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(56) Documents Cited:
WO 2010/104757 A2
CN 203615609 U
US 8091372 B1
KR 1020130020175
CN 204063671 U
US 8997509 B1

(58) Field of Search:
Other: **WPI, EPODOC**

(54) Title of the Invention: **The planet saver**
Abstract Title: **Heat exchange device for heating a building**

(57) A heat exchange system whereby heat is extracted from air outside of a building and transferred inside a building to supply heating or hot water, as in an air source heat pump. The system comprises a first radiator 3 situated outside the building and a second radiator 4 situated inside the building, separated by the outer wall 1. Pipes 5 connect the two radiators via a hole 2 in the wall. The pipes carry a coolant circulated by a pump 6. A fan 7 is mounted near the internal radiator and a second fan 8 mounted near the external radiator to circulate the hot and cool air respectively. There are temperature sensing units 9, 10, and air flow detectors 11, 12, and a thermostat 15, all connected to a central processing unit 13 with control panel 14. A heating element 16 may be used to defrost the outside radiator. An alternative defrosting mechanism is a water sprinkling system 19. In one embodiment there is a solar panel 17 on the roof of the building and an energy storage cell 18.

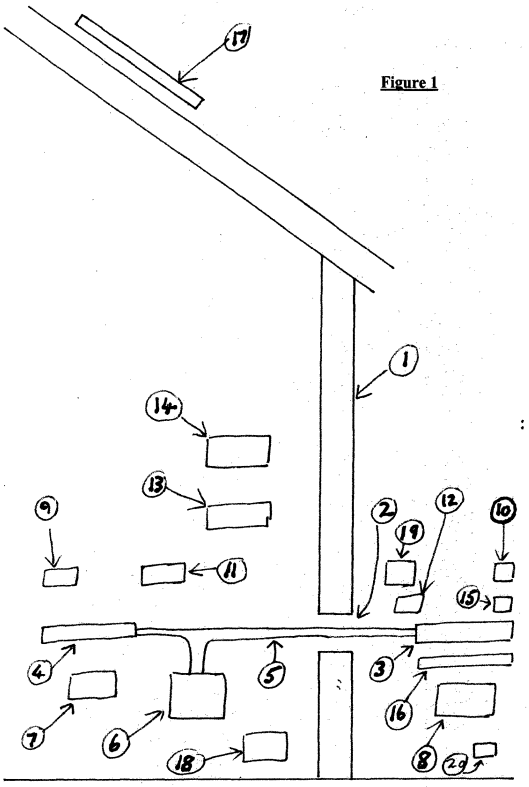

Figure 1

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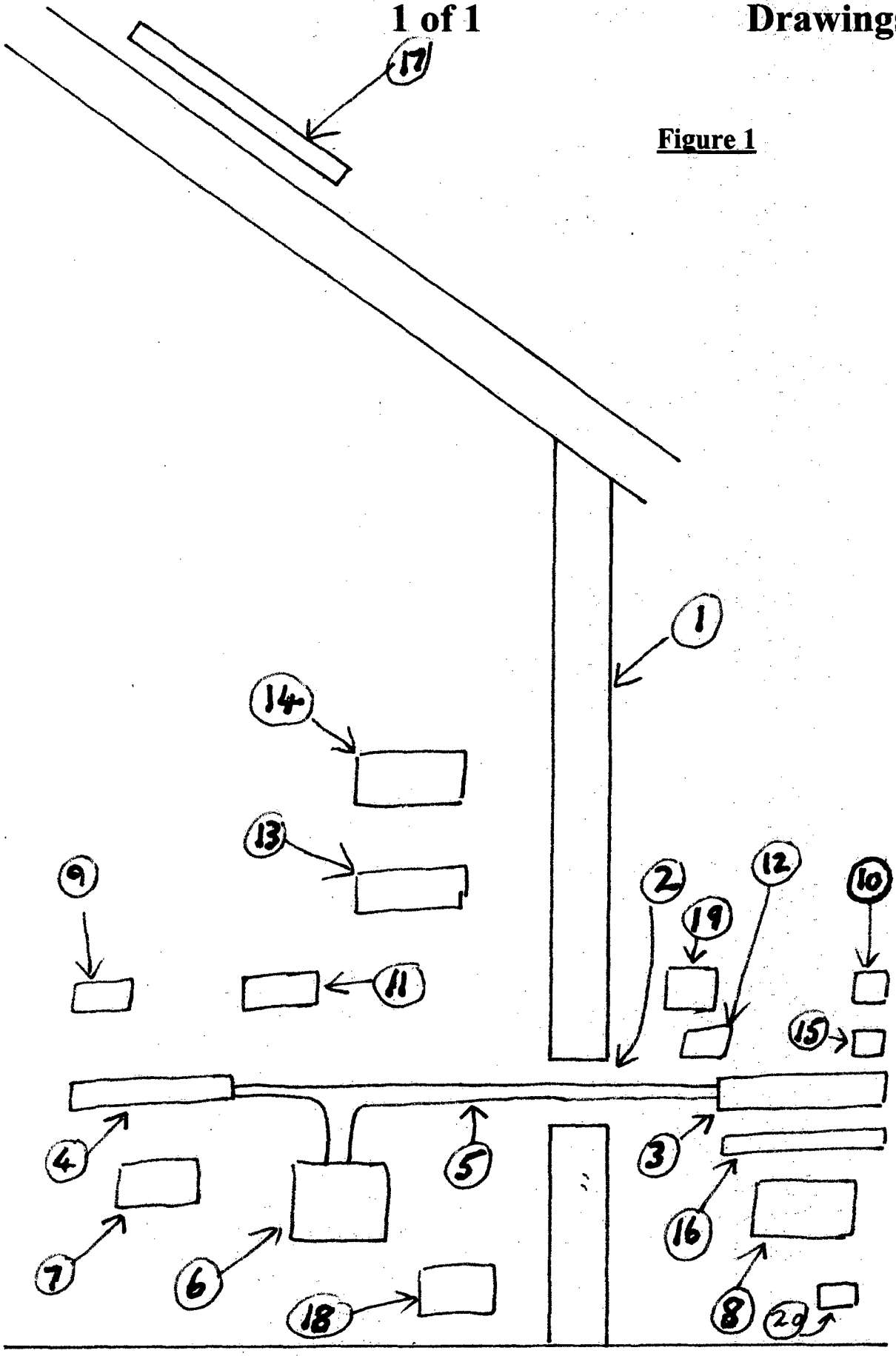
Drawings

