Dec. 17, 1968 W. R. KLEMME 3,416,514

FIREPLACE ASH REMOVER

Filed April 17, 1967 2 Sheets-Sheet 1

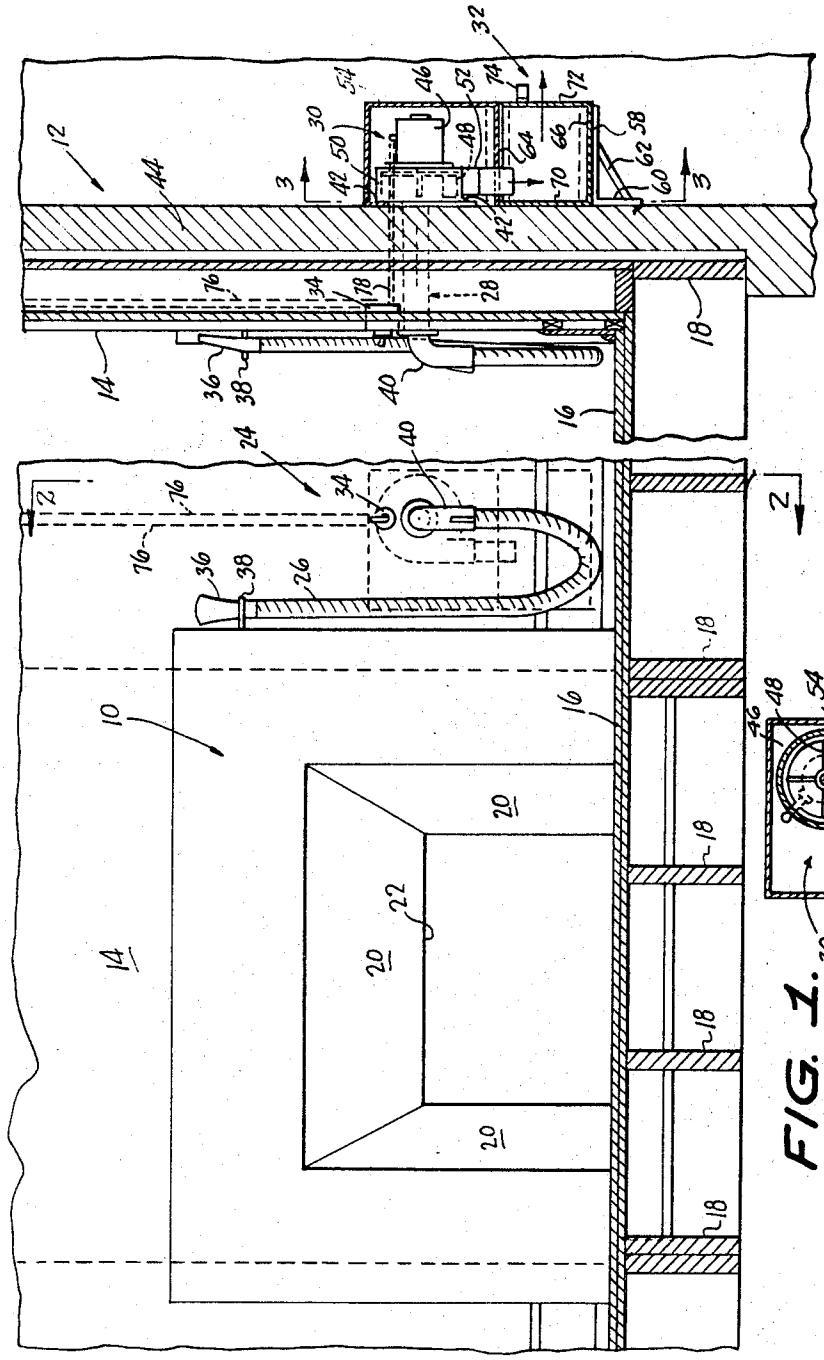


FIG. 2.

FIG. 3.

FIG. 1.

