US 20020022449A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0022449 A1**

Beaini (43) **Pub. Date: Feb. 21, 2002**

(54) **STATIC HEAT RECOVERY VENTILATION SYSTEM**

(76) Inventor: **Peter J. Beaini**, Bedford (CA)

Correspondence Address:
MARIO D. THERIAULT
1133 REGENT STREET, SUITE 105
FREDERICTON, NB E3B 3Z2 (CA)

(21) Appl. No.: **09/832,134**

(22) Filed: **Apr. 11, 2001**

(30) **Foreign Application Priority Data**

Apr. 18, 2000 (CA) 2,306,022

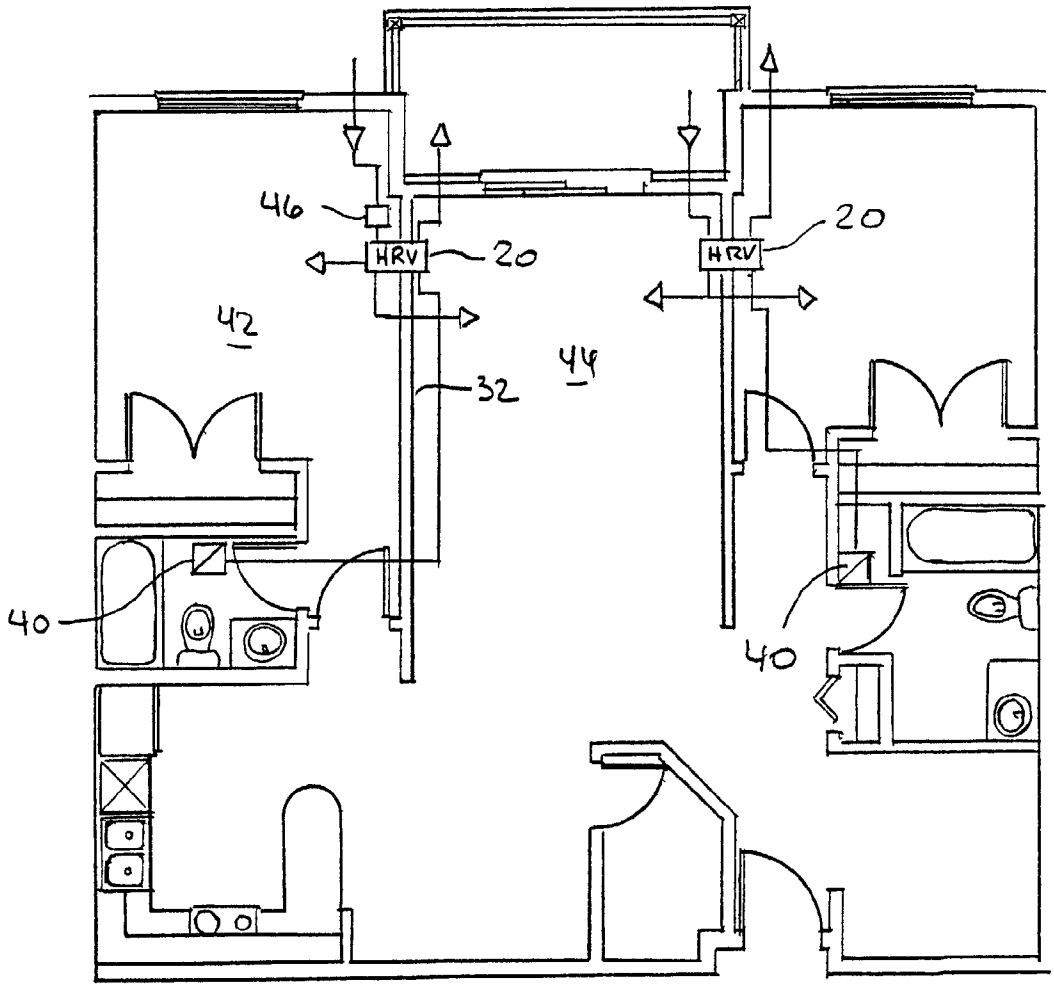
Publication Classification

(51) **Int. Cl.**[7] **F24F 7/007**

(52) **U.S. Cl.** **454/253**

(57) **ABSTRACT**

The static heat recovery ventilation system exchanges heat, through a heat pipe heat exchanger, between stale air exhausted from a house or an apartment and the fresh air intake into the house or the apartment In a first aspect of the invention, the static heat recovery system uses a negative pressure generated by exhaust equipment inside the house or apartment, such as a bathroom fan or a range hood fan, to induce an entry of fresh air through the heat exchanger and into the house or apartment. In another aspect of the invention, the static heat recovery system uses a positive pressure in the hallway of an apartment building to induce an entry of fresh air through the heat exchanger and into a suite of apartments.



