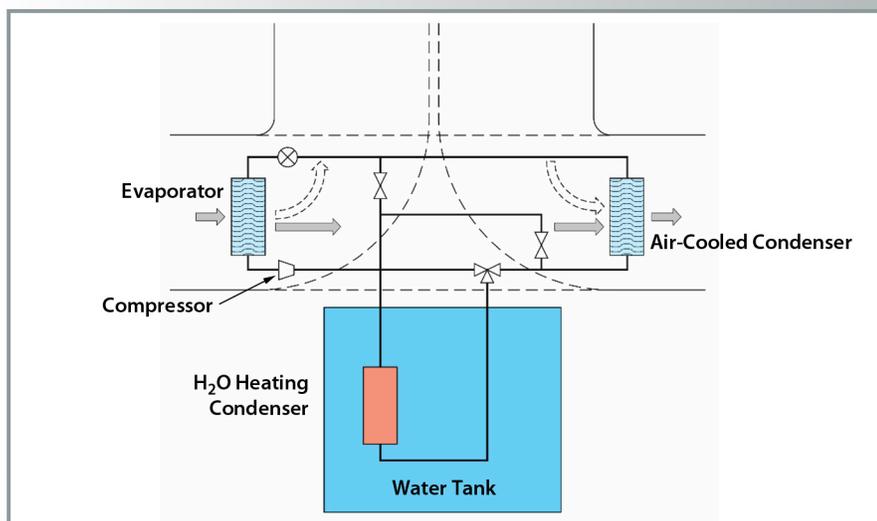


Water-Heating Dehumidifier

UT-B ID 200201096



Technology Summary

A small appliance developed at ORNL dehumidifies air and then recycles heat to warm water in a water heater. The device circulates cool, dry air in summer and warm air in winter. In addition, the invention can cut the energy required to run a conventional water heater by an estimated 50 per cent.

Conventional electric water heater designs have reached the limit of efficiency. The ORNL technology provides an innovative and highly cost efficient way to channel heat from warm, moist air to a hot water tank. The small appliance is ideal for the mobile homes market, where electric water tanks often stand against an outside wall. Additional ducting could allow a dehumidifier-water heater in one mode to circulate cool, dehumidified air in summer, while heating water in the tank. In winter, in a second mode, the system could bypass the water tank and circulate the warm, dehumidified air.

In this device, a fan draws air across an evaporator to produce cooled and dehumidified air. Heat taken from the air is absorbed by a refrigerant at the evaporator and then pumped to a condenser, where it is used to heat water. When the tank of the water heater is full of hot water, the device switches back to dehumidifier mode.

Advantages

- Qualifies for the EnergyStar rating as a dehumidifier
- Adding the invention to an electric water heater could cut the energy needed for heating water by an estimated 50%

Potential Applications

- Dehumidifier and electric water heater applications
- Mobile homes

Patent

John J. Tomlinson, *Water-Heating Dehumidifier*, U.S. Patent 7,028,490, issued April 18, 2006.

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