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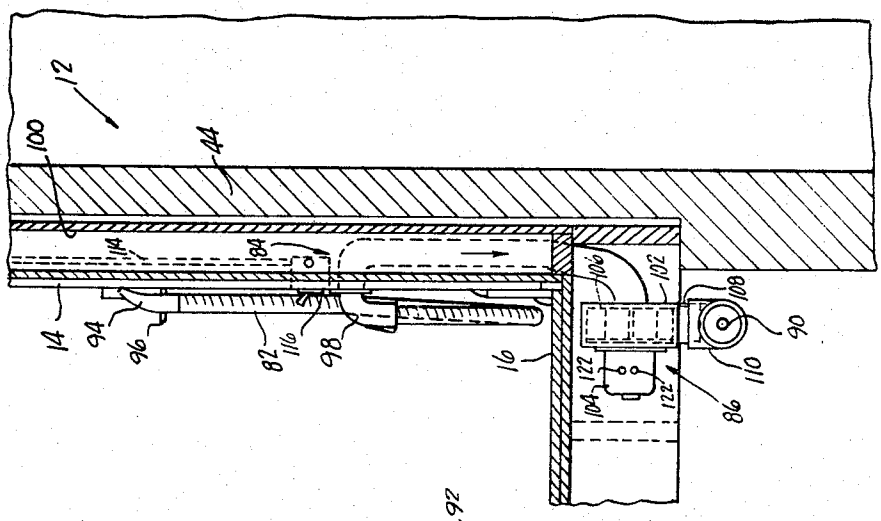


FIG. 5.

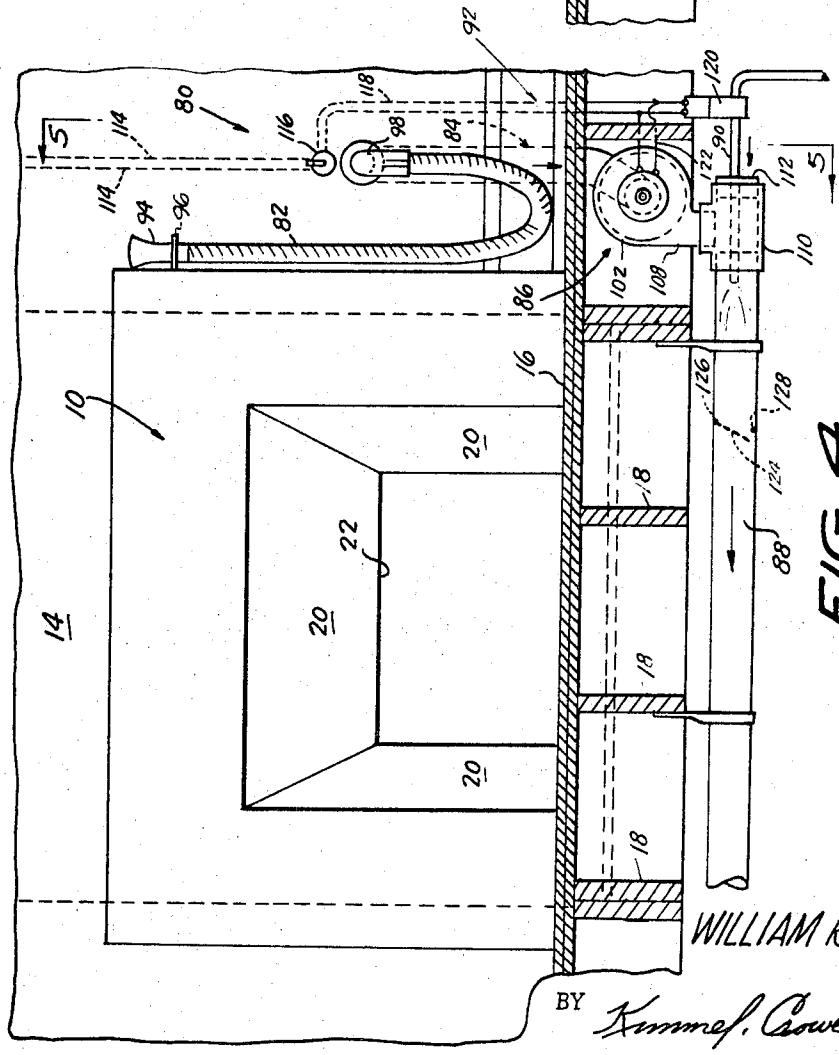


FIG. 4.

