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S. HOFFMAN
ENERGY TRANSFER DEVICE
Filed Sept. 1, 1964

3,280,907

FIG. 1.

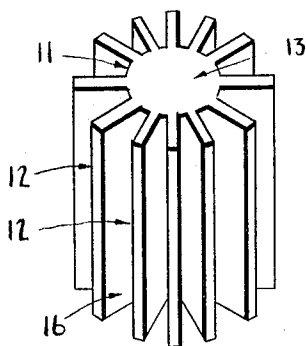


FIG. 2.

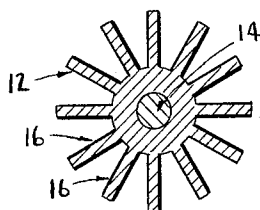


FIG. 4.

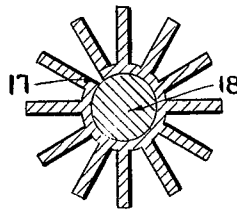


FIG. 3.

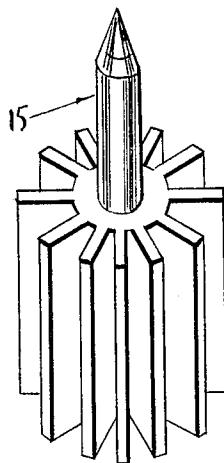


FIG. 5.

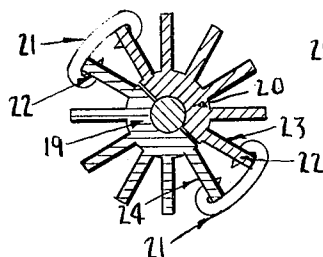


FIG. 6.

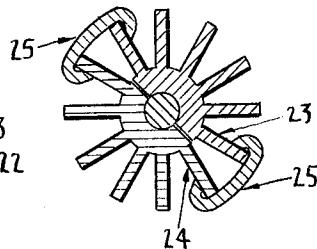


FIG. 7.

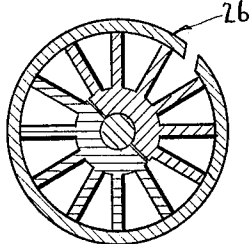


FIG. 8.

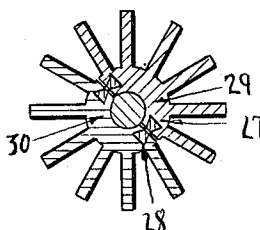
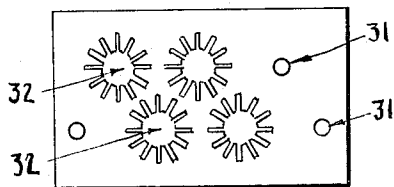


FIG. 9.



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ENERGY TRANSFER DEVICE

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1 Claim. (Cl. 165—185)

This invention relates to energy transfer devices and more particularly and specifically to energy transfer through a conductive material coated with a select film.

It is the object of this invention to provide novel energy transfer devices to accumulate energy for energy transfer from an energy body, a source or a sink, by conduction, radiation, and convection.

It is another object of this invention to form the external surfaces from a conductive material coated with a select film to be inert to fluids, gases, and acids of the energy environment.

It is another object of this invention to provide for energy transfer from a more remote energy body with an energy transfer device with a transport extension.

It is another object of this invention to furnish this energy transfer device with some human safety protection, to permit easy handling and to prevent injury from contact.

Other objects and features of my invention will become apparent from the following detailed description of certain embodiments when considered with the accompanying drawing.

FIG. 1 is a perspective view of the energy transfer device showing the basic embodiment of my invention.

FIG. 2 is an end view section of the device.

FIG. 3 is another perspective view with an extension attachment in position.

FIG. 4 is a section view of a split ring shank configuration.

FIG. 5, FIG. 6, FIG. 7, and FIG. 8 show how mating sections are secured together.

FIG. 9 is a symbolic illustration of mass energy transfer from a mass energy body utilizing a multiplicity of energy transfer elements.

In FIG. 1, my energy transfer device is illustrated as an elongated mass 11 having energy transfer surfaces 12 peripherally disposed. The center mass 13 forms the transport for the energy dissipated through the peripheral surfaces 12.

The energy source or the energy sink, hereafter referred to as the energy body, provides the energy supply for transport. The energy body 14 may be contained integral within the energy transfer device as shown in FIG. 2 or may be attached to the energy transfer device through a transport extension 15 as shown in FIG. 3.

Energy potential differences produce the flow phenomenon between the energy body and the external environment of the energy transfer device. The energy will flow from high potential to low potential. Therefore, principally, the rate of action of energy transfer is dependent on the environment, the surface area configuration, and the conductivity of the material of composition. Hence, the energy transfer device is formed from material having high energy conductivity preferably aluminum, although other suitable metals, alloys, etc. may be employed.

Furthermore, an additional coating 16 on the exterior surface provides for the energy transfer device protection from as well as contamination to the environment. A suitable protective film material is Teflon. Other satisfactory films may be other plastics, paints, metals, etc.

Referring again to FIG. 2 and FIG. 3, the energy transfer device is fabricated to provide suitable provision to accommodate the energy body 14 or the transport extension 15, respectively, by a variety of fastening techniques including press fit, soldering, bolting, etc. Some

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typical energy bodies are transport rods, tube walls, energy conversion devices, electrical elements, thermal elements, chemical reactions, nuclear instrumentalities, etc.

A shank with a split ring configuration 17 is the feature of the energy transfer device variation in FIG. 4.

The shank is sprung open to accept the compatible energy body 18 to be fitted within. Spring pressure action insures a snug fit requiring no additional fastening element and provides low contact coefficient loss between the materials.

FIG. 5 shows how mating sections 19 and 20 are joined together with suitable fastening elements. Spring clips 21 are passed into slots 22 provided on adjacent surfaces 23 and 24. In this way, the energy transfer device with a compatible opening may be easily sandwiched about a fixed energy body. Bolts, rivets, springs, etc. are other securing elements.

Slide U-shaped clips 25 hold adjacent surfaces 23 and 24 together in FIG. 6. In FIG. 7, an adjustable compression ring 26 peripherally mounted at intervals along the surface provides still another fastening procedure. Locking dovetail keys 27 may be driven into the dovetail keyways 28 to draw and to hold the mating sections 29 and 30 together, in FIG. 8.

FIG. 9 presents a symbolic representation of an energy dissipation system utilizing these elements. The mass material energy body has a multiplicity of insertion openings 31 to accept energy transport extension and energy transfer devices 32 in a flexible and variable pattern for a variety of energy transfer configurations.

While the specific embodiment of my invention has been shown and described in detail to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

I claim:

A heat transfer device for implementing the interchange of heat between an environment and a body to be heated comprising a slender rod of aluminum having a handle portion and a piercing portion, a plurality of peripherally disposed fins forming part of a heat transfer mass that is removably secured about said handle portion, said fins being longitudinally disposed with respect to the axis of the rod, the piercing portion of said rod being tapered at the end furthest removed from the handle portion for insertion into a body, said rod and said heat transfer mass being coated with Teflon whereby said device will be protected from environmental contamination.

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