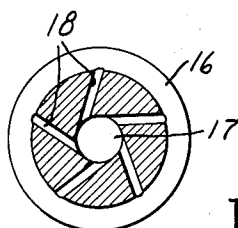
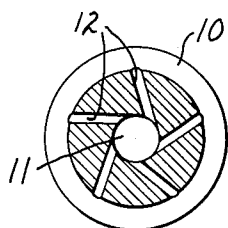
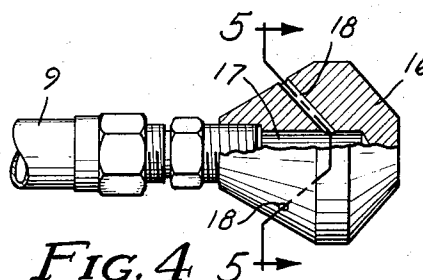
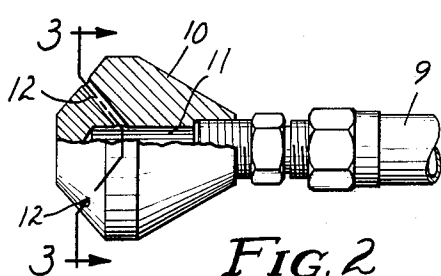
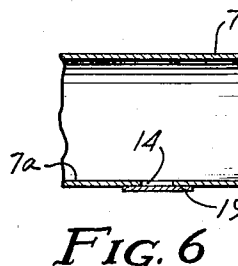


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METHOD OF CLEANING HOT AIR FURNACES AND DUCT
SYSTEMS ASSOCIATED THEREWITH
Filed Sept. 27, 1963

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3,215,560

METHOD OF CLEANING HOT AIR FURNACES AND DUCT SYSTEMS ASSOCIATED THEREWITH

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Filed Sept. 27, 1963, Ser. No. 312,023

2 Claims. (Cl. 134—21)

My invention relates to method and apparatus for cleaning hot air furnaces and duct systems associated therewith.

In furnace duct cleaning methods heretofore developed and/or presently in use, it is virtually impossible to efficiently and thoroughly clean all the ducts in a given system.

The primary object of my invention is the provision of a novel method whereby the interior walls of the entire duct system, including the most inaccessible portions, may be quickly and efficiently freed of all accumulated dust and other foreign matter.

A further object of my invention is the provision of a method, as above described, wherein all of the dust and foreign matter from the walls of a given duct system is caused to pass through the plenum of the associated furnace to a source of vacuum, whereby to minimize contamination of the space heated by said system during the cleaning operation.

A further object of my invention is the provision of a method, as above described, which may be practiced with a minimum of equipment and with a minimum of skill and training.

The above and still further objects of my invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings, wherein like characters indicate like parts throughout the several views:

FIG. 1 is a diagrammatic view of a conventional hot air heating system in a building structure, some portions thereof being broken away and some portions thereof being shown in section;

FIG. 2 is a fragmentary view in side elevation of one form of air pressure nozzle utilizable in my novel method;

FIG. 3 is a view in section taken substantially on the line 3—3 of FIG. 2;

FIG. 4 is a view corresponding to FIG. 2, but showing a slightly modified form of apparatus utilizable in the practice of my method;

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4; and

FIG. 6 is a fragmentary view in vertical section of the portion of the duct work shown in FIG. 1 and illustrating a step in the carrying out of my novel method.

Referring with greater particularity to the drawings, the letter A indicates in its entirety a dwelling or other building, the walls 1 of which encompass a space B to be heated by a conventional hot air furnace identified in its entirety by 2. Furnace 2 includes the central combustion chamber 3 and a spaced housing 4 which defines a plenum 5 about the combustion chamber 3. The door to the furnace 2 is identified by 6, whereas the single heating duct shown bears the numeral 7.

In accordance with my invention the door 6 of the furnace 2 is first connected to a remote source of vacuum, not shown. In practice this vacuum source might well be positioned on a truck or other vehicle which could be readily moved from place to place, as desired. In any event, the duct leading from the furnace 2 to the source of vacuum is identified at 8.

Communicating with a source of air under pressure, preferably between 150 and 200 pounds, is a flexible hose 9. While the location of the apparatus producing

the air under pressure forms no part of the instant invention, it might here be stated that same, for convenience, might well be positioned on the same vehicle bearing source of vacuum.