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FIREPLACE ASH REMOVER

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ABSTRACT OF THE DISCLOSURE

A vacuum blower, a flexible hose, a swivable L-connection between the blower and the hose, and a disposal receptacle, or, alternatively, a system for flushing ashes picked up by the flexible hose into a soil pipe is disclosed.

Background of the invention

This invention relates to vacuum cleaning devices and more particularly to vacuum devices for cleaning fireplaces and removing ashes therefrom.

Description of the prior art

Vacuum cleaners in general are well known in the prior art, including permanently installed vacuum cleaner systems; however, the vacuum cleaning systems of the prior art are not adapted for and do not operate well for removing large quantities of heavy particles such as ashes from fireplaces.

Summary

The present invention is directed to a vacuum type fireplace ash remover in which the removed material may be placed in a filter box receptacle exterior of the room or deposited directly in a soil line leading to a sewer. Objects of the invention include the provision of a vacuum type ash remover in which the removed ashes are forced into a soil line with a pressurized water stream to carry the particles and wash them from the soil line into the sewer. The particular combination between the vacuum line and the pressurized water source to wet the discharged particles from the outlet of the vacuum line and the particular elements and combinational features constitute further objects of the invention.

Brief description of the drawing

FIGURE 1 is a front elevational view of a fireplace adjacent which is positioned the removal means of the instant invention;

FIGURE 2 is a cross-sectional view of FIGURE 1 taken substantially along line 2—2 thereof as viewed in the direction indicated by the arrows illustrating the construction of the fireplace ash removal mechanism of the instant invention;

FIGURE 3 is a cross-sectional view of FIGURE 2 taken substantially along line 3—3 thereof as viewed in the direction indicated by the arrows illustrating the construction of the filter box positioned exteriorly of the room in which the fireplace is located;

FIGURE 4 is a front elevational view of a fireplace illustrating the fireplace ash removal means of the instant invention, certain parts being broken away to illustrate the connection between a fan inducing a vacuum in the vacuum line and the soil line acting to remove the discharged materials toward a sewer; and

FIGURE 5 is a vertical cross-sectional view of FIGURE 4 taken substantially along line 5—5 thereof as viewed in the direction indicated by the arrows.

Description of the preferred embodiments

Referring now to the drawings in detail, wherein like reference characters designate like elements throughout the several views thereof, there is indicated generally at

10 a fireplace extending through a wall shown generally at 12 having an interior facing 14 in a room provided with a floor 16 supported by a plurality of braces 18 from a foundation (not shown). Fireplace 10 includes the usual hearth formed by inwardly converging walls 20 with an outlet 22 being provided in communication with a chimney. Positioned adjacent fireplace 10 is a vacuum removal means shown generally at 24 having as its major components a flexible removable suction hose 26, a rigid inlet pipe shown generally at 28 connecting hose 26 to a fan shown generally at 30, and a filter box shown generally at 32 receiving the removed material. An electrical switch 34 is mounted upon interior facing 14 for selectively energizing fan 30 in order to draw a moving stream of air through suction hose 26 into filter box 32 exterior of the room in which fireplace 10 is located. It will be apparent that an individual may manipulate switch 34 and utilize suction hose 26 to remove the ashes from fireplace 10.

