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COMBINATION SELF-PROPELLED PIPE CLEANER AND SPRAY

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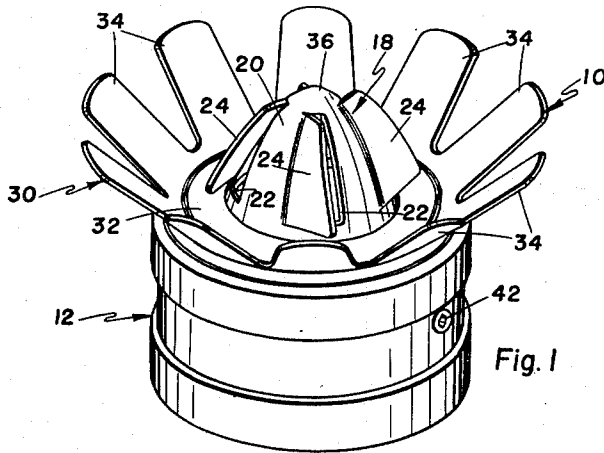


Fig. 1

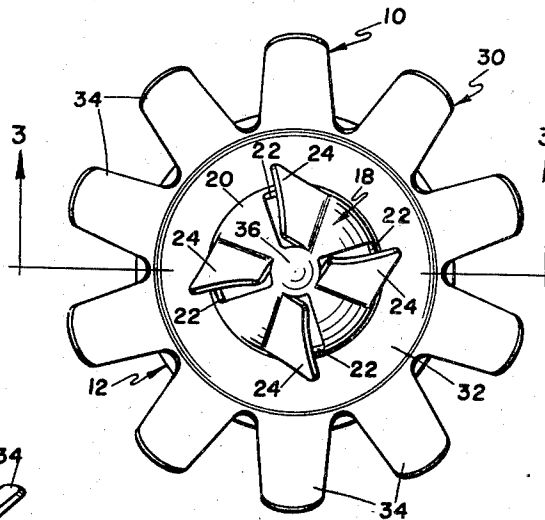


Fig. 2

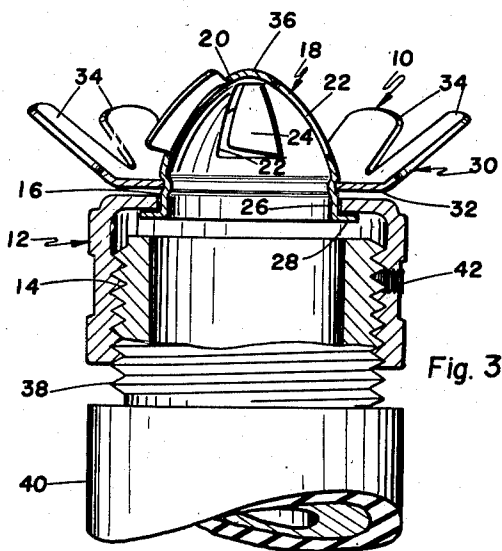


Fig. 3

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1

2,767,416

COMBINATION SELF-PROPELLED PIPE CLEANER AND SPRAY

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3 Claims. (Cl. 15—104.12)

The present invention relates generally to fluid rotated devices and more particularly to a combination fluid rotated pipe cleaner and spray.

The primary object of this invention is to provide a pipe cleaning device having an integral fluid driven rotor and cutter, the device being designed for attachment to a conventional flexible hose.

Another object of this invention is to provide a pipe cleaning device in which the rotor has a domed portion projecting ahead of the cutter to penetrate and loosen obstructions.

Another object of this invention is to provide a pipe cleaning device in which the rotor and cutter assembly may be locked to prevent rotation when not required.

Another object of this invention is to provide such a device which may also be used as a spray or sprinkler.

Another object of this invention is to provide a pipe cleaning device which is adapted for fabrication from many different materials, so that the choice of material can be according to the dictates of availability and price considerations, the exact sizes and proportions being matters easily determined to suit particular conditions and needs.

Another object of this invention is to provide a pipe cleaning device which is inexpensive and practicable to manufacture.

Finally, it is an object of this invention to provide a pipe cleaning device of the aforementioned character which is simple, safe and convenient to operate, and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions as will be hereinafter fully described in the specification, particularly pointed out in the claims and illustrated in the drawing which forms a material part of this disclosure and wherein similar characters of reference indicate similar or identical elements and portions throughout the specification and throughout the views of the drawing, and in which:

Fig. 1 is a perspective view of the combination pipe cleaner and spray.

Fig. 2 is a top plan view of the device.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2, the device being shown attached to the end of a hose for purposes of illustration.

Referring now to the drawing in detail, the device comprises a rotating assembly 10 which is freely rotatably mounted in a cap 12. The cap 12 is similar to a conventional end cap, such as used with a garden hose or the like, and has an internally screw threaded bore 14 and an axially apertured end plate portion 16.

