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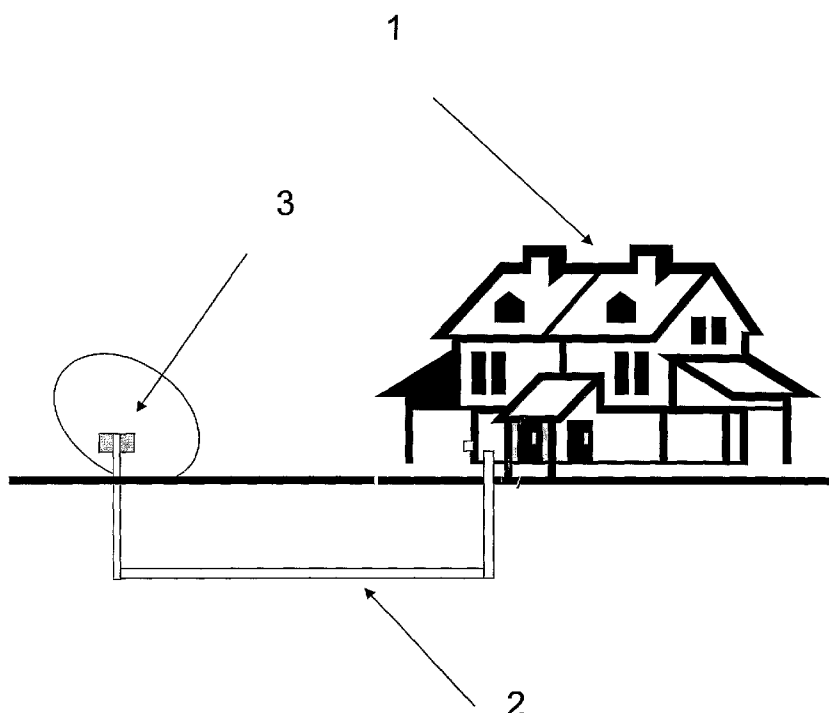
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*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: ENERGY PLANT



(57) Abstract: The present invention relates to a complete energy plant manufactured at a factory and at the customer's site the whole plant is lifted into its right place using a crane. If a crane lorry is used it can normally be placed on the street and the garden remains intact, Any fences and other obstacles for the truck do not need to be taken away and no wheel-tracks have destroyed the lawn and flower-beds.

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ENERGY PLANT

The present invention is based on a complete energy plant integrated into a building structure, the design of which fits into the surrounding environment and which has the strength/durability to withstand simple lifts and transport.

TECHNICAL BACKGROUND

The cost of energy for heating residential, industrial and other premises has increased drastically in recent years. Solutions with alternative energy sources complementing oil and electricity regularly appear on the market. The interest in biofuels has increased rapidly and pellet-fired heating plants are now an economic option.

Rebuilding when converting to new energy types is often costly and the expense is further increased by the plants being built individually at customers' premises.

The present invention solves these problems by the series manufacturing of entire plants placed in purpose-designed building structures and supplied completely assembled as "ready-to-connect" finished units. The energy plant is supplied complete from the factory with electrical, heating, water and sanitation installations that, at the customer's site, are connected to a prepared conduit and electricity supply.

To withstand lifting and transport, a building with an internal ready-installed plant weighing up to several tonnes must have a particularly stable design. Smaller buildings are often lifted using lift trucks and similar. It is not rare for outer panelling to be damaged during such lifts. The building in the present description is constructed to be lifted using lifting eyes. This eliminates damage to the shell caused by lifting with trucks.

BRIEF ACCOUNT OF THE INVENTION

The present application describes a complete energy plant that can be factory supplied ready-installed in a so-called "heating room". This is the size of a garden shed. Its roof is equipped with energy receivers (e.g. solar collectors or solar cells). The slope of the heating room's roof is optimised for energy reception and, on-site, the heating room can be placed optimally in relation to the sun.

Today, without major rebuilds, it is sometimes impossible to convert houses and other premises to new energy types, e.g. pellet burners. The heating room described here comes to the customer ready-assembled with the chosen energy plant.

Installation time is short and, consequently, costs are low. The entire plant is manufactured efficiently in series rather than individually at the customer's site. The total cost will thus be less than that of individually built plants.

As, just like a shed, it is intended that the plant should be placed in, for example, the garden of a house, the heating room may be said to have an attractive design. It should certainly not obtrude or protrude in its setting. For this reason and because the internal plant can weigh several tons, the heating room is constructed in a new way that uses a number of unique design solutions, which are included in this description and application.

The load-bearing parts (the frame structure) are made from plate metal and plate metal profiles. This gives the strength that permits the entire package to be lifted using a crane and the lifting eyes mounted to the load-bearing roof structure. The ability to lift the entire package using a large mobile crane also makes it possible to avoid touching garden surfaces. This means that deliveries can be received regardless of the ground's bearing capacity. At certain times, e.g. rainy periods, this capacity can limit accessibility.

