United States Patent [19]

Stamper

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[54] **CONDITIONING DEVICE FOR DEODORISING AND/OR ODOURISING AIR**

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Oct. 6, 1972	South Africa	72/7170
Oct. 6, 1972	South Africa	72/7171

[52] **U.S. Cl.** **4/213;** 4/72; 4/216

[51] **Int. Cl.** **A47k 3/22;** E03d 9/04; E03d 13/00

[58] **Field of Search** 4/136, 129, 133, 106, 216, 4/213, 217, 209, 210, 211, 72, 103, 96, 83

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Primary Examiner—Henry K. Artis

[57] **ABSTRACT**

This invention concerns a conditioning pack for deodorising and/or odourising air. The pack comprises a substance, for example activated carbon, through which air can pass and which alters the odour of the air on passing through it, and a battery for driving an air displacement means within or through the substance. The pack can be used for conditioning air from sanitaryware articles and can be disposeable.

1 Claim, 6 Drawing Figures

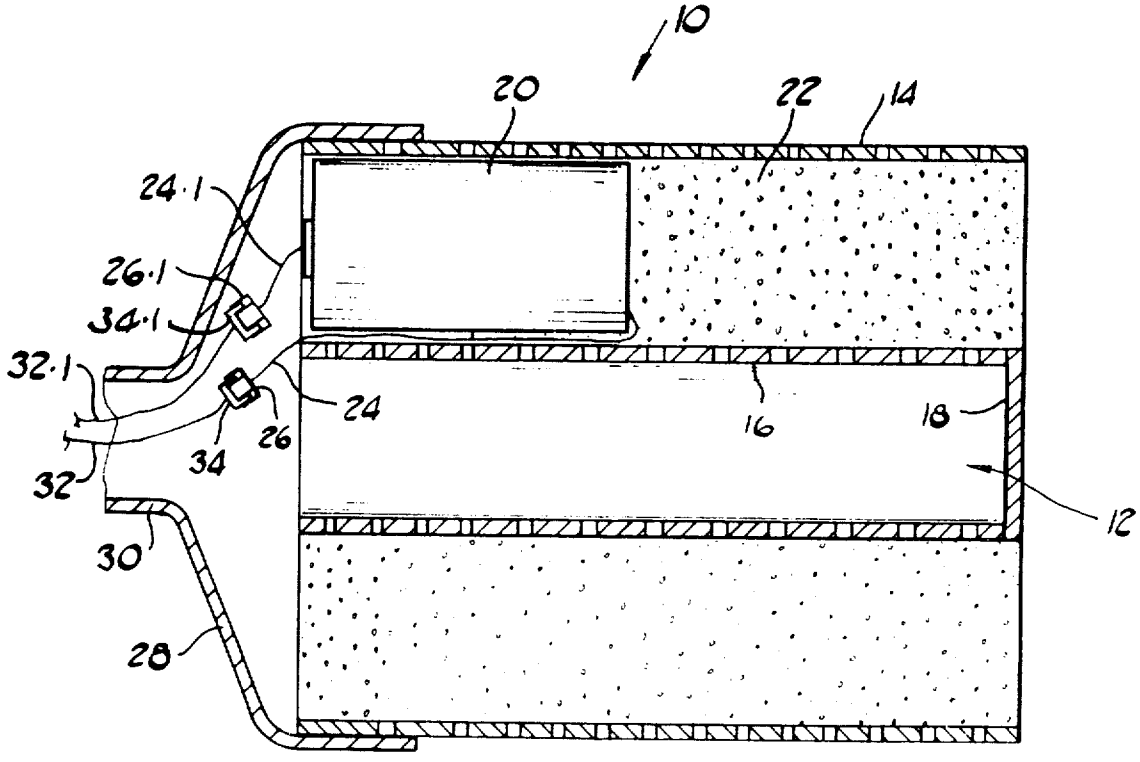
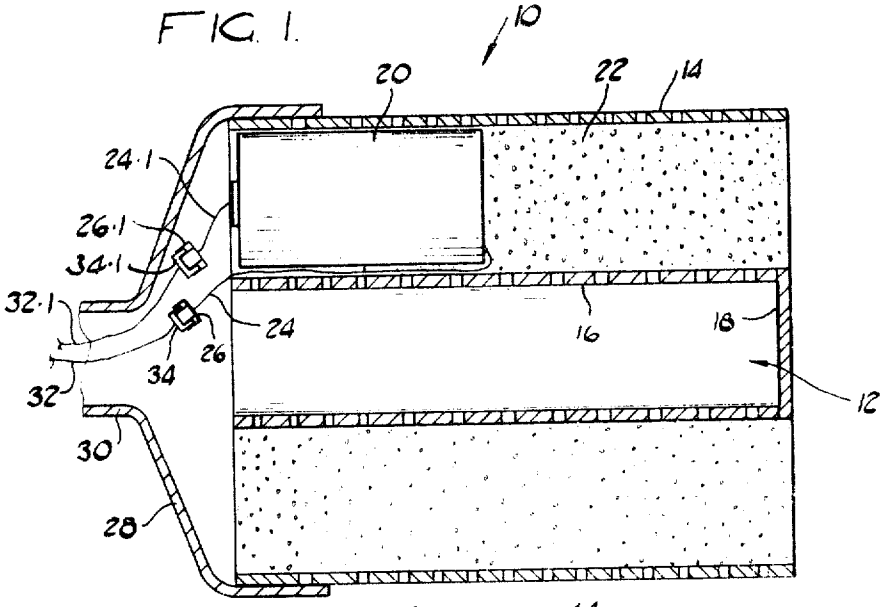


