of extinguishers of this kind will be found in British Standards Institute specification No. 1,382 (1948).

The invention is suitable also for use with other types of extinguisher such as those using carbon tetrachloride, or soda-acid extinguishers and foam extinguishers.

In water (gas pressure) extinguishers a high pressure gas cartridge is screwed into the head of the container which is filled to a required level with water. The extinguisher is operated by striking a knob. This breaks or pierces the gas cartridge and the gas is released into the extinguisher which then discharges a jet of water to a distance generally of about 40 ft.

Due to the high internal pressure the container has to withstand (normally up to 500 p.s.i.), known containers have been constructed of metal, either copper or specially treated steel. The ancillary parts such as the cap and hose fitment are also normally constructed of metal. This adds considerably to the weight of the extinguisher and also introduces the risk of corrosion.

According to the present invention there is provided a method of making a container for a fire extinguisher comprising the steps of producing, by moulding a thermosetting resin, two cups one of which is formed with a pair of apertures at or near its otherwise closed end, sealing into the apertures a striker mechanism and a hose fitment respectively, loading the apertured cup with fire extinguishing accessory apparatus such as a gas cartridge and sealing the cups together at their open ends.

According to a further feature of the invention, there is provided a fire-extingnisher container comprising two cups made of thermosetting resin sealed together at their open ends, one cup being formed with two spaced apertures at or near its otherwise closed end, a striker mechanism and a hose fitment being sealably fitted in the two apertures respectively.

The material used for the container must have a high tensile strength. It is therefore preferred not to use thermoplastic resins which generally retain some thermal stress after moulding and are liable to soften and lose shape at above average atmospheric temperatures. Many known types of thermosetting resin are now known which would be suitable when reinforced, as will be apparent to those skilled in the moulding of plastics. Particularly suitable materials are the group known as Dough Moulding Compounds (D.M.C.) which comprise a base of polyester or epoxide resin in which is dispersed a high content of filler or reinforcement material, which in the preferred compounds includes glass fibre of various lengths.

Such compounds are suitably moulded by compression. A male tool is brought down upon a female mould containing the D.M.C. (with the addition if necessary of a catalyst or hardener) in suitable quantity and the viscous material is forced to fill the space in between and allowed to set.

An example of a suitable D.M.C. compound is the product sold under the registered trade mark Rockite K–501, which is a glass fibre reinforced polyester resin. This has a specified tensile strength of 7,000–10,000 p.s.i.

It has also other propetries of particular advantage in the present invention, namely:

(1) Good impact strength over a wide temperature range.

(2) Flexural and tensile strengths which do not vary appreciably with temperature.

(3) Ability to withstand exposure without too high a degree of ageing.

(4) Low water absorption.

(5) High thermal stability.

It will be appreciated however, that many other materials having similar properties are now commercially available, in particular they are common to nearly all compounds of the D.M.C. group. Preferred reinforced synthetic resin compounds should have a tensile strength of over 5,000 p.s.i.

A preferred embodiment of the invention will now be described by way of example and with reference to the accompanying diagrammatic drawings, in which:

FIG. 1 is a longitudinal cross-section through a water (gas pressure) fire extinguisher of the invention, including a hose connection, and

FIG. 2 is a view partly in cross-section of the combined hose and connector and nozzle holder on a larger scale.

The illustrated fire extinguisher container **1** is moulded in two parts, each of cup-like shape, namely an upper cup **2**, and a lower cup **3**, both being formed from Rockite K–501. The cups are formed with male and female screw threads, respectively, at their open ends and the thickness of the walls is suitably increased to take these threads. Preferably an industrial adhesive is applied to the threads before the two cups are joined so that a very strong sealed joint is formed. The formation of the container in two parts as illustrated in FIG. 1 makes the moulding operation much easier and also aids the fitting of the internal accessory parts which are preferably fitted before the two cups are joined. The completed container **1** has a slight barrel shape which adds to its strength and which also allows easy access to the interiors of the two cups **2** and **3** before they are joined.

The upper container cup **2** is moulded with an aperture in a screw-threaded neck **4** to hold a screw cap **5**. The screw cap **5** is also advantageously moulded from synthetic resin material and D.M.C. is preferred. The screw cap is formed with a bore **6** to hold a metal striker mechanism comprising a rod **7** which is fitted with a knob **8** of synthetic resin material. D.M.C. is again suitable, or nylon. The striker rod has a pointed lower end and is adapted to pierce a gas cartridge (not shown) in conventional manner when the knob **8** is struck. The protruding part of the striker rod **7** and the knob **8** are covered when not in use by a protective cap **9** which is suitably moulded from polyethylene of medium density.