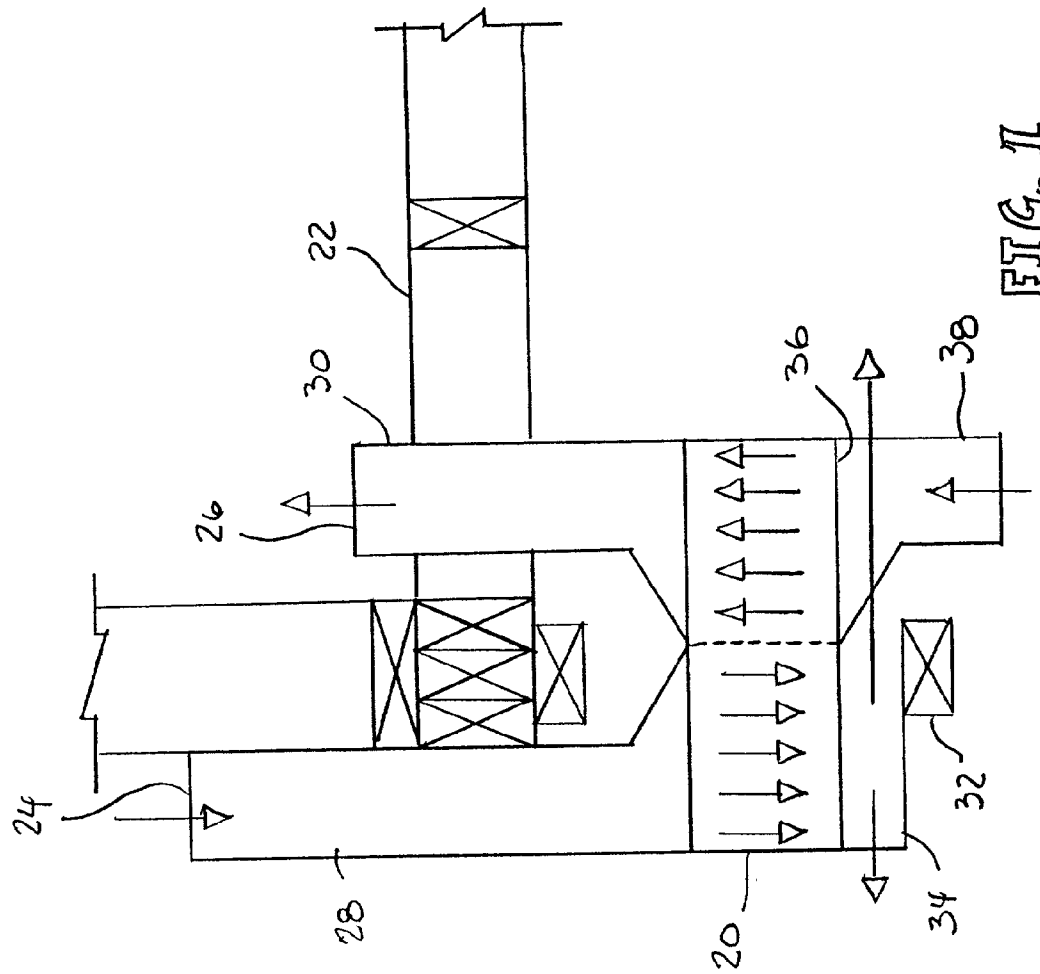