FIG. 1.



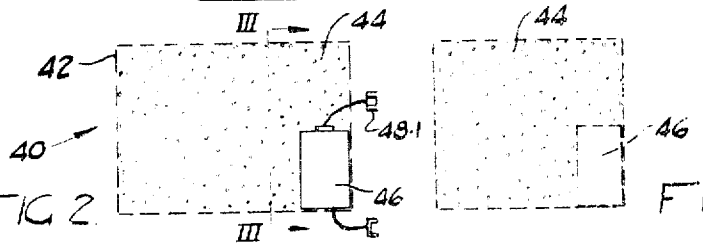


FIG 2.

FIG 3.

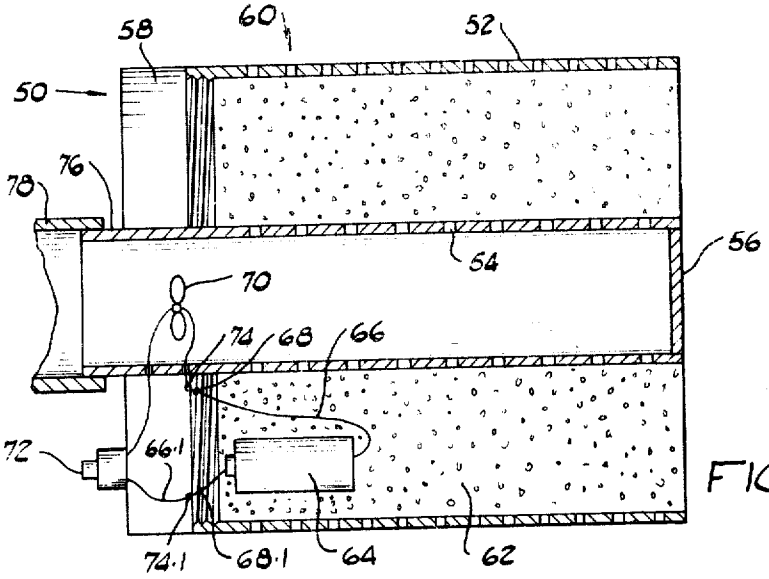


FIG. 4.