Figure 1



1 Description

Title:

The Planet saver

Background:

There is growing concern in the UK about the rising cost of fuel for heating and hot water. There is also worldwide concern about the problem of global warming.

Statement of invention:

The invention relates to a process of providing heat without burning any fossil fuels. It is a system whereby heat is extracted from the air outside a building and transferred into the interior of the building. There is an optional extra to use light and water in the process so further reducing the burning of fossil fuels. It is a system of heat transfer and not heat generation, and can therefore make a large contribution to the 2 issues stated above.

Advantages:

1 The system has extremely low running costs.

2 This method of heat transfer can contribute to solving the problem of global warming.

3 If the invention was used worldwide, it is quite possible that it would halt global warming.

4 The system can be incorporated on a larger scale to be used to supply power for factories.

5 A number of components used in this invention are already in production in large quantities.

Detailed description:

(a) Construction:

Figure 1 shows a basic installation as a cross-section of the outer wall (1) of a building. A hole (2) of about 2 inches diameter has already been drilled through this wall (1). Various pipes and cables will pass through this hole.

A "cold" radiator (3) is mounted horizontally outside the building, and a "warm" radiator (4) is mounted inside the building. These are joined together with connecting pipes, (5), and to a circulating pump (6), so that when the pump operates and circulates a coolant under pressure within the pipes, the external radiator cools and the internal radiator one heats up.

A fan (7) is mounted near the internal radiator to circulate the hot air. A fan (8) is mounted outside by the cold radiator so that cooled air is removed from the cold radiator. Temperature sensing units (9) and (10) are placed in the output airflow of both radiators. Similarly, two air flow detectors (11) and (12) are installed.

All units (6) to (12) inclusive are connected to a central processing unit, CPU, (13). This in turn is connected to a diagnostics and control panel (14). For the sake of clarity, electric cables are not shown in Figure 1, only pipes. The system is completed by the addition of a thermostat (15) placed close to the outside radiator, and a small heating element (16) around the radiator.

(b) Practical Operation:

The system is connected to a suitable electricity supply, and switched on at the control panel. The desired internal room temperature is also set at the control panel. Then it will run automatically. If a fault is detected, a suitable warning will be given, and, depending on the type of fault, will be automatically closed down.

(c) Theory of Operation:

The whole operation is controlled by the CPU. When activated, the circulating pump is switched on, and the coolant circulates. The outside radiator becomes cold, and the internal radiator heats up. Subsequently, an internal fan is switched on to circulate the hot air around the room. The external fan switches on later, according to the readings of the temperature sensing devices.

When the system has been operating for some days, it is possible that a build-up of ice can occur on the outside radiator. This is detected by the thermostat. The build-up of ice reduces efficiency, and so the small defrost heater is activated to defrost the radiator.

(d) More advanced designs:

The model described above uses mains electricity to drive the circulating pump and defrost heater, as well as the CPU. The efficiency of the system can be improved by adding the following modifications:

1 Incorporating a solar panel (17) on the roof, and a storage cell or battery (18), inside the building.

2 Incorporating a water sprinkling system (19), directed towards the outside radiator. This can be used instead of, or in addition to, the defrost heater. The water supply can be obtained from the mains water supply or from a rainwater collection tank, or both. The CPU will be able to determine which one to use by taking a reading from a water level sensor (20) inside the collection tank.

4 Claims

1 A heat transfer system whereby heat is extracted from air outside a building and transferred for use inside a building to supply heating, hot water or both.

2 A heat transfer system as specified in claim 1 above, additionally incorporating a water sprinkling system on the external radiator to defrost the outside radiator more efficiently.

Intellectual Property Office

Application No:	GB1601225.4	**Examiner:**	Miss Lisa Robinson
Claims searched:	1-2	**Date of search:**	26 October 2016

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-2	KR 1020130020175 A (UNIV YONSEI IACF) See entire document, in particular paragraph [0006]
X	1-2	CN 204063671 U (FOSHAN SHUNDE GUANGTENG SOLAR ENERGY ELECTRICAL APPLIANCE CO LTD) See abstract and figures
X	1-2	CN 203615609 U (HENAN LANHAI ENERGY SAVING TECHNOLOGY SERVICE CO LTD) See abstract and figures
X	1	US 8091372 B1 (EKERN MARK) See entire document
X	1	US 8997509 B1 (WIGGS B RYLAND) See entire document
X	1	WO 2010/104757 A2 (HALLOWELL INTERNATIONAL LLC) See entire document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[X] :

Worldwide search of patent documents classified in the following areas of the IPC

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC

Intellectual Property Office

International Classification:

Subclass	Subgroup	Valid From
F25B	0030/00	01/01/2006
F28F	0017/00	01/01/2006