The upper container cup **2** is also formed with an apertured thickened shoulder portion **10** to hold a mounting ring **11** for a hose fitment indicated generally at **15**. The mounting ring **11** is shown moulded into the shoulder portion **10**. It is itself preferably moulded from D.M.C. and may be formed integrally with the upper container cup **2**. Alternatively it may take the form of an externally threaded tube retained upon the container cup **2** by nuts and washers, the container cup **2** being moulded with a flat, thickened portion to provide an air tight seal.

A tube **12**, preferably of polyethylene, extends inside the container from the mounting ring **11** to a point near the bottom of the container and is provided at its lower end with a filter rose **13**. The tube **12** is held in place on the mounting ring **11** by means of an inner sleeve **14**.

A hose stem **16** is joined to the mounting ring **11** from the outside. The stem **16** has one end threaded both internally and externally. This end is screwed on to a

portion of the inner sleeve **14** which protrudes through the mounting ring **11**, a washer **17** being provided to form a good seal. A retaining nut **18** is threaded on the outside of the stem **16**.

The other end of the hose fitting **15**, i.e. the end remote from the container **1**, is formed with a union joint **19** (FIG. 2). The end of the union joint containing the bore for the fire-extinguishing liquid is formed in suitable manner as illustrated to retain a low density polythene hose **20**, a hose connector **21** being provided to hold the hose **20** firmly in position. The other end of the hose is provided with a nozzle **22** which for convenience is held in a socket **23** at the back of the union joint **19**, so that it is protected from being clogged with dirt or damaged. The hose may conveniently be wound around the extinguisher.

The whole of the hose fitting, including the stem **16**, union joint **19** and hose connector **21**, is preferably moulded from D.M.C. These parts are not required to be of such high tensile strength as the container, but they must have a high impact strength so as to be resistant to wear and tear over extended periods. The hose nozzle **22** is preferably moulded in medium density polyethylene. The container may have a capacity for convenient use of about two gallons.

Portable fire extinguishers according to the invention, such as the one illustrated, are very much lighter than metal extinguishers in current use, and consequently may be handled much more quickly. This adds greatly to their fire-fighting efficiency, and enables small models to be used by people of slight strength such as school children.

What we claim is:

1. A container for a portable fire extinguisher comprising two cups moulded from thermosetting resin, one of which cups is formed with a pair of apertures at its otherwise closed end, a striker mechanism sealed into one of said apertures and a hose fitting sealed into the other of said apertures, said fitting including a combined hose connector and nozzle retaining socket, and means sealing the cups together releasably at their open ends.

2. A container for a portable fire extinguisher comprising two cups made of thermosetting resin reinforced with glass fibers and removably sealed together at their open ends, one cup being formed with two spaced apertures at its otherwise closed end, a striker mechanism and a stem fitting being sealably fitted into the two apertures respectively, said stem fitting terminating in a joint unit carrying a hose connector and a nozzle holding socket, a hose having a coupling at one end, a nozzle at the other end and means securing said coupling end of the hose to the connector and said nozzle and temporarily in said nozzle holding socket.

3. A container for a portable fire extinguisher adapted to receive a high pressure gas cartridge and wherein the container must withstand high internal pressure up to approximately 500 p.s.i. comprising two molded cups each formed of reinforced thermosetting resin of high tensile strength, said two cups being interconnected with one another by male and female threads formed on the respective cups at the open ends thereof, said two cups when in assembled relationship defining a generally barrel-shaped outer configuration for the container with its maximum dimension at an intermediate portion of the container adjacent said threaded ends of the cups, one of said cups having a generally dome-shaped closed end and defining a strengthened bottom for the container, the other of said cups including a heavy shoulder portion spaced a substantial distance from the threads formed thereon, said shoulder portion joining with a relatively narrow neck having an open end, a cap closing off the open end of said neck, a striker mechanism movably supported by said cap and being adapted to reach a vulnerable part of a high pressure gas cartridge supported by the container, said shoulder having a recess formed therein, a mounting ring snugly disposed within said recess and sealed with respect to said container, said ring having a bore formed therethrough, and a tubular member extending through the bore in said mounting ring and sealed with respect thereto for discharging liquid from the interior of said container outwardly of said tubular member.

4. Apparatus as defined in claim **3** including a rupturable adhesive between the male and female threads formed on the respective cups.

5. Apparatus as defined in claim **3** wherein said striker mechanism comprises a rod slidably supported by said cap.

6. Apparatus as defined in claim **3** wherein said thermosetting resin consists of a polyester resin.

7. Apparatus as defined in claim **3** wherein said thermosetting resin consists of an epoxide resin.

8. Apparatus as defined in claim **3** wherein said resin is reinforced with glass fibers.

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