The floor is plate metal and the walls are plaster. This is favourably fire-retardant.

SHORT DESCRIPTION OF THE FIGURES

The present invention is described in some detail with the assistance of 8 figures.

Figure 1 shows a house to which the energy plant is to be connected.

Figure 2 shows the energy plant with a schematic of a solution that uses pellets.

Figure 3 shows the energy plant connected to the conduit.

Figure 4 shows the lifting eyes and shackles.

Figure 5 shows certain floor-level details.

Figure 6 shows details of the solutions for connecting walls to the floor.

Figure 7 shows details of solutions at corner posts.

Figure 8 shows details of corner post/batten arrangements.

A FIRST CONSTRUCTION POSSIBILITY

Figure 1 shows a dwelling-house with a conduit (2) that contains the necessary connection pipes and which is finished with connection components (3) for connecting to the energy plant.

Clearly enough, new heat sources are needed not only by dwelling-houses but also by all types of heated industrial premises, garages, sports facilities, etc. To keep heat losses low, the design of the conduit (2) includes professionally executed insulation. To be perceived as attractive, if not beautiful, the building that houses the energy plant has an architectural appearance. This is to distinguish the present "machinery/plant" from today's predominantly container-like designs.

The plant should enhance the appearance of its settings. If the plant is carefully positioned in relation to shading objects and the sun's trajectory, the solar collector (7) on the roof can function optimally as a receiver.

Figure 2 shows a cutaway sketch of an installed pellet plant. The main components in such a plant are the pellet container (4), the burner feeder (5) and the electronics (6) that control the entire plant. The heating circuit fittings (7 and 8) handle the energy from the sun.

The energy plant is not restricted solely to pellet systems. It may also be based on other energy converting plants, e.g. oil, diesel, heat pumps (ground and lake), etc.

The eyes (10) used for lifting are located under a detachable plate and may themselves be removable.

Figure 3 shows how the conduit (2), which is buried in the ground, is connected to the energy plant.

5 Outline sketch 4 shows some of the essential elements involved when lifting the plant for transport to the customer. The lifting eyes (10) can be permanently fitted in a load-bearing beam or fitted when they are required. Said eyes are accessed by removing a plate metal element that forms the roof ridge.

10 The lower part of the roof frame has bolt holes for the fitting of shackles that are used to lash the plant for transport. This is a better solution than the usual strapping, which often results in damage (crushing, etc.) to the body of the building. Traffic authorities require loads to be secured.

Figure 5 contains a detail drawing showing a solution for fitting battens in a longitudinal bottom beam (12). The solution uses bolts (13) and weld nuts (14).

15 Figure 6 shows how wooden battens (18) are mated up to the floor plate (17), transverse load-bearing floor beams and longitudinal bottom beams (15). Figure 7 shows details of the fitting of wooden battens (19) to a corner post (20). Figure 8 shows how wooden battens (21) are screwed to a corner post (22) using hexagon head wood screws (22).

20 The solutions described here can, of course, be widely varied and the figures and text relate solely to one possible construction. The present invention is not limited solely to this one construction.

Alternative solutions are that the body of the building can be designed as modules so that the external dimensions can be varied in accordance with the storage
25 needs presented by different energy types or by different sizes of energy plants and output requirements.

The proposed floor construction (see figure 6) has a plate metal profile forming a sill around the room. In the event of leaks, said sill stops the leakage damaging
30 the walls.

PATENT CLAIMS

1. A free-standing energy plant for heating or cooling of media, e.g. water or air
5 or combinations thereof, and which is used in the supply of warm water
and/or in controlling the heating of properties, or similar, connected to said
energy plant, the whole being **characterised by:**
the parts of the energy plant being preferably installed in one building,
said building being designed to withstand the loads exerted by an installation
10 of considerable weight,
and said building being of a design that is suitable for loading to and from
vehicles for transport to customers.
2. Energy plant as claimed in claim 1,
15 **characterised by** the building's design being suitable for execution as
modules that allow external dimensions to be varied and changed by the
adding of new modules.
3. Energy plant as claimed in claims 1 – 2,
20 **characterised by** the building's design being such that loading and unloading
for transport is preferably done using lifting eyes, which can be integrated into
the framework or fitted at the time of lifting.
4. Energy plant as claimed in any of the preceding claims,
25 **characterised by** the plant's floor, wall and roof structures being of such a
stable construction that the building, with its complete internal installation, can
be lifted in its entirety using said eyes.
5. Energy plant as as claimed in any of the preceding claims,
30 **characterised by** the plant's floor being a plate metal profile design that
forms a sill around the room, said sill, in the event of fluid leaks, stopping the
leakage damaging the walls.

