

COLD AIR REFRIGERATING SYSTEM AND TURBORXPANDER TURBINE FOR THIS SYSTEM

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Abstract

An air-cooling device comprises compressor (1). Double cavity heat exchanger (2), turbo expander (6) and the freezing chamber (3) containing fan (5) and air cooler (4). Fan (7) is mounted on the same shaft with the turbo expander (6). The first cavities of the heat exchangers (9 and 2), moist separator (8) and the second cavity of the heat exchanger (2) are connected with the compressor (1) input in sequence. In the other appearance the device comprises compressor (44) and turbo expander (49), double cavity heat exchanger (45), freezing chamber (46) containing fan (48) and air cooler (47), double cavity vaporization heat exchanger (51) and moist separator (50). The first cavities of the vaporization heat exchangers (51 and 45), moist separator (50, turbo expander (49), air cooler (47) and the second cavity of the heat exchanger (45) are in sequence connected with the compressor input (44). The bearing disk (67) of the turbine wheel (66) is constructed with inter blade canals (69) conjugates by means of the flutes (70) with the meridional disk surface (67). The canal surface (69) contain longitudinal micro canal (71). The radius of the micro canal (71) cross cut is 0.1 – 1.0 of the radius (R_f) of the flute (70), the pitch (t) between the micro canals (71) is not more than the double radius (R_k) and the height (h) of the micro canal (71) is about 0.2 – 1.0 of the radius (R_k).

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