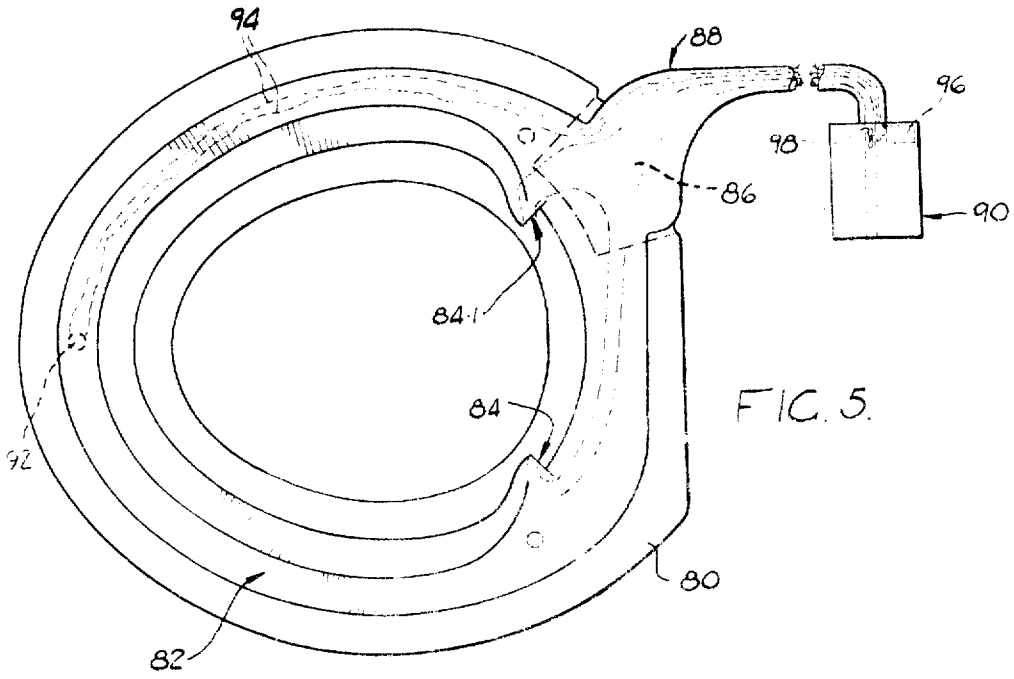

94
88
96
98
86
90
84-1
84
92
80
82

FIG. 5.

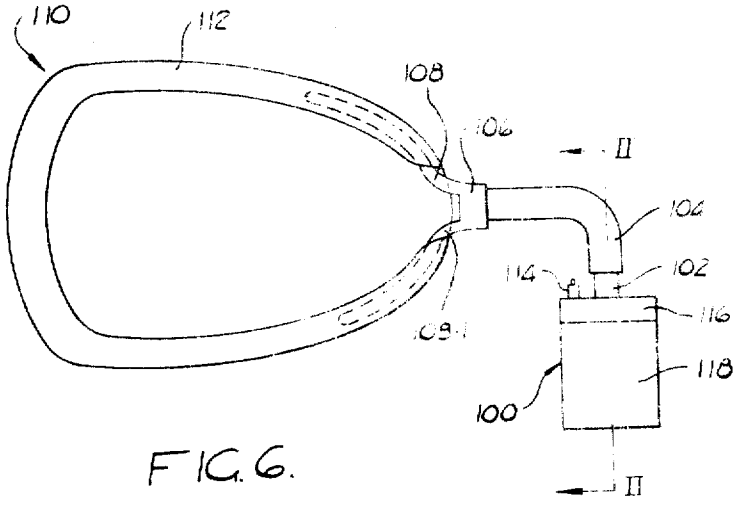

110
112
108
106
II
104
102
114
116
118
109-1
100
II

FIG. 6.

CONDITIONING DEVICE FOR DEODORISING AND/OR ODOURISING AIR

This invention relates to a conditioning pack for deodorising and/or odourising air.

The present invention provides a conditioning pack for deodorising and/or odourising air comprising a substance through which air can pass and adapted to alter the odour of air passing through, and a battery adapted to drive an air displacement means within or outside the pack for displacing air through the substance.

The conditioning pack provided by the invention may be used wherever it is desired to condition air by deodorising and/or odourising it. The invention is especially suitable for use in the deodorising of foul air from toilets, bedpans, commodes, and other articles of sanitaryware.

The battery may be mounted on the outside of a container containing the substance so that the battery is renewable separately from the pack. Alternatively the battery may be totally enclosed within the container so that when the battery needs replacing, the pack comprising the battery and the deodorising and/or odourising substance has to be discarded. The amount of such substance can be such that its usefulness is substantially exhausted at the same time as the battery. The battery may be a dry cell battery, for example a manganese alkaline cell. If desired, more than one battery an be supplied, whether the pack is of the throwaway tipe or of the battery-replacement type.