6. Energy plant as claimed in any of the preceding claims,
characterised by the energy plant being delivered complete from the factory
with energy generators and their operating components (preferably electricity,
heating, water and sanitation installations), the energy plant being ready for
connection to a chosen "energy transport unit".
7. Energy plant as claimed in any of the preceding claims,
characterised by said energy transport unit being a conduit.
8. Energy plant as claimed in any of the preceding claims,
characterised by it being advantageously possible to lift said building on-site
using a mobile crane, this sparing the surroundings (e.g. garden areas) from
the loads exerted by the wheels of the transport vehicle.
9. Energy plant as claimed in any of the preceding claims,
characterised by it being possible for the plant's outer surface (preferably a
roof section) to be equipped with energy receivers such as solar collectors.
10. Energy plant as as claimed in any of the preceding claims,
characterised by it being possible to select the roof slope for optimal
insolation and to place the plant in its surroundings so that optimum
advantage is taken of the sun's trajectory and exposure to thermal radiation.

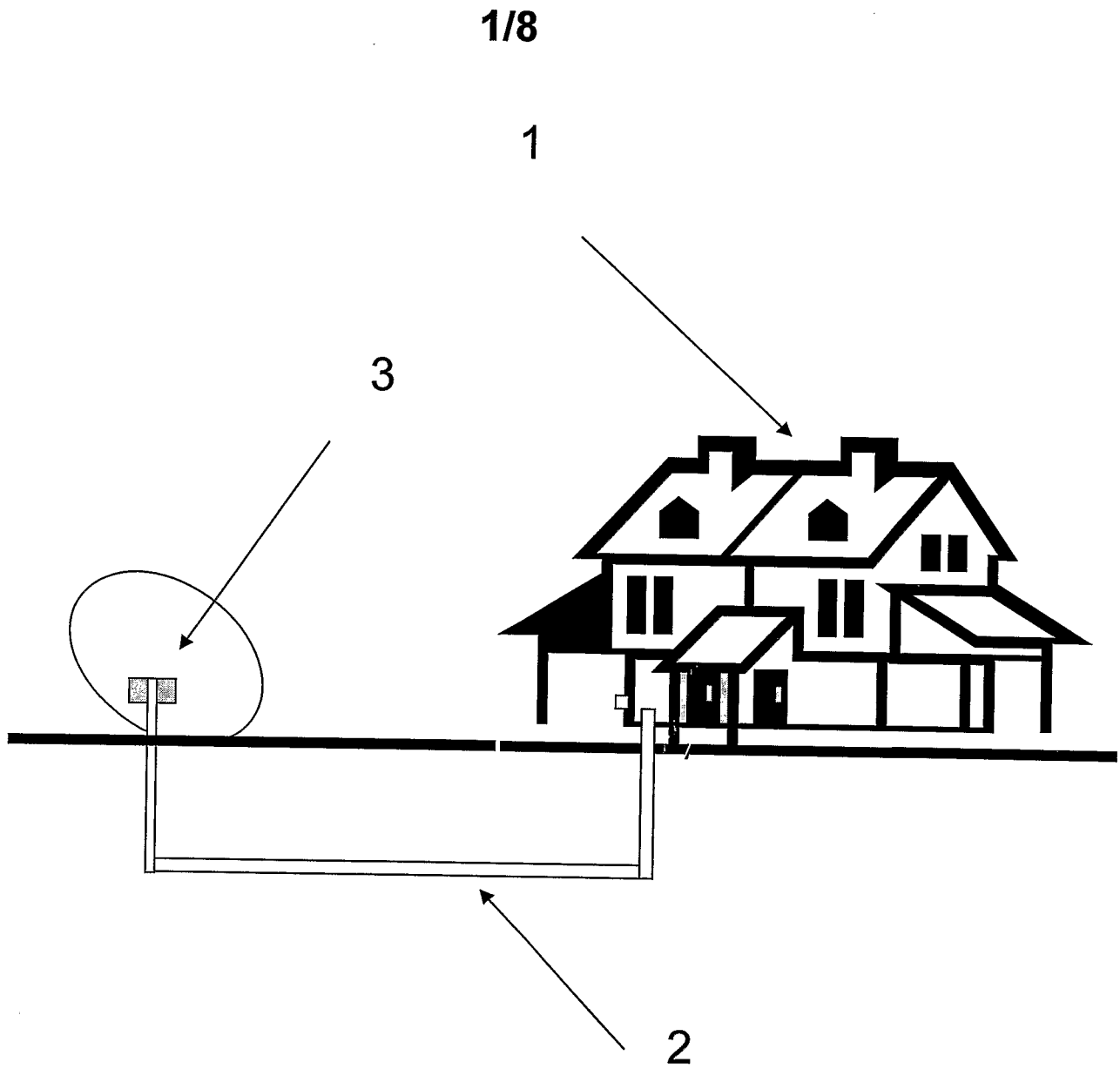
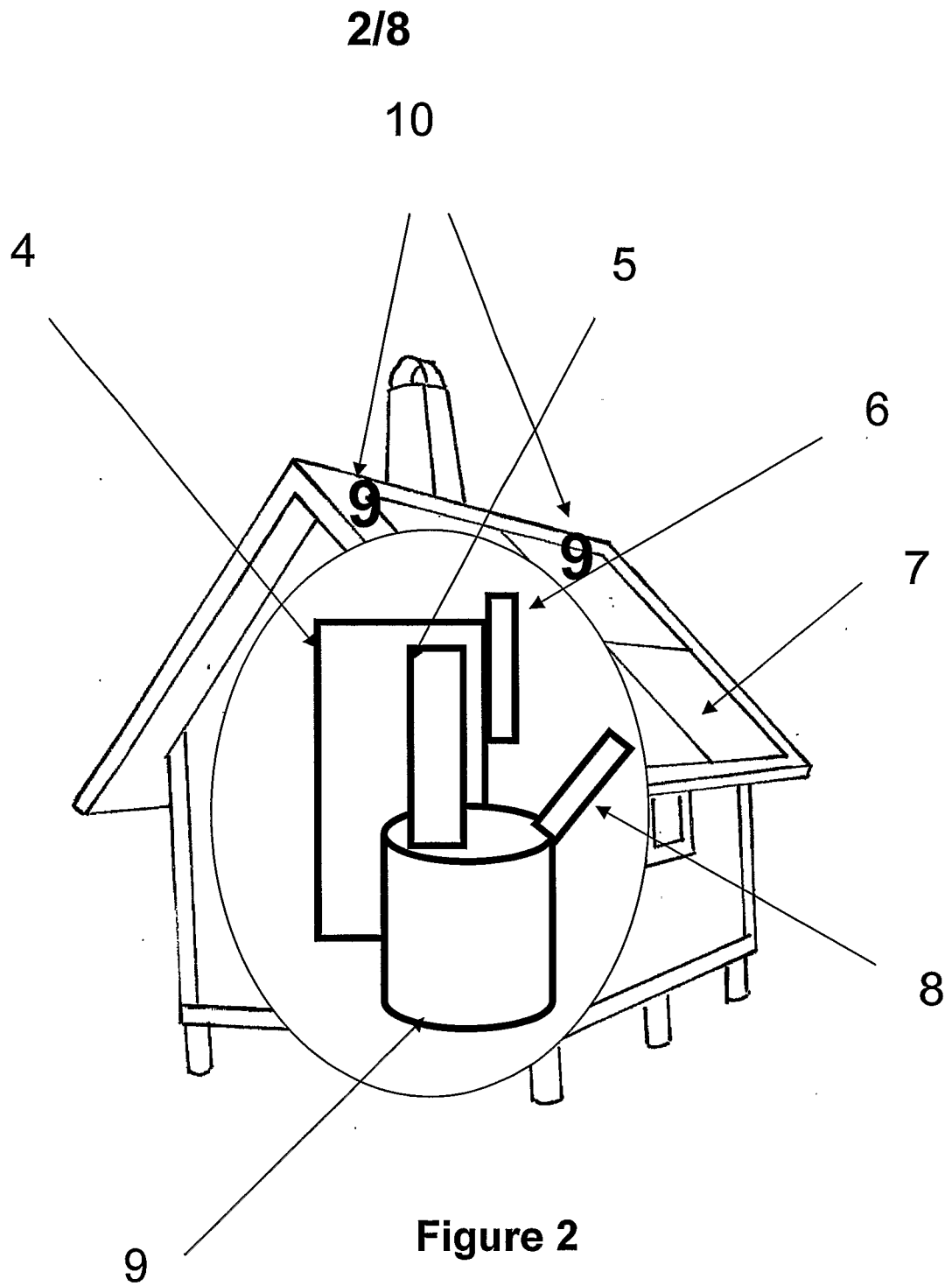
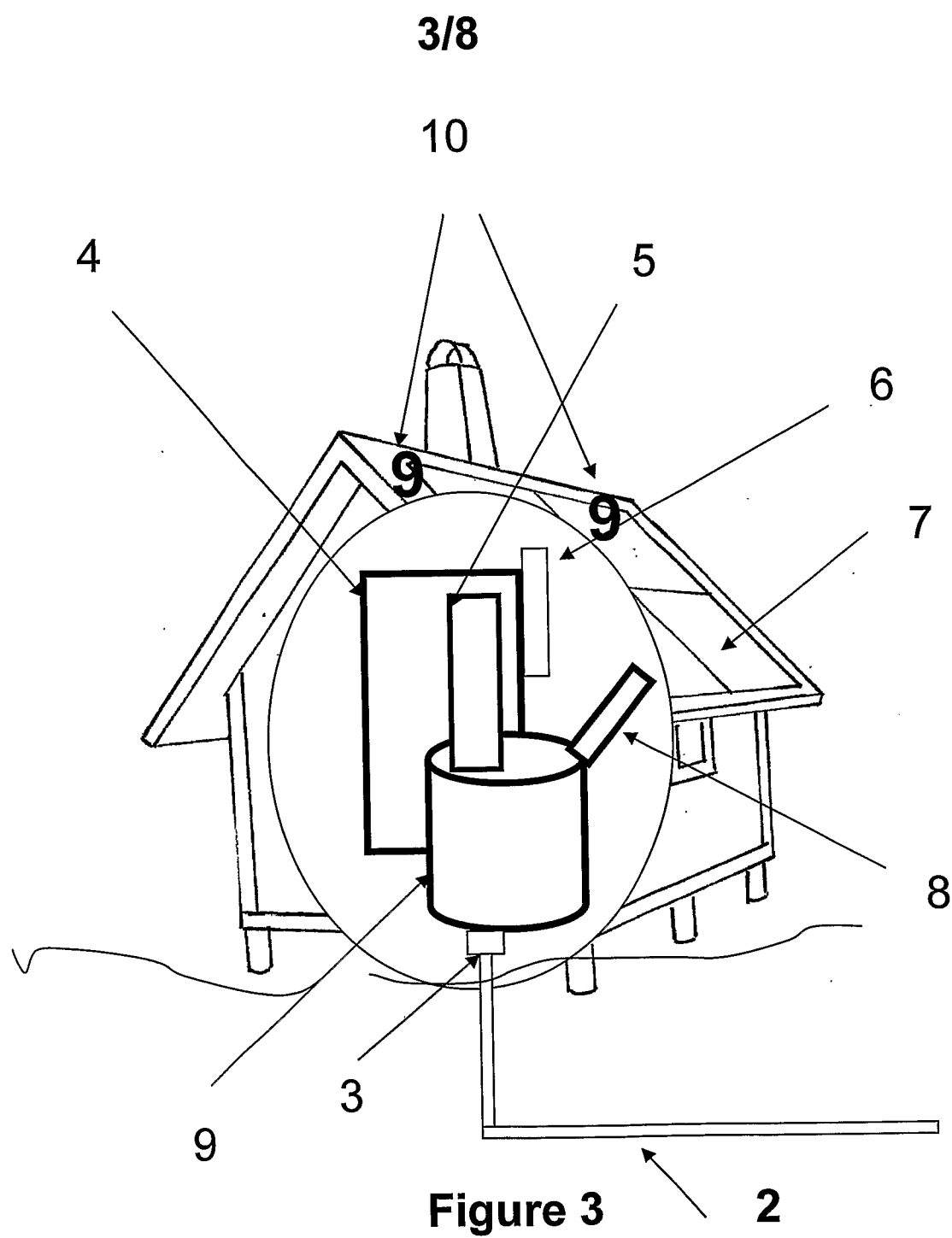