Suction hose 26 is of a conventional configuration and is provided with a suction head 36 which may be releasably mounted in a U-shaped bracket 38 affixed to facing 14. The outlet end of suction hose 26 is mounted in a removable L-shaped connector 40 swivably mounted in inlet pipe 28 with suitable gaskets (not shown) being provided to prevent the escape of dust laden air into the room in which fireplace 10 is located. It should be apparent that the swivable nature of connector 40 allows free movement of suction hose 26 obviating the crimping thereof at the junction of connector 40 and hose 26.

Fan 30 is mounted by suitable connecting means 42, such as nails, studs, bolts or the like to the exterior portion 44 of wall 12. Fan 30 includes a power source illustrated as an electric motor 46, but which may be a water powered motor, drivably interconnected with a plurality of fan blades 48 mounted within a fan housing 50 to create the suction providing the moving stream of air, carrying the fireplace ashes, into fan housing 50. Fan 30 also includes an outlet duct 52 discharging the output into filter box 32. As may be seen best in FIGURES 2 and 3, fan 30 is enclosed in a suitable housing 54 releasably mounted on filter box 32 by a pair of flanges 56 which act to slidably receive housing 54.

Filter box 32 includes a pair of spaced apart angle members 58 supporting the lower corners of filter box 32 which are in turn mounted on exterior portion 44 of wall 12 by a plate 60 secured thereto with diagonal braces 62 being provided for additional rigidity. Filter box 32 preferably includes an impervious top wall 64 through which outlet duct 52 extends, an impervious bottom wall 66, a pair of impervious side walls 68, an impervious back wall 70 and a pivotally mounted perforated front wall 72 carrying a handle 74. Front wall 72 is preferably constructed such that finer ash particles and air will pass freely therethrough, while larger ash products will accumulate in filter box 32 such that an individual may periodically empty it into a refuse container as needed. Although there will be some exhaust of dust and ash particles from filter box 32, the accumulation of larger particles therein will act as a filter to minimize greater discharge of the finer particles. In lieu of or in addition to filter box 32, a fire-proof woven mesh bag 75 may be used to filter the particulate material passing through outlet duct 52. Bag 75 can be woven or constructed of aluminum, stainless steel or other suitable fire-proof material and is of close weave preferably having on the order of 2,500 perforations per square inch.

Electrical switch 34 is interconnected between a pair of electrical wires 76 leading to a suitable power source and a pair of electrical conduits 78 leading from switch 34 to electric motor 46. When an individual desires to clean fireplace 10, he will remove suction head 36 from

bracket 38 and manipulate switch 34 to deliver electrical energy to motor 46 thereby driving fan blades 48 to induce a moving stream of air through suction head 36, flexible hose 26, connector 40, inlet pipe 28, outlet duct 52 and filter box 32 to the atmosphere exterior of the room in which fireplace 10 is located. The individual will draw suction head 36 across the floor of fireplace 10 to remove the ash material from fireplace 10 into filter box 32. It should be apparent that bracket 38 may be arranged, much like a telephone, to operate switch 34.

As the first dust and ash particles exit from outlet duct 52, they will move toward perforate front wall 72 with a substantial portion thereof exiting under the atmosphere. After a portion of fireplace 10 has been cleaned, the larger ash particles will accumulate within filter box 32 thereby acting as a self-generating filter to avoid the loss of finer particles through perforate wall 72. It will be seen, therefore, that the overall discharge of dust and ash in the atmosphere will be minimized by the self-generating features of the filter accumulating within filter box 32.

Referring now to FIGURES 4 and 5, another form of the vacuum removal means of the instant invention is shown generally at 80 in conjunction with fireplace 10, concerning which like references have been used for purposes of clarity. Vacuum removal means 80 includes a flexible suction hose 82, a rigid inlet pipe shown generally at 84 connecting suction hose 82 to a fan shown generally at 86 positioned under floor 16. As will be explained more fully hereinafter, fan 86 discharges into a soil line 88 with a pressurized water line 90 being arranged to wet the ash and dust particles emitting from fan 86. An electrical control system shown generally at 92 is provided for simultaneously actuating fan 86 and delivering water through water line 90.

