NASA TECH BRIEF

Marshall Space Flight Center

Solar -Energy Absorber: Active Infrared (IR) Trap Without Glass

The problem:

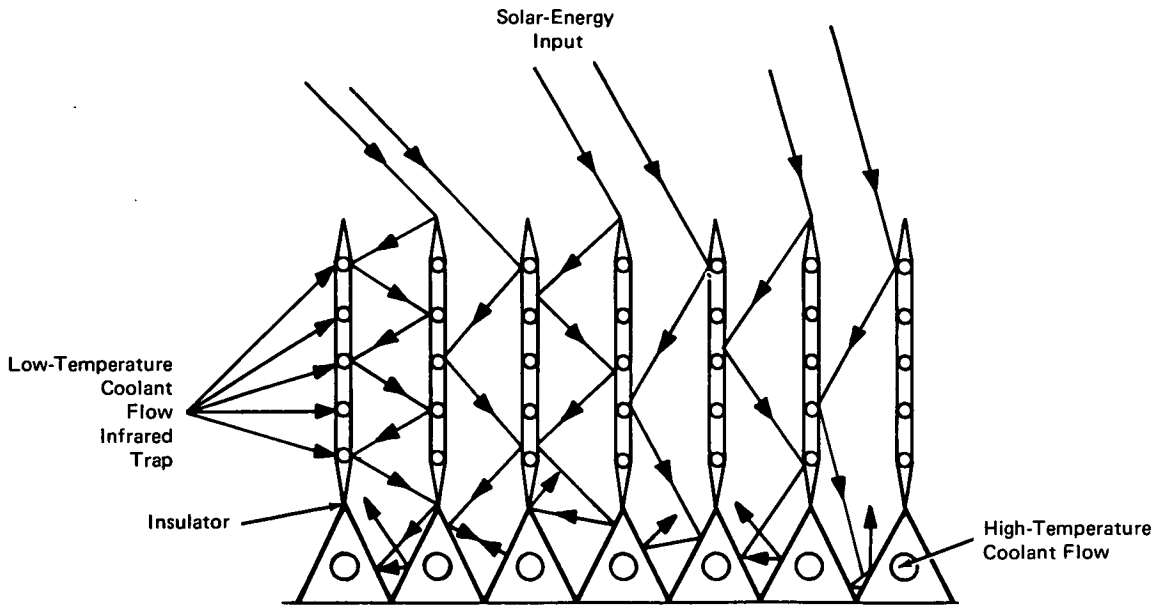
Present solar-energy absorbers, used in trapping solar radiation for thermal-to-electrical conversion systems, operate at efficiencies of up to 86 percent. The basic reason for the energy loss is the absorber configuration. A typical absorber collects solar heat through several glass plates located above the absorber surface. The effectiveness of heat transfer between the plates depends largely on their temperature difference: the larger this difference, the more effective the heat transfer. As solar energy penetrates the plates, a large part of it is trapped in the glass. As a result, the temperature difference between the plates is minimum, with a corresponding reduction in absorber efficiency.

The solution:

Absorber efficiency can be improved to 90 percent by removing the glass plates and using active infrared traps.

How it's done:

The new absorber configuration incroporates louvers which serve as infrared radiation traps (see figure). The traps have a coolant conveyed through ducts to trap any visible light incident on the absorber surface. The light is absorbed as infrared energy by the cooling medium, which collects the heat and carries it to where it is used.



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(continued overleaf)

Notes:

1. The new absorber configuration may be of interest to manufacturers of solar absorbers and to engineers and scientists developing new sources of energy.
2. Requests for further information may be directed to:
   Technology Utilization Officer
   Marshall Space Flight Center
   Code A&PS-TU
   Marshall Space Flight Center, Alabama 35812
   Reference: B73-10485

Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

Patent Counsel
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