Figure 1





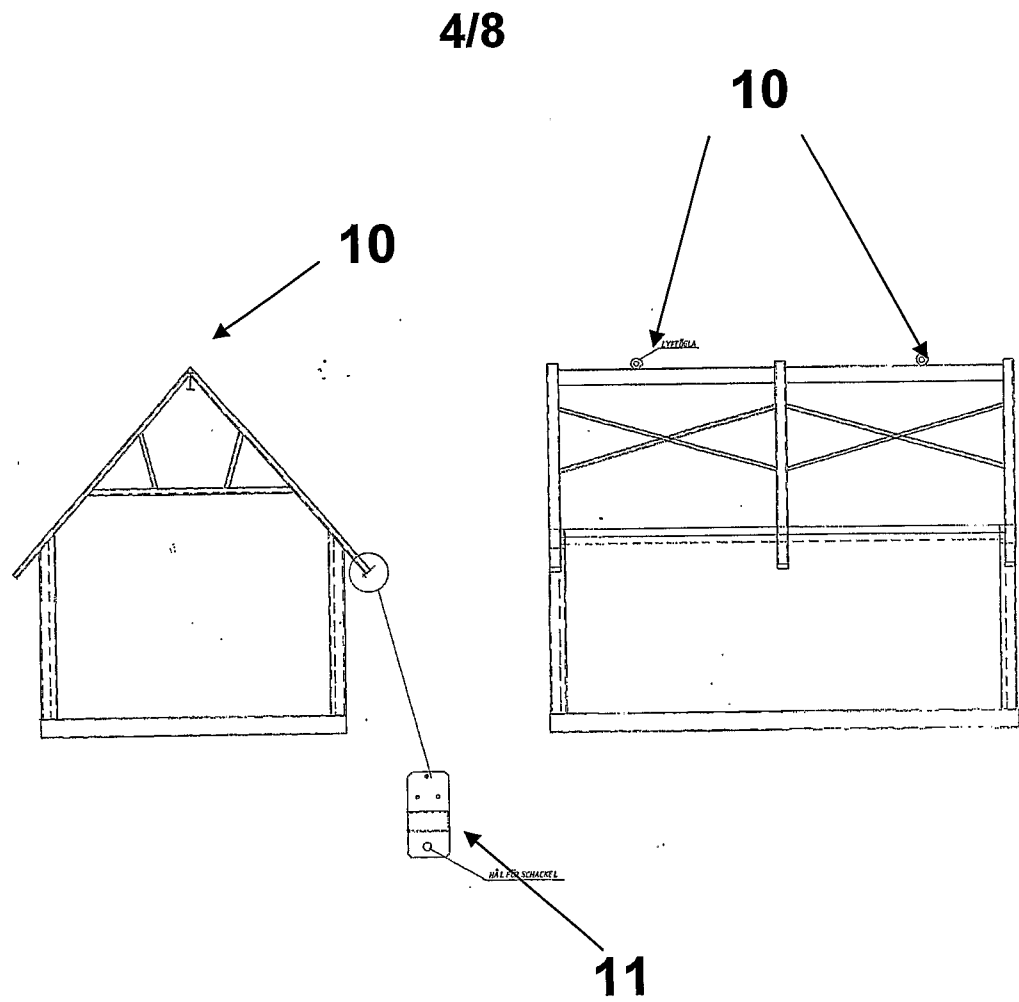


Figure 4

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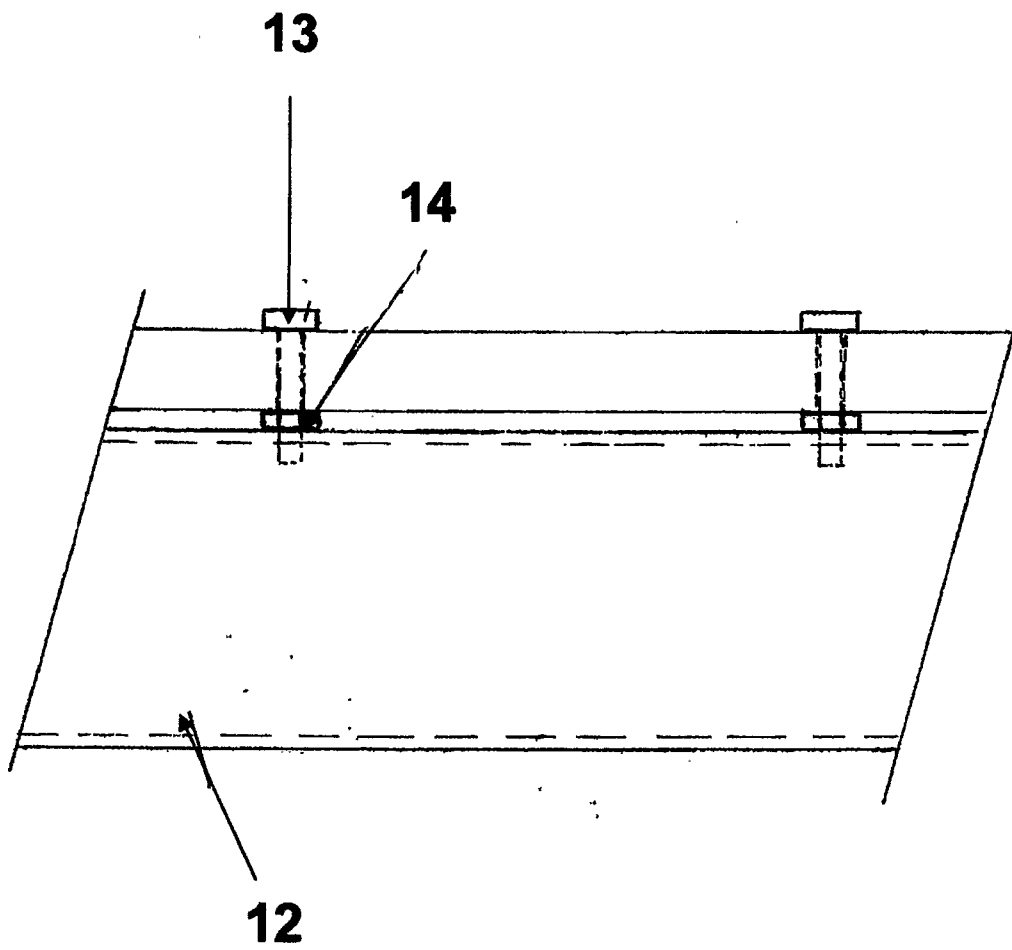