Suction hose 82 is of conventional configuration and carries a suction head 94 on the inlet end thereof which may be placed, for purposes of storage, in a U-shaped bracket or holder 96 affixed to wall 12. It should be apparent that hose 82 may be removed when not in use and stored in a remote location. The outlet end of suction hose 82 is received in an L-shaped connector 98 swivably mounted in the inlet of rigid pipe 84. Pipe 84 extends downwardly through the space between interior facing 14 and partition wall 100 through floor 16 to the inlet formed in fan housing 102 of fan 86.

Fan 86 includes a power source, illustrated as an electric motor 104 but which may be a water powered motor, operatively connected with a plurality of fan blades 106 mounted within fan housing 102 and arranged to create a suction inducing a moving stream of air through flexible hose 82 and rigid inlet pipe 84. Fan housing 102 forms an outlet 108 in fluid communication with the branch outlet of a T 110 in fluid exchanging relation with soil pipe 88 as seen best in FIGURE 4. Pressurized water line 90 extends through a plug 112 in the inlet of T 110 such that the discharge through fan outlet 108 is substantially perpendicular to a discharge from water line 90 and perpendicular to the resultant flow of material through soil line 88. It has been found that the change of direction required of the dust and ash particles in connection with the water spray emitted from water line 90 results in an efficient wetting of the dust and ash particles. A check valve 124 is hinged at 126 for opening conduit 88 upon the passage of material toward the sewer. A stop 128 prevents flapper 124 from moving in the opposite direction to preclude the return of sewer gases along pipe 88.

Electrical system 92 includes a pair of electrical wires 114 leading from a suitable power source to a switch 116 positioned adjacent connector 98 within the room in which fireplace 10 is located. A second pair of wires 118 leads from switch 116 to a solenoid operated valve 120 positioned in water line 90. A pair of branch wires 122 place electric motor 104 in parallel with solenoid valve 120 such that the actuation of switch 116 opens valve 120 to deliver a stream of water within T 110 and simultaneously energizes electric motor 104 to commence the flowing of an ash and dust laden stream of air through vacuum removal means 80.

In the event that a water powered motor is used, the actuated solenoid will open a valve delivering pressurized water to the motor to rotate blades 106. The water will then be directed through conduit 90 into mixing T 110.

It should be apparent that the diversion of the moving stream of air 90° by T 110 creates a great deal of turbulence therein thus providing an efficient wetting environment in which water from water pressurized line 90 is sprayed. In addition, it has been found that the introduction of water at 90° with respect to the outlet directional flow enhances the wetting of the dust and ash particles thereby further facilitating their movement through soil line 88 and the sewer with which it is in communication.

It is now seen that there is herein provided an improved fireplace ash remover which accomplishes all of the objects and advantages of the instant invention and others, including many advantages of great practical utility and commercial importance.

I claim:

1. A fireplace ash remover comprising:
- a flexible suction hose for gathering the ash and dust particles from a fireplace;
- an L-shaped connection, on the outlet end of the suction hose;
- a stationary pipe, adapted to extend through an interior wall of a room in which the fireplace is located, the L-shaped connection being swivably mounted in fluid communication with the stationary pipe;
- a suction fan, adapted to be mounted exteriorly of the room, having an inlet in fluid communication with the stationary pipe;
- means in communication with the outlet of the suction fan for discharging at least a part of the ash and dust particles to a location remote from the fan, said means including a soil line for receiving and transporting the dirt and ash particles to a sewer;
- a three-way connection placing the soil line in communication with the fan outlet;
- a pressurized water line in communication with the three-way connection for wetting the dust and ash particles discharged by the fan outlet; and
- a check valve, in the soil line, for preventing backflow of sewage gases.

2. The fireplace ash remover of claim 1 wherein the three-way connection forms a pair of aligned openings, the soil line being connected to one of the openings, the water line being connected to the other opening.

3. The fireplace ash remover of claim 2 wherein the three-way connection includes an aperture at substantially 90° with respect to the openings, the fan outlet being in communication with the aperture.

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