FIG. 1

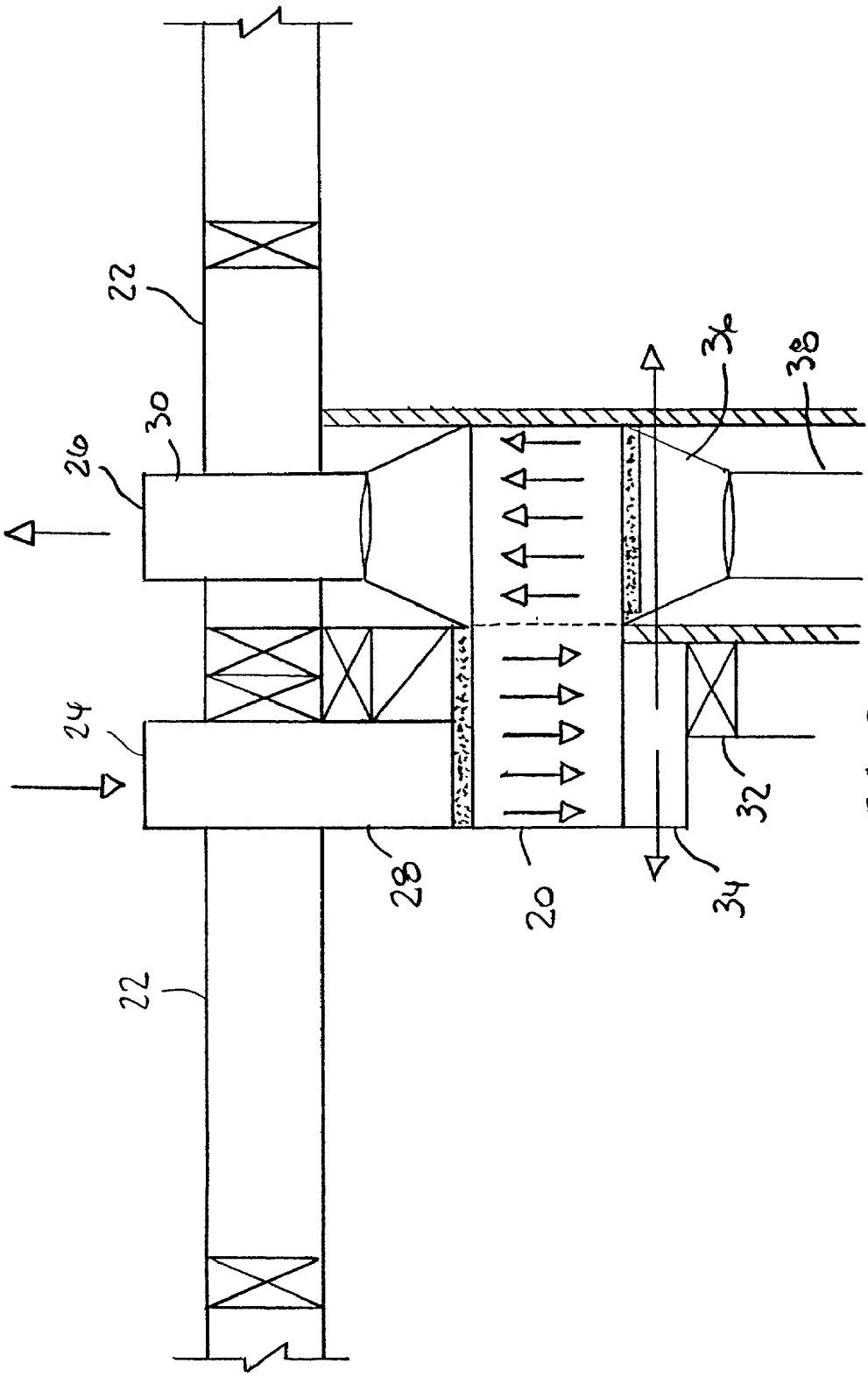