The rotating assembly 10 includes a fluid propelled rotor 18 having a dome 20 in which are cut a plurality of longitudinal tapered slots 22. The portions of the dome 20 cut to provide the slots 22 remain attached to the dome along one edge and are bent outwardly to constitute impeller vanes 24. At the base of the dome 20 is a short barrel portion 26 which is a freely rotating

2

fit in the end aperture 16 of the cap 12, the end of said barrel portion being outwardly turned to provide a retaining flange 28 frictionally engaging the end plate portion 16 of said cap as shown in Fig. 3.

Secured to the rotor 18 around the base of the dome 20 is an annular cutter 30, comprising a disc portion 32 from which extend a plurality of radial blades 34. These blades 34 are bent forwardly to surround the dome 20, the apex 36 of said dome projecting slightly forwardly of said blades. This forward extension of the dome results, in use, in a centralized initial attack on material blocking a pipe, causing a hole to be created at the center of the mass of obstructing material, whereupon this material tends to loosen and collapse toward the center of the pipe where it is easily broken up by the revolving blades 34, and carried away by the stream of water.

The cap 12 is designed for attachment to a conventional screwed hose connection 38 such as that shown in Fig. 2, said hose connection being inserted in the end of a flexible hose indicated at 40, a standard garden hose being ideal for the purpose. To prevent detachment of the device from the hose 40, the cap 12 is provided with a set screw 42 which can be tightened against the hose connection 38.

In use, the device is attached to a water hose and inserted into the pipe to be cleaned. The device may be used to clean drainage or sewer pipes, and various other pipes which may become blocked by accumulations of debris, sludge or encrustations. When the water is turned on, the efflux of water through the slots 22 against the impeller vanes 24 causes the rotor 18 to spin, carrying with it the cutter 30. As the device cuts through the obstructions, the hose may be fed into the pipe, the extremely short length of the structure allowing the device to pass around all normal bends in the pipe.

As the device progresses through the pipe, the protruding apex 36 of the rotor 18 penetrates obstructions, the swirling action of the propellant water loosening the obstructions to assist the action of the cutter 30. It has been found in practice that the device will penetrate for considerable distances inside pipes, 40 feet or more of hose being inserted with ease.

The device may also be used to clean out non-circular pipes such as the square or rectangular downspouts used on buildings. To prevent damage to the interior of such pipes the cutter 30 may be locked against rotation. This is accomplished by screwing the cap 12 fully on to the hose connection 38, so that the retaining flange 28 is jammed tightly against the end of said hose connection.

The cap 12 is then locked in place by means of the set screw 42 to prevent rotation of the rotating assembly 10. The water emerging through the slots 22 is caused to swirl by being deflected against the vanes 24, this swirling action normally being sufficient to loosen leaves or other debris found in downspouts or the like.

In addition to its use of a pipe cleaner, the device may also be used as a spray or sprinkler. The device may be mounted on a suitable support or carried on the end of a hose, the rotating assembly 10 being allowed to spin freely. The water swirling from the vanes 24 strikes the cutter blades 34 and is broken up by the impact into fine droplets which are expended centrifugally as a spray. Thus the device may be used as a spray or a pipe cleaner without detachment from the hose or the addition of further attachments. Other functions of the device will be apparent for household use and also in the field of plumbing.

The operation of this invention will be clearly comprehended from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawing and the above recited objects. It

3

will be obvious that all said objects are amply achieved by this invention.

Further description would appear to be unnecessary.

It is understood that minor variation from the form of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawing are to be considered as merely illustrative rather than limiting.

I claim:

1. A combination pipe cleaner and spray comprising a cap for attachment to a hose and having an axially apertured end plate portion, a fluid propelled rotor freely rotatable in said cap, said rotor including a dome having a plurality of slots therein, outwardly projecting impeller vanes on said dome and disposed adjacent said slots and integral with said dome, a barrel portion extending from said dome through and rotatively mounted in said axially apertured end plate portion of the cap, a cutter secured to said rotor and having a plurality of generally radial blades, said blades having their tips in a single plane extending transversely of the axis of the rotor between said cap and the end of said dome remote from said cap.

2. A combination pipe cleaner and spray comprising a cap for attachment to a hose and having an axially apertured end plate portion, a fluid propelled rotor, said rotor including a dome having a plurality of slots therein, outwardly projecting impeller vanes adjacent said slots and integral with said dome, a barrel portion extending from said dome through and rotatively mounted in said axially apertured end plate portion of the cap,

4

a cutter secured to said rotor and having a plurality of generally radial blades, said dome protruding axially beyond said blades, said cutter having an annular disc portion from which said blades extend, said barrel portion having an outwardly extending flange, and said disc portion and flange frictionally engaging opposite sides of said axially apertured end plate portion of the cap for rotative mounting of the rotor on said cap.

3. A combination pipe cleaner and spray comprising a cap for attachment to a hose and having an axially apertured end plate portion, a fluid propelled rotor freely rotatable in said cap, said rotor including a dome having a plurality of slots therein, outwardly projecting impeller vanes adjacent said slots and integral with said dome, a barrel portion extending from said dome through and rotatively mounted in said axially apertured end plate portion of the cap, a cutter secured to said rotor and having a plurality of generally radial blades, said blades being inclined away from said cap and disposed at an acute angle relative to the axis of said rotor, and said dome protruding axially beyond said blades.

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