The air displacement means, e.g. a fan, may be mounted within the pack. Alternatively, the air displacement means may be mounted outside the pack, for example in a toilet seat which is in communication with the pack, or in a pipe leading to the pack to a source of foul air, e.g. a toilet, bedpan or the like. When the air displacement means is in the pack, wires can lead from the battery and air displacement means to a switch. Similarly, when the air displacement means is not in the pack, wires can lead from the battery to the air displacement means and a switch. The switch may be mounted beneath or in the underside of a toilet seat. The switch may be a pressure switch and can comprise two contacts mounted in a flexible material and separated by a void flexing of the material permitting electrical contact to be made. The contacts may be supported beam fashion across the void. The wires from the switch may end in terminals of the male/female press fit clip on type.

The pack may be in two parts, namely a head part containing an aperture through which air to be deodorising and/or odourised may enter the pack, and a body part containing the substance adapted to alter the odour of the air. The head part may be fittable on one end of the body part by means of a bayonet connection, screw connection or by being slid on that end. The head part may be attached to one end of a tube, the other end of which leads to the sourse of foul air.

The switch may be a pressure switch and can comprise two contacts mounted in flexible material and separated by a void flexing of the material permitting electrical contact to be made. The contacts may be supported beam fashion across the void.

For example in one embodiment, the other end of the pipe (i.e. the end not attached to the head part) may lead to the exterior of ducts in a toilet seat, said ducts being positioned to be in communication with the interior of a toilet bowl when the seat is lowered on the bowl. The underside of the seat may have a seal around it of a size and shape adapted to fit sealingly on a toilet bowl. The seal may be made of foamed or unfoamed plastics material, for example a suitable polyurethane plastics material. The ducts may pass through the seal and may be formed during the manufacture of the seal. The open ends of the ducts can be such that they face towards the rear of the toilet bowl when the seat is lowered. The seal may be moulded with a switch and wires present therein.

In another embodiment, the said other end of the pipe can have an inlet of a shape to be in communication with the interior of a sanitaryware article. The shape may be such as to fit over the top of, and into, a bedpan or toilet bowl. When the sanitary ware article is a toilet bowl, a seat (which may be a flush fitting seat) may make a seal with the top of the while permitting air to be extracted from the bowl. If desired, the seat may have a sealing ring around its underside, which may be attached to or moulded integrally with the toilet seat. The sealing ring may be of foamed polyurethane and may have a switch moulded integrally in it.

When the sanitaryware article is a bedpan, it may be manufactured of stainless steel, a ceramic material or a plastics material. The inlet end of the pipe, which will fit into the bedpan, may comprise a pair of diverging arms, each having a goose-neck like formation and optionally leading via a collector to the rest of the pipe. Such a formation for the inlet end of a pipe can fit under the lip which is usual on bedpans.

In a further embodiment, the inlet end of the pipe may end in a hollow resilient plug to be inserted in an air-removal hole in the article of sanitaryware, which may be a toilet, bedpan, or commode. The air-removal hole of the sanitaryware article may be closed by a grommet or solid plug when the pipe is not connected thereto.

The body part of the pack provided by the invention may comprise a perforated annular container for the substance to alter the dour of the air, air being able to enter down the centre and pass outwardly in a generally radial direction through the substance. Conveniently the substance to alter the odour of the air may be a substance which removes a foul odour by absorption and/or adsorption. For example activated carbon may be used. A substance which evolves a pleasant odour (e.g. a perfume) may be present in addition, or instead of the activated carbon.

Conveniently, the perforated container has a large outer surface through which the treated air may pass into the atmosphere. For example, the outer surface may ba a grid of metal or plastics material.

In yet another embodiment, the pack may be of a predetermined size and shape to fit within a cavity of a toilet ventilation apparatus and having matching terminals or connections to marry up with the terminals or connections of the pack. For example, the cavity may be provided in a toilet seat, and an air displacing means and a switch may form part of an electrical circuit to be completed by the battery.

The invention further provides a toilet bowl ventilation device in combination with the pack according to the invention, as well as a toilet seat in combination with the pack according to the invention.

The invention is illustrated by reference to the accompanying drawings, in which

FIG. 1 shows an axial section through one embodiment of a replaceable pack in accordance with the invention;

FIG. 2 shows diagrammatically an end elevation of another embodiment of a pack in accordance with the invention, generally of rectangular form; and

FIG. 3 shows generally a fragmentary sectional front elevation of one end of the embodiment of FIG. 2, and taken along III—III,

FIG. 4 is an axial section through another embodiment of a pack according to the invention;

FIG. 5 shows a pack according to the invention in use in purifying air from a toilet bowl; and

FIG. 6 shows a pack according to the invention in use in purifying air from a bedpan.