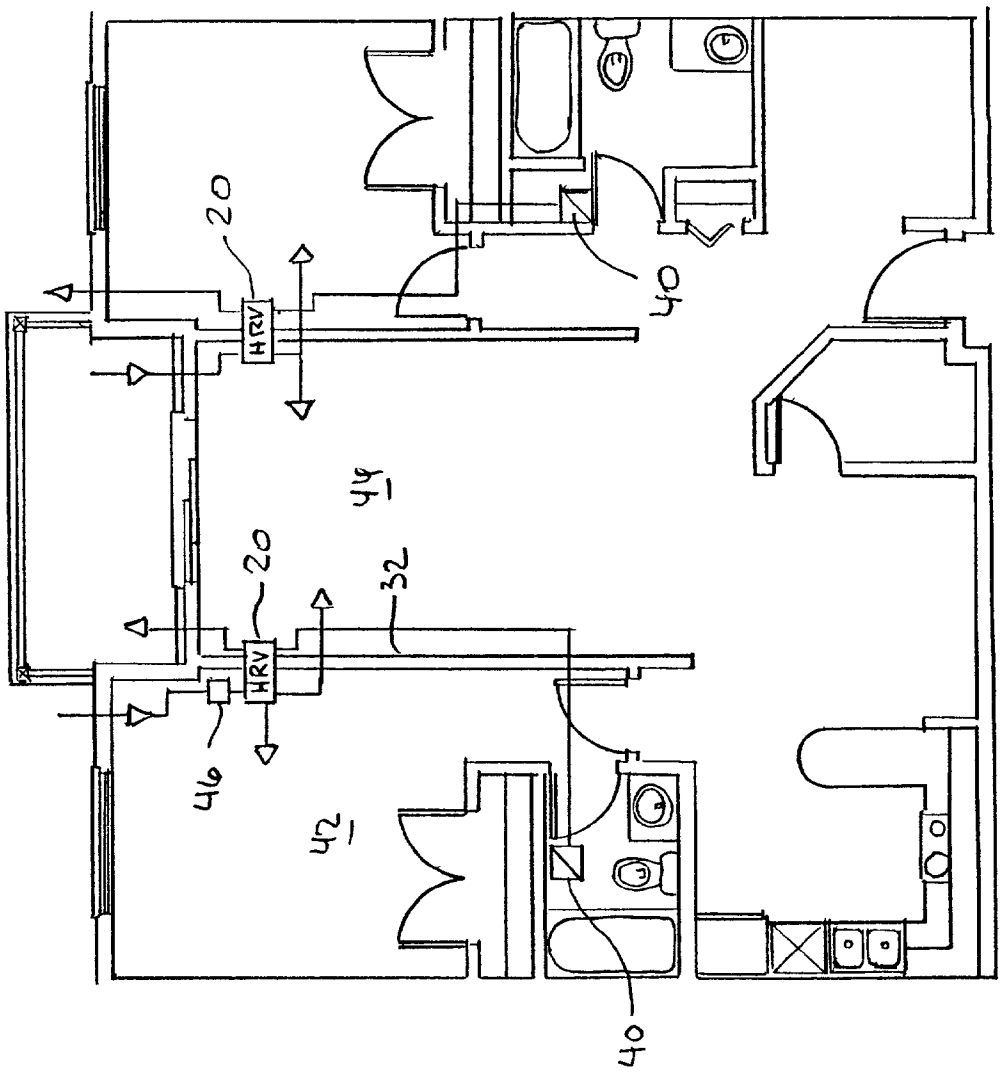


