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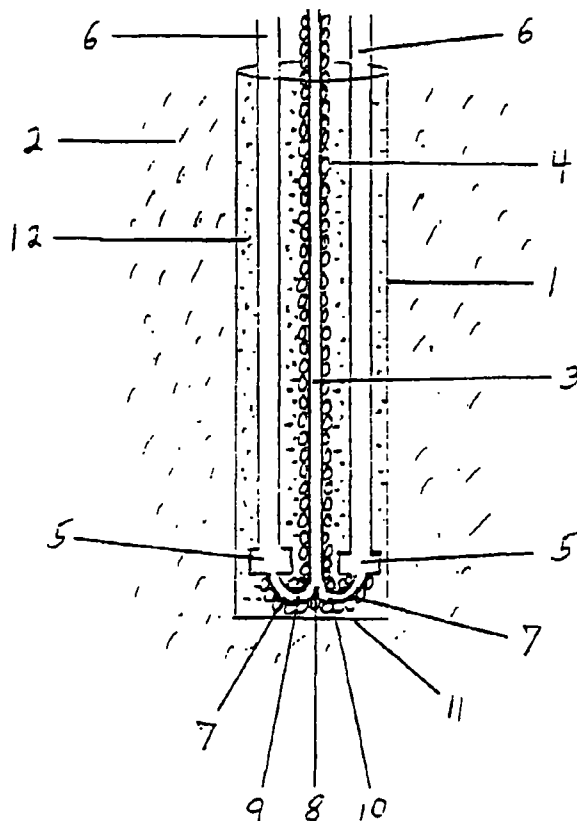
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(54) Title: INSULATED SUB-SURFACE LIQUID LINE DIRECT EXPANSION HEAT EXCHANGE UNIT WITH LIQUID TRAP



(57) Abstract: A direct expansion geothermal heat exchange unit, which can be placed in sub-surface ground and/or water, consisting of at least one insulated refrigerant liquid/fluid line (3), with a liquid trap (7) at the bottom of the liquid/fluid line, with at least one un-insulated refrigerant vapor/fluid line (6) operatively connected to the insulated liquid/fluid line (3) at a point above the liquid trap (7), where the un-insulated vapor/fluid line (6) is in thermal contact with its adjacent sub-surface surrounding elements by means of a heat conductive fill material (12) inserted as necessary to fill any void space, in any borehole or excavated area, between the vapor/fluid line and its respective adjacent sub-surface surroundings.



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