In FIG. 1 reference numeral **10** indicates a cartridge filter pack comprising a container **12** of annular construction with inner and outer metal grid walls **14, 16,** and an end **18** through which no air can pass. The container **12** contains a battery **20,** and the remainder of the container is full of activated carbon **22.** Leads **24,** 24.1 from the battery **20** end in terminals **26, 26.1** of the press-fit stud type. A plastics head portion **28** fits over the container **12** and is moulded integrally with a pipe **30** which leads to ducts in a toilet seat. A fan (not shown) is mounted in the pipe **30.**

Leads **32, 32.1** from an electrical circuit including the fan and a switch under the toilet seat end in terminals **34, 34.1** which can be pressed into the terminals **26, 26.1.** When the electrical circuit is completed by a person's weight pressing on the toilet seat, air is sucked from the toilet along the pipe **30** and redially out through the activated carbon **22,** becoming purified in the process.

When the battery **20** has been exhausted, the head portion **28** is removed and the used cartridge filter pack **10** discarded and replaced by a new one.

Referring now to FIGS. 2 and 3 of the drawings, there is shown another pack **40** of generally rectangular form. It comprises a foraminous container **42** within which there is provided filter material **44** which may be activated carbon, and a battery **46** having terminal connections **48** and **48.1.** The pack **40** may be of metal gauze or of a moulded synthetic plastic material.

In FIG. 4, a pack shown generally at **50** comprises a cylindrical container having an outer perforated wall **52** and inner perforated wall **54.** End **56** of the container is non-perforate. The container is in two parts, namely a head part **58** and a body part **60.** The walls of the head part are solid. The body part **60** contains activated carbon **62** and a perfume substance and a battery **64.** Leads **66, 66.1** from the battery **64** end in terminals **68, 68.1.**

The head part **58** contains a fan **70** and switch **72.** The head part **58** screws on the body part **60** and, when screwed on the terminals **68, 68.1** from the battery **64** contact terminals **74, 74.1** connected to wires completing the electrical circuit containing the fan **70** and the switch **72.**

The head part **58** has a central sleeve **76** which is slideable into a pipe **78** leading to the interior of an article of sanitaryware.

In this embodiment, the switch **72** is operated when air is to be removed from the article of sanitaryware.

In FIG. **5,** the underside of a toilet seat **80** has a moulded seal **82** attached thereto. Inlets **84, 84.1** lead to duct **86** which itself leads to pipe **88** connected to a pack **90** according to the invention. A switch **92** has leads **94** to a battery **96** and fan **98** within the pack. The pack **90** easily can be removed from the pipe **88.**

In FIG. **6,** a pack **100** as illustrated in FIG. **4** has a sleeve **102** over which pipe **104** fits. The pipe **104** leads to a collector **106** from which swan-neck shaped pipes **108, 108.1** lead into a bedpan **110,** fitting under the lip **112** of the bedpan. To use the pack, the switch **114** must be operated. The pack is easily separatable to provided a head part **116** and a disposeable body part **118,** as was illustrated in FIG. **4.**

The invention enables foul air to be purified in an inexpensive manner without elaborate ducting. The pack, or a worn out part thereof can be discarded when it has been used, and replaced easily. If a toilet ventilation apparatus operates inefficiently, a housewife or cleaner need not have to decide whether it is the battery or the filter which is at fault. She merely has to replace the whole pack. The pipe may be easily removeable from the sanitaryware article.

I claim:

1. A disposable conditioning pack for use in a ventilating apparatus of a sanitary manufacture such as a toilet bowl or bedpan to condition air, said pack comprising an outer perforated casing, an inner perforated casing positioned wholly within the outer casing and forming an annular container surrounding a central air passage, a battery and an air-permeable substance that alters the odour of air passing therethrough positioned in the annular container formed between the two casings, leads extending from the battery out of one end of the casing to terminals positioned outside the casing for connection to an air displacement means for displacing air to be conditioned through the substance, the central air passage being open at the end from which the leads extend and closed at the other end, the amount of said air-permeable substance being such that, when the battery is exhausted, the odour-altering property of said substance is substantially exhausted as well.

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