FIG. 2

FIG. 3



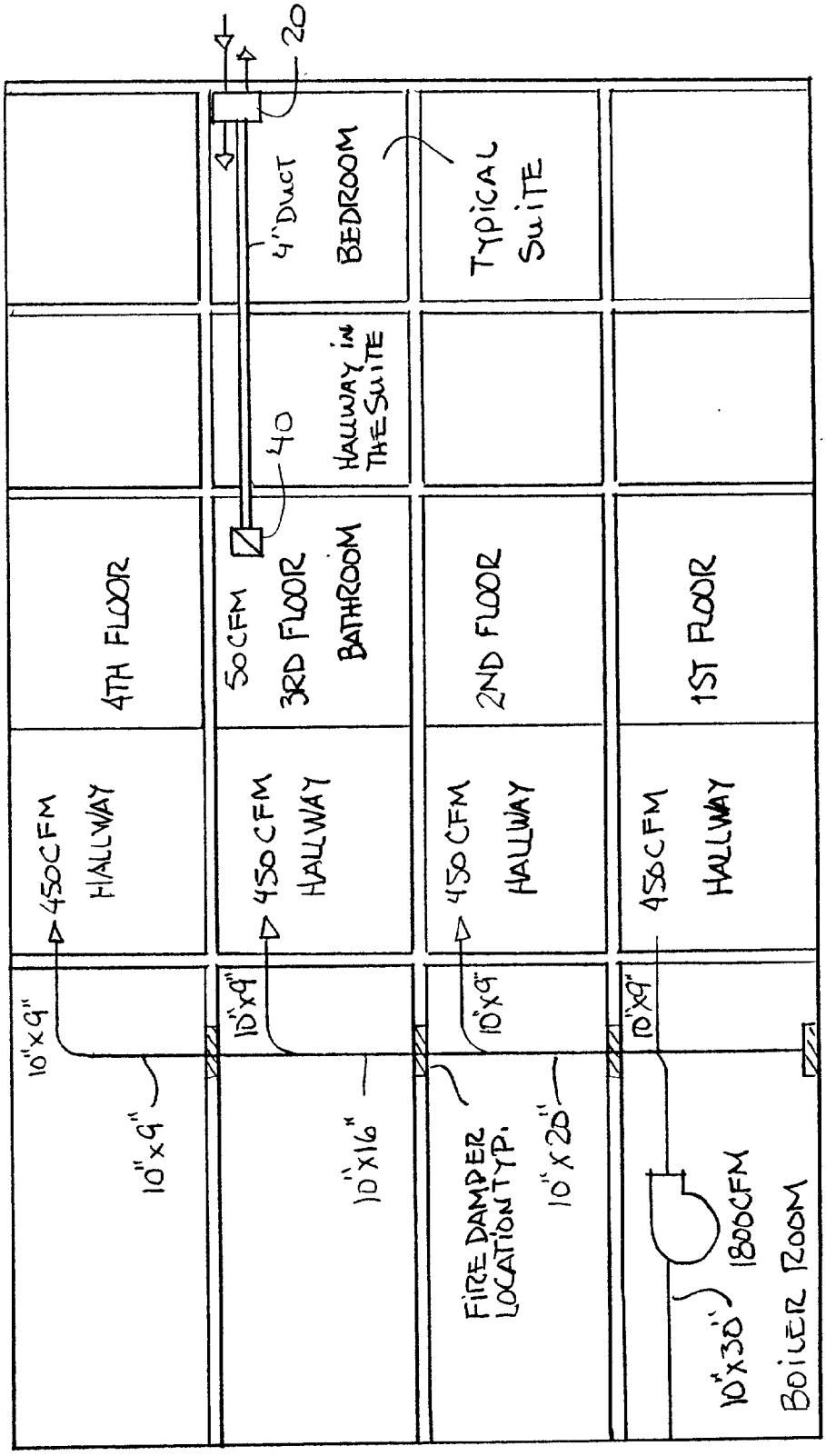

20
4" DUCT
BEDROOM
TYPICAL SUITE
HALLWAY IN THE SUITE
40
50 CFM
3RD FLOOR BATHROOM
4TH FLOOR
2ND FLOOR
1ST FLOOR
450 CFM HALLWAY
450 CFM HALLWAY
450 CFM HALLWAY
450 CFM HALLWAY
10"x9"
10"x9"
10"x16"
10"x9"
10"x9"
10"x9"
10"x9"
FIRE DAMPER LOCATION TYP.
10"x20"
10"x30"
1800 CFM
BOILER ROOM

