

Vacuum sorption device

The invention relates to a vacuum sorption device according to the preamble of Patent Claim 1.

A vacuum sorption device of the type mentioned at the beginning is known according to DE 10 2004 049 411 A1. It consists of a volume area, in which a sorbent (for example, zeolite), which periodically sorbs and desorbs a refrigerant (such as water) is situated and which is formed at least partially enclosed by a condenser, the condenser being bounded by an outer wall of the volume area and a further enclosure wall.

The mode of operation and all further components of this vacuum sorption device are described in detail in DE 10 2004 049 411 A1. Reference is made thereto in its entirety for the sake of simplicity.

In addition, for the sake of completeness, reference is also made to DE 36 25 247 A1, which discloses a similar embodiment with respect to the condenser.

The invention is based on the object of further improving a vacuum sorption device of the type mentioned at the beginning.

This object is achieved with a vacuum sorption device of the type mentioned at the beginning by the features listed in the characterizing part of Patent Claim 1.

It is thus provided according to the invention that alternately the outer wall and/or the enclosure wall is/are provided with embossments oriented toward the respective other wall to fix a flow gap width in the condenser.

In other words, it is provided according to the invention that the width of the flow gap between the outer wall and the enclosure wall is precisely defined with the aid of a

plurality of embossments. On the one hand, this ensures that the gap width has the desired dimension over the entire height of the condenser. On the other hand, through a corresponding flow influence of the fluid flowing through the condenser, it encourages the heat transfer between the volume area enclosing the sorbent and the condenser.

Other advantageous refinements of the vacuum sorption device according to the invention result from the dependent patent claims.

For the sake of completeness, reference is additionally also made to DE 589 823 A, from which a periodic absorption refrigerator is known. A so-called corrugated plate (reference sign 10) is known therefrom, but it is situated outside the condenser (reference sign 9).

The vacuum sorption device according to the invention, including the advantageous refinements thereof according to the dependent patent claims, will be explained in greater detail hereafter on the basis of the illustration in the drawing of a preferred exemplary embodiment.

In the figure:

Figure 1 shows the vacuum sorption device according to the invention in section (not to scale).

The vacuum sorption device shown in Figure 1 consists in a known way, *inter alia*, of a volume area 1, in which a sorbent 2 (zeolite here [not shown in greater detail]), which periodically sorbs or desorbs a refrigerant (water here), is situated and which is formed at least partially enclosed by a condenser 3, the condenser 3 being bounded by an outer wall 4 of the volume area 1 and a further enclosure wall 5.

It is essential for the illustrated vacuum sorption device according to the invention that the enclosure wall 5 is provided with embossments 6 oriented toward the outer wall 4

to fix a flow gap width in the condenser.

Alternatively (not shown), however, it can also be provided that the outer wall 4 is provided with embossments 6 oriented toward the enclosure wall 5 to fix a flow gap width in the condenser. In addition, it can finally be provided (also not shown), that the outer wall 4 and the enclosure wall 5 are each provided with embossments 6 oriented toward the respective other wall 4, 5 to fix a flow gap width.

These measures result in a condenser structure which is distinguished, on the one hand, by high (pressure) stability and, on the other hand, by good heat transfer, with simple production ability.

As shown in Figure 1, it is provided that the outer wall 4 of the volume area 1 and the enclosure wall 5 are formed as cylindrical, so that a cylindrical ring gap space results between the outer wall 4 and the enclosure wall 5. Furthermore, the cylindrical outer wall 4 is formed in the preferred embodiment as between 400 and 500 mm tall and between 250 and 350 mm in diameter.

Furthermore, it is particularly preferably provided that a gap, which is defined by the embossments 6, between the outer wall 4 and the enclosure wall 5 is formed as less than 2 mm wide, preferably less than 1 mm. Particularly good flow distribution inside the condenser can be achieved in that the embossments 6 are situated uniformly distributed on the enclosure wall 5 and between 10 and 40 mm, preferably 20 to 30 mm, away from one another. Furthermore, it is preferably provided that the embossments 6 are formed in the form of spherical caps and have a diameter of 1 to 2 mm.

Furthermore, as is obvious from Figure 1, a collector housing 7 is situated on both ends of the cylindrically formed enclosure wall 5. It is preferably formed integrally and in the form of a bead from material of the enclosure wall 5, furthermore, a connection 8 for alternately supplying or

removing a fluid being provided on each collector housing 7 and the connections 8 on the collector housings 7 being situated offset to one another with respect to the circumference.

With respect to simple manufacturing or assembly, it has proven to be advantageous if the enclosure wall 5 is formed as a prefinished part having the embossments 6 and preferably as fastenable by being pushed on to the outer wall 4, which is formed as free of embossments 6, and being fluid-tight thereon (in particular by welding on).

List of reference numerals

- 1 volume area
- 2 sorbent
- 3 condenser
- 4 outer wall
- 5 enclosure wall
- 6 embossment
- 7 collector housing
- 8 connection

Patent Claims

1. A vacuum sorption device, comprising a volume area (1), in which a sorbent (2) which periodically sorbs and desorbs a refrigerant is situated and which is formed at least partially enclosed by a condenser (3), the condenser (3) being bounded by an outer wall (4) of the volume area (1) and a further enclosure wall (5),
characterized in
that alternately the outer wall (4) and/or the enclosure wall (5) is/are provided with embossments (6) oriented toward the respective other wall (4, 5) to fix a flow gap width in the condenser.
2. The vacuum sorption device according to Claim 1,
characterized in
that a gap, which is defined by the embossments (6), between the outer wall (4) and the enclosure wall (5) is formed less than 2 mm wide.
3. The vacuum sorption device according to Claim 1,
characterized in
that the embossments (6) are situated uniformly distributed on the enclosure wall (5) and at a distance of between 10 to 40 mm, preferably 20 to 30 mm from one another.
4. The vacuum sorption device according to Claim 1,
characterized in
that the embossments (6) are formed in the shape of spherical caps and preferably have a diameter of 1 to 2 mm.
5. The vacuum sorption device according to Claim 1,
characterized in
that the outer wall (4) of the volume area (1) and the enclosure wall (5) are formed as cylindrical.

6. The vacuum sorption device according to Claim 5,
characterized in
that a collector housing (7) is situated on at
least one end of the cylindrically formed enclosure
wall (5).
7. The vacuum sorption device according to Claim 6,
characterized in
that the collector housing (7) is integrally formed
from material of the enclosure wall (5) and is
preferably in the form of a bead.
8. The vacuum sorption device according to Claim 6,
characterized in
that a connection (8) for alternately supplying or
removing a fluid is provided on the collector housing
(7).
9. The vacuum sorption device according to Claim 8,
characterized in
that connections (8) on the collector housings (7)
are situated offset to one another with respect to the
circumference.
10. The vacuum sorption device according to Claim 1,
characterized in
that the enclosure wall (5) is formed as a
prefinished part having the embossments (6) and
preferably so it can be pushed onto the at least one
collector housing (7) on the outer wall (4), which is
formed free of embossments (6).