Figure 5

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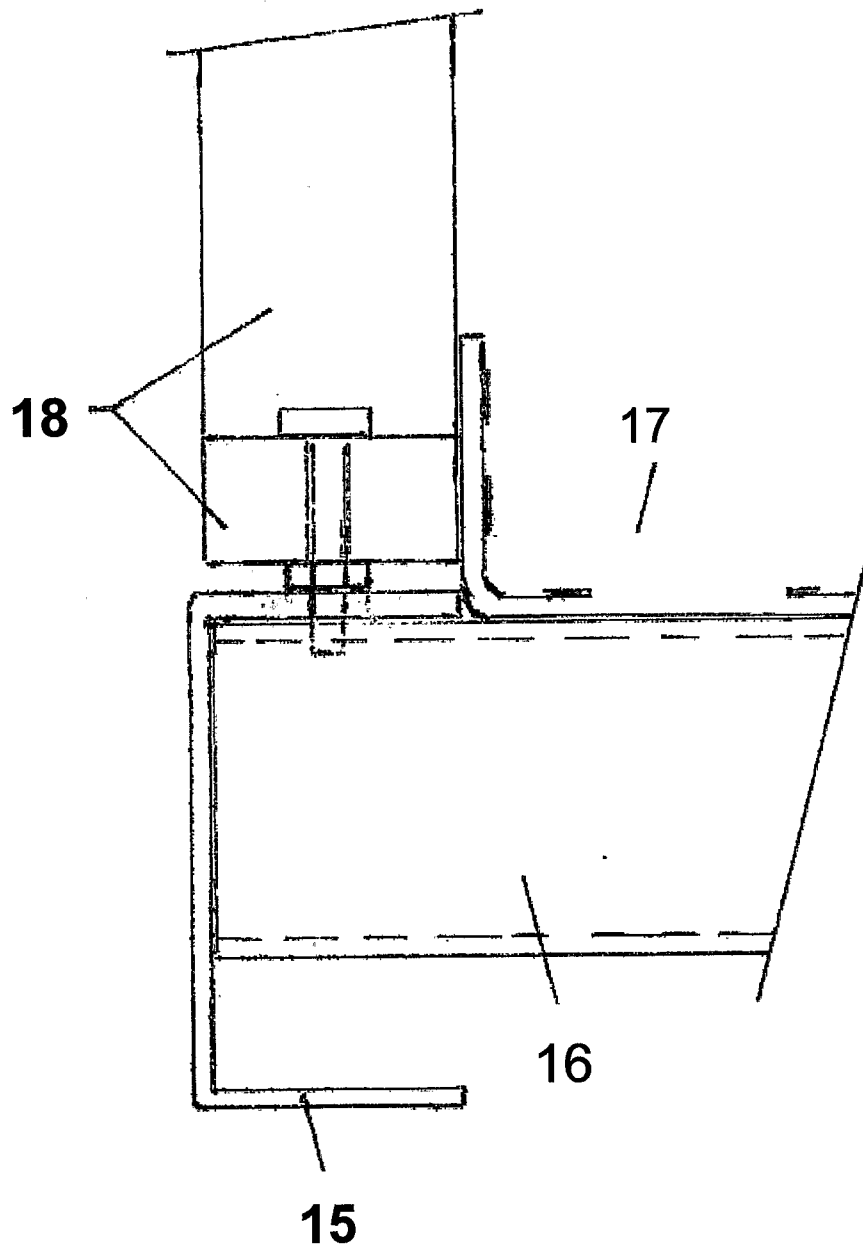


Figure 6

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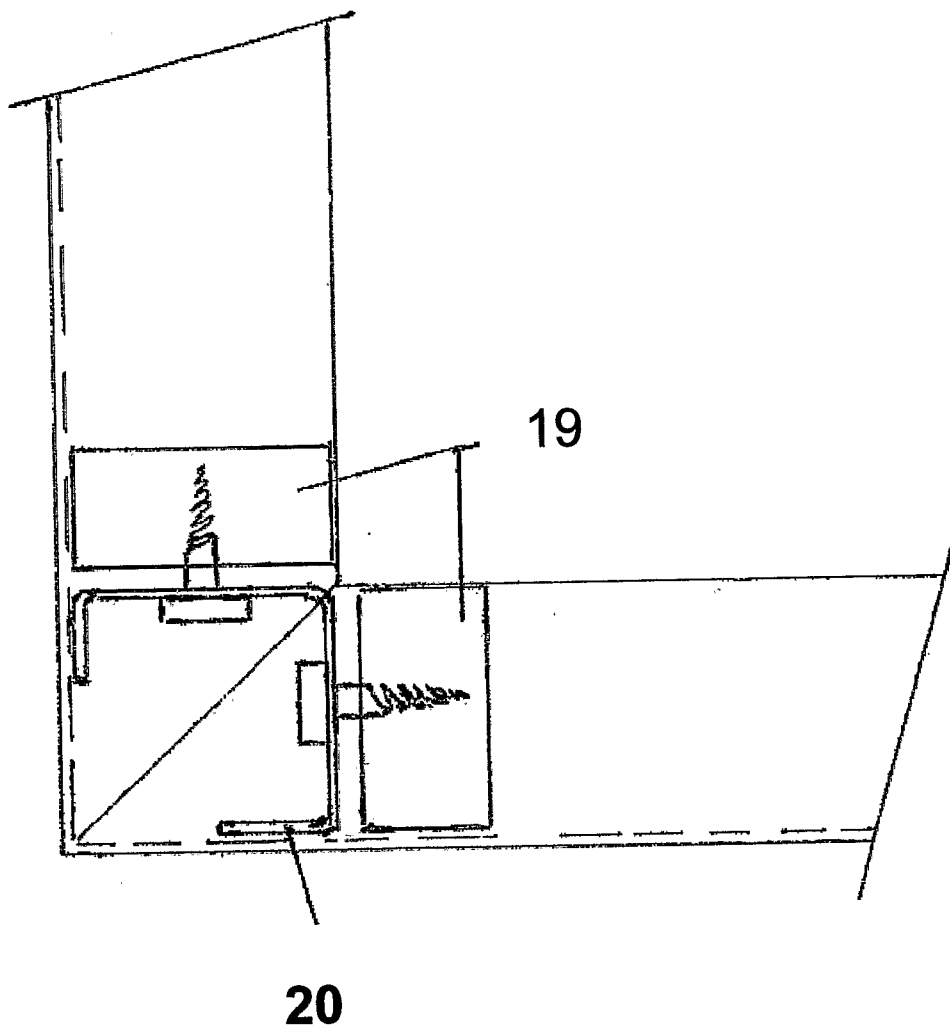