FIG. 4

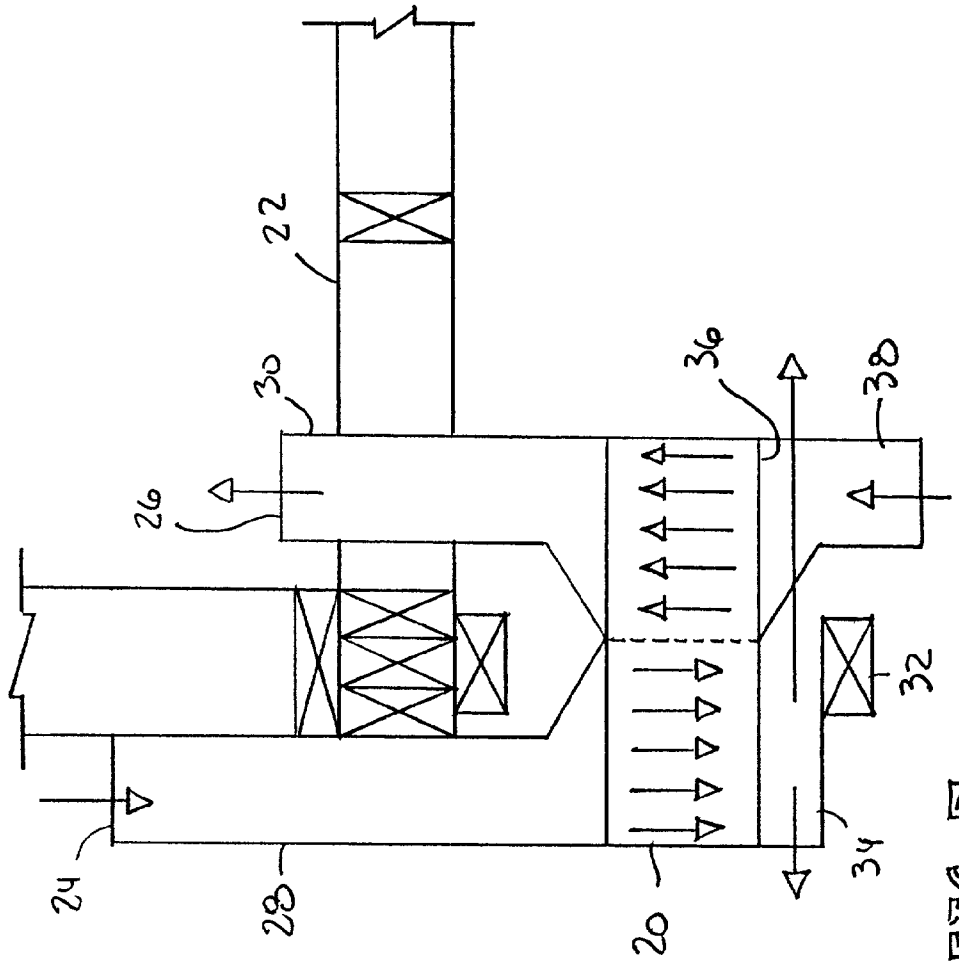
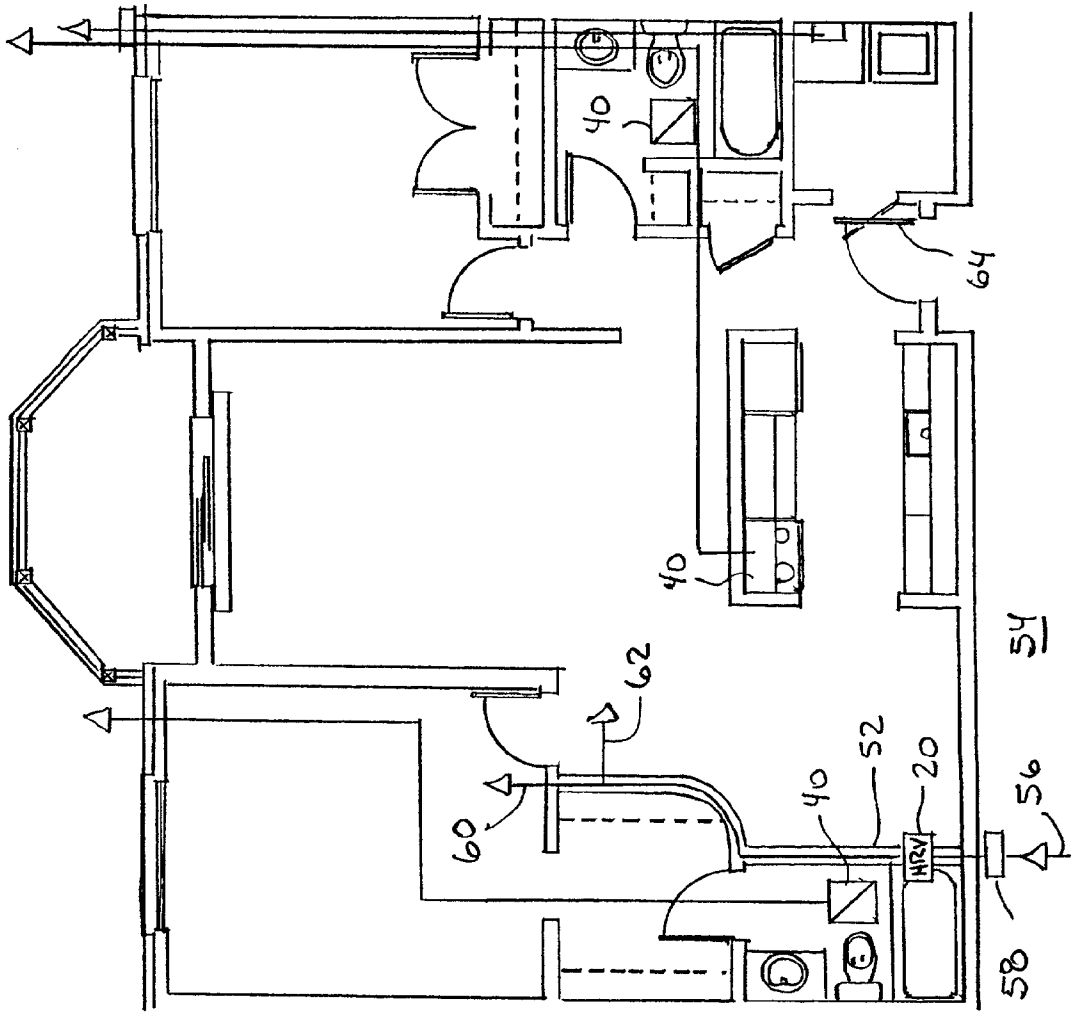


