

CLAIMS

1. Buffer storage arrangement filled with phase change material for storing heat energy, comprising a container (1) having open or sealed configuration, a heat exchanger unit (2) arranged in the container (1), and liquid-solid phase change material encompassing the heat exchanger unit (2) inside the container (1), wherein the heat exchanger unit (2) comprises pipe coils (21, 22) formed from bent pipes and heat exchanger fins (23) adapted for interconnecting the pipe coils (21, 22), wherein each pipe coil (21, 22) is situated along a respective imaginary plane, the imaginary planes being arranged parallel beside one another, and the heat exchanger fins (23) are arranged aligned with the direction of the cross-section of the pipes of the pipe coils (21, 22), substantially perpendicular to the imaginary planes of the pipe coils,

characterized in that the cross-sectional area of the container (1) is essentially filled by the heat exchanger fins (23) such that fluid communication between the walls (11, 12, 13, 14) of the container (1) and the heat exchanger unit (2) is provided in order to balance inhomogeneities between the spatial regions (15) separated by the heat exchanger fins (23).

2. The buffer storage arrangement according to Claim 1, characterized in that the walls (11, 12, 13, 14) of the container (1) and the heat exchanger fins (23) of the heat exchanger unit (2) are spaced apart with respect to each other.

3. The buffer storage arrangement according to Claim 1, characterized in that the heat exchanger fins (23) of the heat exchanger unit (2) comprise through holes or cutouts that are arranged along the walls (11, 12, 13, 14) of the container (1) and extend between the spatial regions (15) separated by the fins.

4. The buffer storage arrangement according to one of the preceding Claims, characterized in that the distance between adjacent pipes is identical in both substantially mutually perpendicular transverse directions.

5. The buffer storage arrangement according to one of the preceding Claims, characterized in that shoulders adapted for providing a uniform distance between the fins

(23) are disposed on the heat exchanger fins (23) around the pipes, the shoulders being formed of material originating from perforations made for the pipes passed therethrough.

6. The buffer storage arrangement according to one of the preceding Claims, characterized in that the uniform distance between the heat exchanger fins (23) is preferably between 2.1 and 6 mm.

7. The buffer storage arrangement according to one of the preceding Claims, characterized in that the heat exchanger fins (23) have an undulating surface configuration.

8. The buffer storage arrangement according to one of the preceding Claims, characterized in that every second pairs of mutually parallel arranged pipe coils (21) are interconnected to form a primary circuit (P), wherein the primary circuit (P) further comprises a primary distribution pipe (24) to which the inlets of the pipe coils (21) forming the primary circuit (P) are connected and a primary manifold (25), to which the outlets of the pipe coils (21) forming the primary circuit (P) are connected, and wherein the pipe coils (22) situated between the pipe coils (21) of the primary circuit (P) form a secondary circuit (S), the secondary circuit (S) further comprising a secondary distribution pipe (26) to which the inlets of the pipe coils (22) forming the secondary circuit (S) are connected and a secondary manifold (27) to which the outlets of the pipe coils (22) forming the secondary circuit (S) are connected, with a primary heat-transfer medium and a secondary heat-transfer medium, disposed in the primary circuit (P) and the secondary circuit (S), respectively, being circulated in a counter-flow fashion through the pipe coils (21, 22).

9. The buffer storage arrangement according to Claim 8, characterized in that the primary distribution pipe (24), the secondary distribution pipe (26), the primary manifold (25) and the secondary manifold (25) are configured such that there is an identical volumetric flow through all the parallel pipe coils (21, 22).

10. The buffer storage arrangement according to one of the preceding Claims, characterized in that the container (2) has a rectangular block shape.

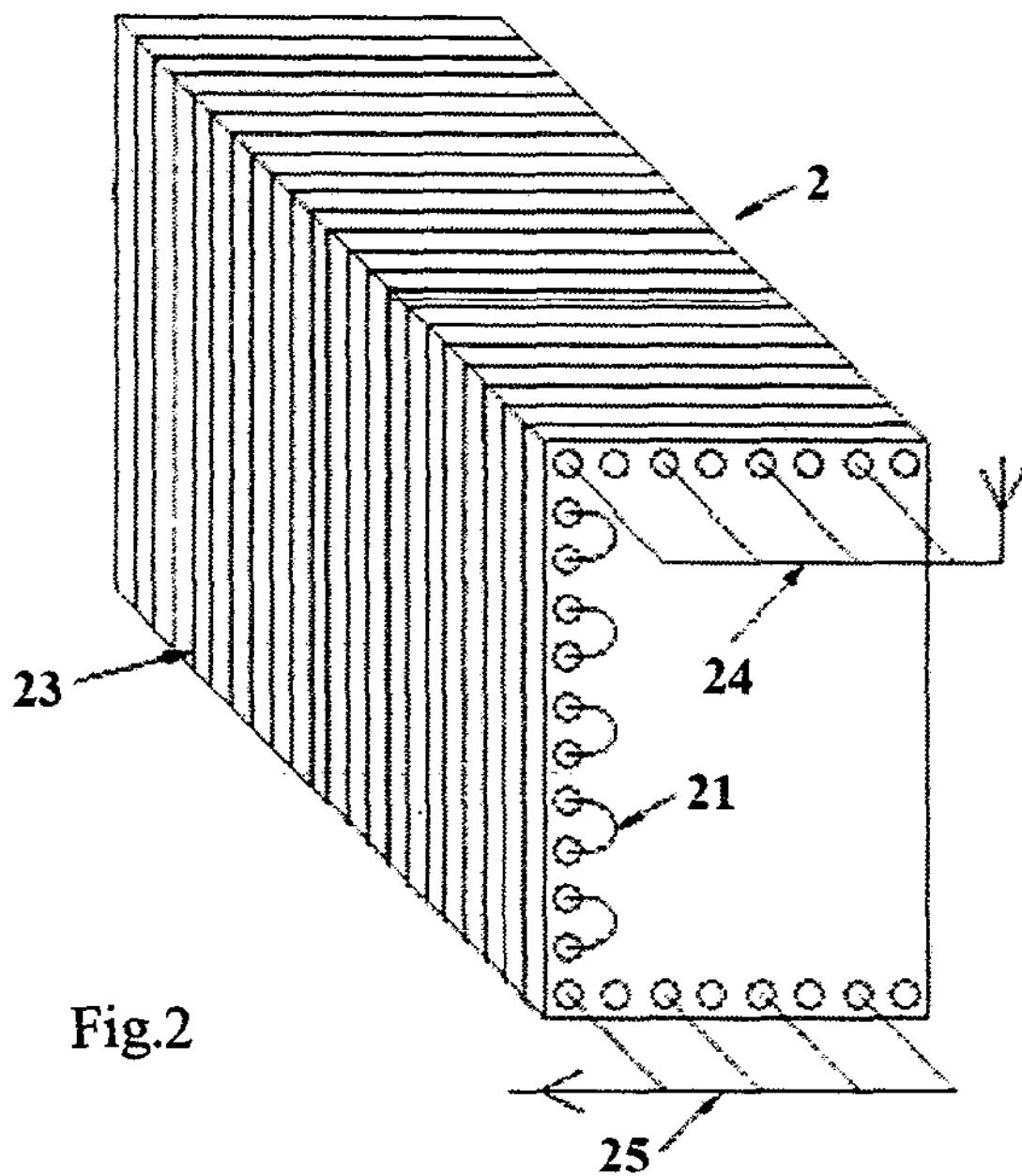


Fig.2