Figure 7

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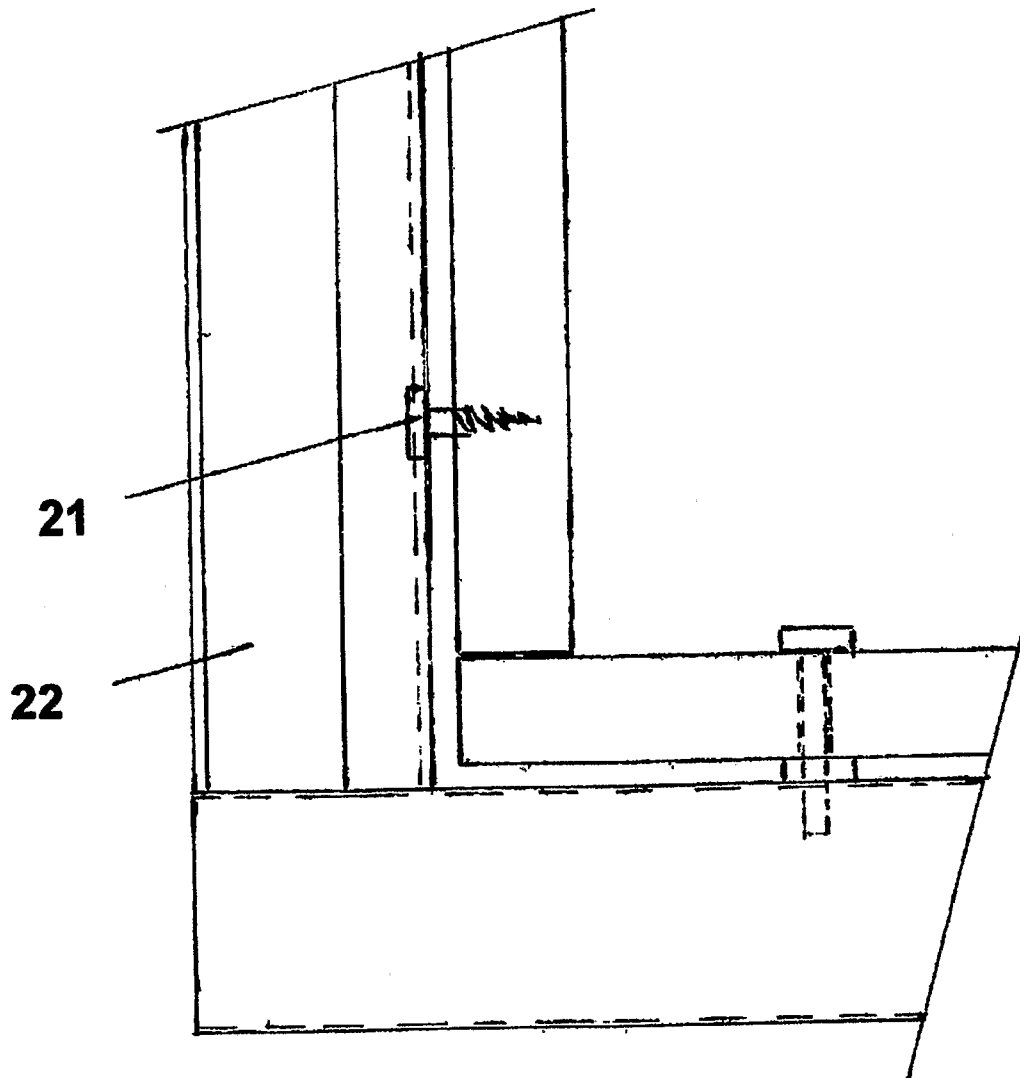


Figure 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2007/000568

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4077568 A (MAY), 7 March 1978 (07.03.1978)	1
Y	---	2-10
Y	SE 520925 C2 (BO-GUNNAR DAHL), 16 Sept 2003 (16.09.2003)	2-10

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

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