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Krauthem et al.

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(54) **GAS TURBINE ENGINE HEAT EXCHANGER**

USPC 60/782, 785, 728, 39.02; 55/306
See application file for complete search history.

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
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F02K 3/06 (2006.01)
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(57) **ABSTRACT**

A gas turbine engine having a heat exchanger is disclosed. In one form the gas turbine engine includes a particle separator that can be used to separate particles or foreign objects and create a dirty flow and a clean flow. A blower can be used to discharge the particles or foreign objects from the separator. The heat exchanger includes a relatively warm flow path from a downstream region of a compressor and a relatively cool flow path from an upstream region of the compressor. The relatively cool flow path is merged with the dirty flow. In another embodiment, the gas turbine engine is a turbofan and the relatively cool flow path is merged with a bypass flow. In one embodiment of the engine the relatively warm flow path, after having exchanged heat with the relatively cool flow path is delivered to a working component without passing through a turbomachinery component.

(52) **U.S. Cl.**

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10 Claims, 1 Drawing Sheet