FIG. 5

FIG. 6



STATIC HEAT RECOVERY VENTILATION SYSTEM

FIELD OF THE INVENTION

[0001] This invention pertains to heat recovery ventilation systems and more particularly it pertains to heat recovery ventilation systems having no moving parts.

BACKGROUND OF THE INVENTION

[0002] The lack of trade coordination during the construction of a building and the numerous duct and piping systems involved in a building could create a safety issue whereas the presence of the duct could block some of the sprinkler heads. These problems are often caused by the ducts of a ventilation system.

SUMMARY OF THE INVENTION

[0003] As a result of the experience of the inventor in this field, an innovative method has been developed to eliminate this safety issue. The heat recovery ventilation system according to the present invention does not use any dedicated fans and the duct work therefor is kept minimum.

[0004] The heat recovery ventilation system according to the present invention exchanges heat between stale air exhausted from a house or an apartment and the fresh air intake into the house or the apartment The heat recovery ventilation system according to the present invention uses the heat pipe technology which exchanges heat a thousand times faster than the standard copper pipe technology or the plate type heat exchanger.

[0005] In accordance with a first aspect of the present invention, the heat recovery system uses a negative pressure generated by compulsory equipment inside the house or apartment to induce an entry of fresh air through the heat exchanger and into the house or apartment.

