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ABSTRACT

Two passages adjacent to each other via walls are formed spirally, and heat is exchanged between fluids passing through the passages via the walls. Upper and lower end faces of the spiral passages are covered with end plates, and the spiral passages and the end plates are sealed air-tightly. The end plates have a first passage inlet opening only to the first passage, a first passage outlet opening only to the first passage, a second passage inlet opening only to the second passage and a second passage outlet opening only to the second passage. Each of the inlets and outlets is open to every turn of the spiral passage. A first fluid entering the passage from the first passage inlet passes through the first passage for less than one turn only and is discharged from the first passage outlet. A second fluid entering the passage through the second passage inlet passes through the second passage for less than one turn only and is discharged from the second passage outlet. Thus, since the fluids entering from the openings pass through the passages for less than one turn only, the pressure loss is small, throughput is high, and the power used for the processing can be reduced.