

F28 HEAT EXCHANGE IN GENERAL (heat-transfer, heat-exchange or heat-storage materials C09K 5/00; arrangement or mounting of heat-exchangers in air-conditioning, air-humidification or ventilation F24F 13/30)

F28D HEAT-EXCHANGE APPARATUS, NOT PROVIDED FOR IN ANOTHER SUBCLASS, IN WHICH THE HEAT-EXCHANGE MEDIA DO NOT COME INTO DIRECT CONTACT (fluid heaters having heat generating means and heat transferring means F24H; furnaces F27; details of heat-exchange apparatus of general application F28F); **HEAT STORAGE PLANTS OR APPARATUS IN GENERAL [4]**

HEAT-EXCHANGE APPARATUS WITHOUT
INTERMEDIATE HEAT-TRANSFER MEDIA
OR BODIES

With stationary conduit assemblies
for only one medium using:
mass of fluid; trickle or film;
the cooling effect of
evaporation..... 1/00; 3/00;
5/00
for both media: by tubular
conduits; by plate-like conduits..... 7/00; 9/00
With moving conduit assemblies..... 11/00

With fluidised bed 13/00
HEAT-EXCHANGE APPARATUS WITH
INTERMEDIATE HEAT-TRANSFER MEDIA
OR BODIES
With the intermediate medium in
closed tubes passing into or through
the conduit walls 15/00
In which the intermediate medium
or body is contacted successively
by the other media 17/00, 19/00
HEAT STORAGE PLANTS OR APPARATUS 20/00
OTHER HEAT-EXCHANGE APPARATUS 21/00

1/00 Heat-exchange apparatus having stationary conduit assemblies for one heat-exchange medium only, the media being in contact with different sides of the conduit wall, in which the other heat-exchange medium is a large body of fluid, e.g. domestic or motor car radiators (F28D 5/00 takes precedence)
1/02 . with the heat-exchange conduits immersed in the body of fluid
1/03 . . with plate-like or laminated conduits [4]
1/04 . . with tubular conduits
1/047 . . . the conduits being bent, e.g. in a serpentine or zig-zag [4]
1/053 . . . the conduits being straight [4]
1/06 . with the heat-exchange conduits forming part of, or being attached to, the tank containing the body of fluid
3/00 Heat-exchange apparatus having stationary conduit assemblies for one heat-exchange medium only, the media being in contact with different sides of the conduit wall, in which the other heat-exchange medium flows in a continuous film, or trickles freely, over the conduits (F28D 5/00 takes precedence)
3/02 . with tubular conduits
3/04 . Distributing arrangements
5/00 Heat-exchange apparatus having stationary conduit assemblies for one heat-exchange medium only, the media being in contact with different sides of the conduit wall, using the cooling effect of natural or forced evaporation
5/02 . in which the evaporating medium flows in a continuous film or trickles freely over the conduits
7/00 Heat-exchange apparatus having stationary tubular conduit assemblies for both heat-exchange media, the media being in contact with different sides of a conduit wall
7/02 . the conduits being helically coiled (F28D 7/10 takes precedence)
7/04 . the conduits being spirally coiled (F28D 7/10 takes precedence)

7/06 . the conduits having a single U-bend (F28D 7/10 takes precedence)
7/08 . the conduits being otherwise bent, e.g. in a serpentine or zig-zag (F28D 7/10 takes precedence)
7/10 . the conduits being arranged one within the other, e.g. concentrically
7/12 . . the surrounding tube being closed at one end, i.e. return type (F28D 7/14 takes precedence)
7/14 . . both tubes being bent
7/16 . the conduits being arranged in parallel spaced relation (F28D 7/02 F28D 7/10 take precedence) [4]
9/00 Heat-exchange apparatus having stationary plate-like or laminated conduit assemblies for both heat-exchange media, the media being in contact with different sides of a conduit wall
9/02 . the heat-exchange media travelling at an angle to one another (F28D 9/04 takes precedence)
9/04 . the conduits being formed by spirally-wound plates or laminae
11/00 Heat-exchange apparatus employing moving conduits
11/02 . the movement being rotary, e.g. performed by a drum or roller (F28D 11/08 takes precedence)
11/04 . . performed by a tube or a bundle of tubes
11/06 . the movement being reciprocating or oscillating (F28D 11/08 takes precedence)
11/08 . more than one conduit assembly performing independent movements, e.g. rotary bundle of tubes in a rotary drum
13/00 Heat-exchange apparatus using a fluidised bed

Heat-exchange apparatus employing intermediate heat-transfer media or bodies [3]

- 15/00 Heat-exchange apparatus with the intermediate heat-transfer medium in closed tubes passing into or through the conduit walls**
- 15/02 . in which the medium condenses and evaporates, e.g. heat-pipes [4]
- 15/04 . . with tubes having a capillary structure [6]
- 15/06 . . Control arrangements therefor [6]
- 17/00 Regenerative heat-exchange apparatus in which a stationary intermediate heat-transfer medium or body is contacted successively by each heat-exchange medium, e.g. using granular particles**
- 17/02 . using rigid bodies, e.g. of porous material
- 17/04 . Distributing arrangements for the heat-exchange media

- 19/00 Regenerative heat-exchange apparatus in which the intermediate heat-transfer medium or body is moved successively into contact with each heat-exchange medium**
 - 19/02 . using granular particles
 - 19/04 . using rigid bodies, e.g. mounted on a movable carrier
 - 20/00 Heat storage plants or apparatus in general** (specially adapted for particular applications, see the relevant places, e.g. F24D 15/02); **Regenerative heat-exchange apparatus not covered by groups F28D 17/00 or F28D 19/00 [4]**
 - 20/02 . using latent heat [6]
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- 21/00 Heat-exchange apparatus not covered by any of the groups F28D 1/00 F28D 20/00 [4]**