[0006] In another aspect of the present invention, the heat recovery system uses a positive pressure in the hallway of an apartment building to induce an entry of fresh air through the heat exchanger and into a suite of apartments.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0007] Modern houses and apartment buildings are constructed so that they are well insulated to prevent heat loss, and have vapor barriers to prevent the infiltration of humidity inside the walls. The insulation and vapor barrier arrangement of modern houses and suites of apartments is often referred to as R2000™. To a certain extent, the modern houses and suites of apartments are airtight. This is the type of houses and suites of apartments in which the heat recovery ventilation system according to the present invention is preferably installed.

[0008] In the first preferred installation, as illustrated in **FIGS. 2 and 3** in particular, a heat exchanger **20** is installed as close as possible to the exterior wall **22** of a house or a suite of apartments. The fresh air intake **24** and the stale air outlet **26** of the heat exchanger are connected to the outdoors by means of short ducts **28**, **30** passing through the exterior wall **22**. In the first preferred installation, the heat exchanger **20** is mounted through a partition wall **32** with the fresh air outlet port **34** extending on both sides of the partition wall. The stale air intake **36** of the heat exchanger is connected to a duct **38** extending to the bathroom exhaust fan **40** or the range hood fan.

[0009] The method of operation of the system consists of operating the bathroom fan **40** or the range hood fan to create a negative pressure inside the house or suite of the apartments. The preferred negative pressure is expressed as an external static pressure differential (EPS) with an inside pressure being lower than an outside pressure. The preferred EPS to operate the system is about 5 pascal in a house or a suite of apartments which has a chimney and burning equipment connected to that chimney. The preferred EPS to operate the system in a house or a suite of apartments that has no chimney is about 20 pascal.

[0010] It has been found that these negative pressures are sufficient to cause a circulation of fresh air from the outdoors, through the heat exchanger and inside the house or suite of apartments. It has been found that the negative pressures can induce an intake of fresh air through the heat exchanger which is sufficient to meet the health and safety requirements applicable to residential dwellings.

[0011] In the first preferred installation, the partition wall **32** though which the heat exchanger **20** is installed is a wall separating a bedroom **42** and a livingroom **44**. Also in the first preferred installation, an air heater **46** may also be installed in the fresh air intake duct **28** to pre-heat the fresh air before the fresh air is introduced into the house or the suite of apartments. The bathroom fan **40** is preferably of a type which is noiseless, which is rated for a continuous operation, and which has a capacity of 50 CFM or more.

[0012] In a second preferred installation, as illustrated in **FIG. 6**, the heat exchanger **20** is mounted in a partition wall **52** adjacent a hallway **54** separating two suites of apartments. The fresh air inlet **56** of the heat exchanger **20** extends into the hallway **54**, and includes a fire damper **58**, as required by safety regulations. The hallway **54** is pressurized with fresh air from the outdoors, to generate a flow of fresh air through the heat exchanger **20** and into a bedroom **60** and livingroom **62**. The main entrance door **64** to the suite of apartments has air seals to promote the flow of fresh air through the heat exchanger **20**. In this second preferred installation, the stale air in the suite of apartments is also evacuated by the bathroom fan **40**, or the range hood fan.

I claim:

1. A method for ventilating a suite of apartments having an exterior wall and a bathroom and an exhaust fan in said bathroom, said method comprising the steps of:

providing a heat exchanger inside said suite of apartments, said heat exchanger having a fresh air inlet and a stale air outlet extending through said exterior wall, a fresh air outlet communicating with an inside space in said suite of apartments, and a stale air inlet connected to an outlet of said exhaust fan in said bathroom;

using said bathroom fan, causing a negative pressure inside said suite of apartments and in said fresh air outlet, and

causing an air circulation through said heat exchanger from said fresh air inlet to said fresh air outlet and into said suite of apartments.

2. The method as claimed in claim 1, wherein said negative pressure is an EPS differential of about 20 pascal.

3. The method as claimed in claim 1, further comprising the step of simultaneously discharging fresh air from said fresh air outlet into two adjacent rooms in said suite of apartments.

* * * * *