In FIGS. 2 and 3 I have shown a nozzle 10 adapted to be screw-threaded on the outer end of the flexible hose 9. It will be noted that in this nozzle the axial passage 11 communicates with a plurality of circumferentially spaced radially outwardly and axially forwardly extending restricted ports 12. Preferably, and as shown in FIG. 3, the outlet ports 12 open tangentially into the passage 11 in the nozzle 10. This arrangement is designed to and does impart to the stream of air under pressure passing therethrough a swirling motion, as the nozzle 10 passes through the duct 7, which assures impingement of the stream against the entire inner wall surface 7a of the duct 7.

Nozzle 10 is designed for use under conditions which permit passage of same and the flexible hose 9 from a position remote from the furnace 2 toward the plenum 5. This may be accomplished by inserting the same through a register 13 and pushing the same in the direction of the plenum 5 while the air under pressure is caused to be discharged from the ports 12, or alternatively, by making an opening 14 in the duct 7, as indicated in FIGS. 1 and 6, and thereafter inserting the nozzle 10 and hose 9 through said opening 14 in the direction of the plenum 5, see particularly the dotted lines shown in FIG. 1.

Under conditions which do not normally permit insertion of the flexible hose 9 in the duct 7 adjacent its remote end 15, the nozzle 16 shown in FIGS. 4 and 5 is utilized. It will be noted that in this nozzle the axial passage 17 terminates in circumferentially spaced generally radially outwardly and rearwardly extended discharge ports 18 which, as shown in FIG. 5, are likewise tangentially positioned so as to impart a swirling movement to air under pressure passing therethrough. With this arrangement the nozzle 16 and flexible hose 9 are inserted through the opening 14 and forced to a point adjacent the remote end 15 of the duct 7, at which point the air under pressure is caused to pass through the nozzle 16 and the hose and nozzle are progressively moved in the direction of the plenum and finally out through the passage 14.

Irrespective of whether the nozzle 10 or 16 is utilized, it should be obvious that the pressure emanating from the discharge ports 12, 18 is discharged angularly in the direction of movement toward the plenum 5.

After completion of the cleaning operation any opening, such as the opening 14 formed in the duct system, may be readily closed by any suitable means such as pressure-sensitive tape 19.

My invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the above objects, and while I have shown a preferred embodiment thereof, I wish it to be understood that same may be capable of modification without departure from the scope and spirit of the appended claims.

What is claimed is:

1. A method of removing dust and accumulated foreign matter from the plenum and the duct of a hot air furnace system, said duct leading from said plenum to a space to be heated, comprising:

- (a) forming an opening in said duct intermediate said plenum and the remote end of said duct,
- (b) feeding into said duct through said opening and passing axially through said duct in the direction of said remote end a flexible, high-pressure air hose terminating in a nozzle having an axial bore,
- (c) pumping a fluid consisting of air under pressure through said hose to said nozzle,
- (d) ejecting a plurality of streams of air from said

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- nozzle in the form of circumferentially, equally spaced projecting jets around said nozzle with each jet directed tangentially and generally rearwardly from the axis of said bore to discharge said plurality of streams of air against the interior of the duct in the direction of said furnace with a swirling motion having components along the duct toward said furnace and tangentially around the interior of the duct, to dislodge the dust and foreign matter therefrom, (e) and, simultaneously, applying a vacuum to the furnace to draw said air containing said dislodged dust and foreign matter through said duct and said plenum and to discharge said air containing said dislodged dust and foreign matter to a collecting station, (f) and withdrawing said hose and nozzle from said duct through said opening.
2. The method of claim 1 comprising;
- (a) subsequently feeding into said duct through said opening and passing axially through said duct in the direction of said plenum a flexible high-pressure air hose terminating in a second nozzle having an axial bore,
- (b) pumping a fluid consisting of air under pressure through said hose to said second nozzle,
- (c) ejecting a plurality of streams of air from said second nozzle in the form of circumferentially, equally spaced projecting jets around said second nozzle with each jet directed tangentially and generally forwardly

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- from the axis of said bore to discharge said plurality of streams of air against the interior of the duct in the direction of said furnace with a swirling motion having components along the duct toward said furnace and tangentially around the interior of the duct to dislodge the dust and foreign matter therefrom, (d) and, simultaneously, applying a vacuum to the furnace to draw said air containing said dislodged dust and foreign matter through said duct and said plenum and to discharge said air containing said dislodged dust and foreign matter to a collecting station, (e) and withdrawing said hose and nozzle from said duct through said opening, (f) and capping said opening.

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