

**Hybrid Heater – Cooler/Chiller Integrator with Thermal Transformer (HHCCI-TT) System  
for Efficient Heating, Cooling, Refrigeration, and Air Conditioning**

BY MILIVOJE M. KOSTIC, SYCAMORE, IL, ON JANUARY 25, 2010

**Abstract**

This is to disclose an invention of a *Hybrid Heater-Cooler/Chiller Integrator* (HHCCI) system as an innovative method and device for efficient heating, cooling, refrigeration and air conditioning. This technical innovation is achieved using so-called *Thermal Transformer* (TT) based on *Thermodynamic* principles and efficiency optimization with regard to the *First Law of Energy Conservation* and the *Second Law of Energy Degradation*. It may substantially increase integral efficiency of Heating, Cooling, Refrigeration, and Air Conditioning, and set up a new paradigm in the industry. The method is suitable for scaling devices from mobile to residential to commercial applications. This invention has been inspired by Hybrid Water Heaters and Hybrid Prius car where existing power and storage technologies are integrated and optimized to substantially increase the over-all efficiency.

**If interested in utilization and commercialization of the HHCCI-TT Invention,  
please email Inventor at [MK@MKostic.com](mailto:MK@MKostic.com). More contact information at [www.MKostic.com](http://www.MKostic.com)**

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**Background:**

The HHCCI-TT system employs innovative design and innovative application methods of efficient operation to provide simultaneously heating and cooling by integrating heat-pump and refrigeration cyclic machines, called here Thermal Transformer (TT) with Thermal Medium (TM, like water) storage systems and optimized Control System (CS) for improved energy efficiency and performance. Simultaneous heating and cooling are often required in buildings, industry and elsewhere; for example, to provide for space and water heating, refrigeration, air-conditioning, and heating and cooling for different other purposes in commerce, transportation and industry. The existing art is lacking in complete integration of heating and cooling as well as in achieving optimum thermodynamic efficiency and performance. The existing art of separate heating and cooling devices is also more expensive to fabricate and use than integrated system advised in this innovation. It is required in buildings, industry and elsewhere to provide energy for heating and cooling for different purposes, and different equipment is used, usually separate for heating and separate for cooling. If low-temperature heating is required, as is often the case for space heating and sanitary water for example and other process requirements, it is thermodynamically advantageous to use heat-pump cyclic devices (COP about 300%) but equipment being more expensive than classical simple heating equipment (COP efficiency below 100%). For cooling purposes, like in refrigeration and air conditioning and other process cooling requirements the use of refrigeration cyclic devices is necessary, and the latter could be used simultaneously for heating, thus working as heat pump and refrigeration machine simultaneously (called TT equipment here), thus eliminating cost for separate heating equipment while substantially increasing over-all energy efficiency and reducing use of energy resources and their environmental impact. With appropriate TM storage devices and optimized computerized process control to minimize working temperature-differences and other Thermodynamic irreversibilities, it is possible to eliminate prior art deficiencies and provide additional benefits



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Table with 6 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY.DOCKET.NO, TOT CLAIMS, IND CLAIMS. Values: 61/297,958, 01/25/2010, 110, empty, empty, empty.

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CONFIRMATION NO. 3049
FILING RECEIPT



Date Mailed: 02/12/2010

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections

Applicant(s)

Milivoje Kostic, Sycamore, IL;

Power of Attorney: None

If Required, Foreign Filing License Granted: 02/04/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US 61/297,958

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

\*\* SMALL ENTITY \*\*

Title

Hybrid Heater - Cooler Chiller Integrator with Thermal Transformer (HHCCI-TT) System for Efficient Heating, Cooling, Refrigeration, and Air Conditioning

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