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(54) VORTEX HEAT-GENERATOR

WIRBELWÄRMEERZEUGER

GÉNÉRATEUR DE CHALEUR TOURBILLONNAIRE

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Description

[0001] This invention belongs to heat-and-power engineering and, in particular, is intended for heating of various premises and hot water supply. This invention can be also applied in various industries, in particular for processing of liquid mediums, thus obtaining necessary physical and chemical technological properties.

[0002] A well-known mechanical heat-generator [1], works simultaneously as a water circulation balancer and a water generator and consists of discs, and the inlet branch pipe is equipped with an internal Archimedes's screw which allows avoiding application of the circulation pump. One of the disadvantages of this generator is rather complex construction of the hot water generator and the significant rotational frequency up to 1000 rpm.

[0003] Another known type of rotary pump heat-generator [2] is characterized by the following: rotation of the rotor shaft draws fluid into the axial chamber, where it passes on the vanes of rotating rotor, made in the form of bilateral impeller of the centrifugal pump. Then the fluid passes through the aperture of a rotor ring and a stator. It provides conditions of cavitation, which ensure intensive heating of fluids. One of the disadvantages of this generator is the rather complex construction of the rotor and the stator and even the presence of the stator. Considering this, effective heating of fluid requires high frequency rotation of the rotor, which in turn reduces service reliability of the heat-generator.

[0004] Another cavitation-vortex heat-generator [3] is similar to the present device in technical essence and achievable results. The cavitation-vortex heat-generator has a body with feed and discharge branch-pipes, a stator installed in the body, two annular disks perforated by through holes, and two rotors installed between the disks of the stator with a gap relative to each other and the disks of the stator are installed on independent shafts having independent drives and rotating in the opposite directions. One of the main advantages of this generator is the application of two rotors with independent drives that allows intensifying heating of liquids, but at the same time, the presence of the stator not only complicates the heat generator's design, but also requires high frequency rotation of the rotor, which in turn reduces the service reliability of the heat generator.

[0005] The technical aim of the present invention is the increase of the liquid heating efficiency due to intensification of the heating process.

[0006] The mentioned technical aim is achieved by a vortex heat-generator having a body (1) with inlet (2) and outlet (3) branch-pipes and rotors installed in the body (1) in the form of two coaxial discs (4, 5) positioned with a gap between each other and positioned on independent shafts (6, 7) having independent drives and rotating in opposite directions characterized in that the internal plane of the discs (4, 5) is equipped with concentric rings (8, 9) having openings (10) positioned on the whole diameter with engagement of the rings (9) of one disc (5) between the rings (8) of the other disc (4), wherein radially directed blades (11 and 12) are installed on the outer surface of the discs (4, 5), wherein the shafts (6, 7) are surrounded by iron rings (13, 14), wherein helical ports (15, 16) are positioned on the shafts (6, 7) along the full length of the contact with the iron rings (13, 14) and an inlet branch pipe (2) is positioned on each of the iron rings (13, 14) in front of the helical ports (15, 16) of the corresponding shaft (6, 7).

[0007] The specified purpose can be achieved by the following. A Section of the prospective vortex heat-generator is shown on the draft below.

[0008] The Vortex heat-generator has a body (1), inlet (2), and outlet (3) branch-pipes, rotors installed inside the body of the heat pump, made in the form of coaxial disks (4) and (5), installed with a gap relative to each other on the independent shafts (6) and (7), having independent drives and rotating in opposite directions. The internal plane of the discs is equipped with rings (8) and (9), with openings (10) positioned on the whole diameter with engagement of the rings of one disc between the rings of the other disc. Radially directed blades (11) and (12) and shafts are equipped with iron rings (13) and (14). Helical ports (15) and (16) are positioned on the shafts along the full length of the contact with iron rings. Inlet branch-pipes (2), are positioned on the iron rings (13) and (14) in front of helical ports (15) and (16) of shafts (6) and (7).

[0009] The prospective vortex heat-generator works as follows:

[0010] The cold fluid, for example water, passes into the chamber A through the inlet branch-pipes (2), at the rotation of shafts (6) and (7) and due to depression originating at the helical ports (15) and (16) and hard contact with inner surface of the inner rings (13) and (14). Then the fluid passes through the helical ports, where rotational fluid motion ensures intensive heating and additional heating due to friction of the contacting surfaces of the shaft and iron rings into the chamber B. Then the warmed-up whirling water hits on the outer side of the discs (4) and (5) and undergoes braking, as rotation of discs is opposite to the rotational motion of the fluid and efficiency of the fluid braking increases due to radial blades (11) and (12). It results in excessive pressure and origination of fluctuation, which in turn results in even more intensive heating and origination of vapor-pressure pockets, which collapse's efficiency increases as a result of acoustic effect, which originates at counterrotation of discs (4) and (5) due to installed rings (8) and (9) with openings (10). Then the intensively heated fluid hits on the peripheral face of the body (1) and can be delivered to the hot water supply or heating systems through the outlet branch-pipe (3).

[0011] The installation of rings on the inner plane of the discs, with openings positioned on the whole diameter with possibility for engagements of the rings of one disc between the rings of the other disc allows creating acoustic effect. Thus, generation of acoustic vibrations

occurs due to the counterrotation of the rings with openings, increases efficiency of vapor-pressure pockets collapse and provides intensive heating of water.

[0012] The radially directed blades installed on the outer surface of the discs form an effective ive rotating detacher of vortex flow, thus providing instant heating of the water due to effective vortex flow braking, pressurization and initiation of pulsations. At the same time, the rotation of the discs in the direction opposite to the rotation of the vortex flow allows increasing the speed of the vortex slow braking, and provides on intensive heating of the water.

[0013] The Equipment of the shafts with the iron rings and the arrangement of the helical ports along the full length of the contact with the iron rings, allow heating the fluid with vortex motion, thus ensuring an additional heating, originating as a result of friction between the contacting surfaces of the shaft and the iron rings. The helical ports generate depression and ensure rather intensive heating of the fluid, simultaneously with the supply of the fluid, and do not require application of a special pump, intended for the supply of the fluid.

[0014] The location of the inlet branch-pipes on the iron rings in front of the helical ports of the shafts ensures supply of the initial fluids without application of pumps.

[0015] The inventive vortex heat-generator allows a considerable increase of energy production efficiency due to vortex motion with subsequent effective braking of the vortex flow, due to the counterrotation of the rotating detacher with the vortex flow with simultaneous acoustic effect.

Sources of the information:

[0016]

1. RU 2186366 C1, F 24 J 3/00, 03.01.2001

2. RU 2159901 C2, F 24 J 3/00, 27.11.2000

3. RU 2269075 C1, F 24 J 3/00, 27.01.2006 (prototype)

Claims

1. Vortex heat generator having a body (1) with inlet (2) and outlet (3) branch-pipes and rotors installed in the body (1) in the form of two coaxial discs (4, 5) positioned with a gap between each other and positioned on independent shafts (6, 7) having independent drives and rotating in opposite directions **characterized in that** the internal plane of the discs (4, 5) is equipped with concentric rings (8, 9) having openings (10) positioned on the whole diameter with engagement of the rings (9) of one disc (5) between the rings (8) of the other disc (4), wherein radially directed blades (11 and 12) are installed on the outer surface of the discs (4, 5), wherein the shafts (6, 7) are surrounded by iron rings (13, 14), wherein helical ports (15, 16) are positioned on the shafts (6, 7) along the full length of the contact with the iron rings (13, 14) and an inlet branch pipe (2) is positioned on each of the iron rings (13, 14) in front of the helical ports (15, 16) of the corresponding shaft (6, 7).

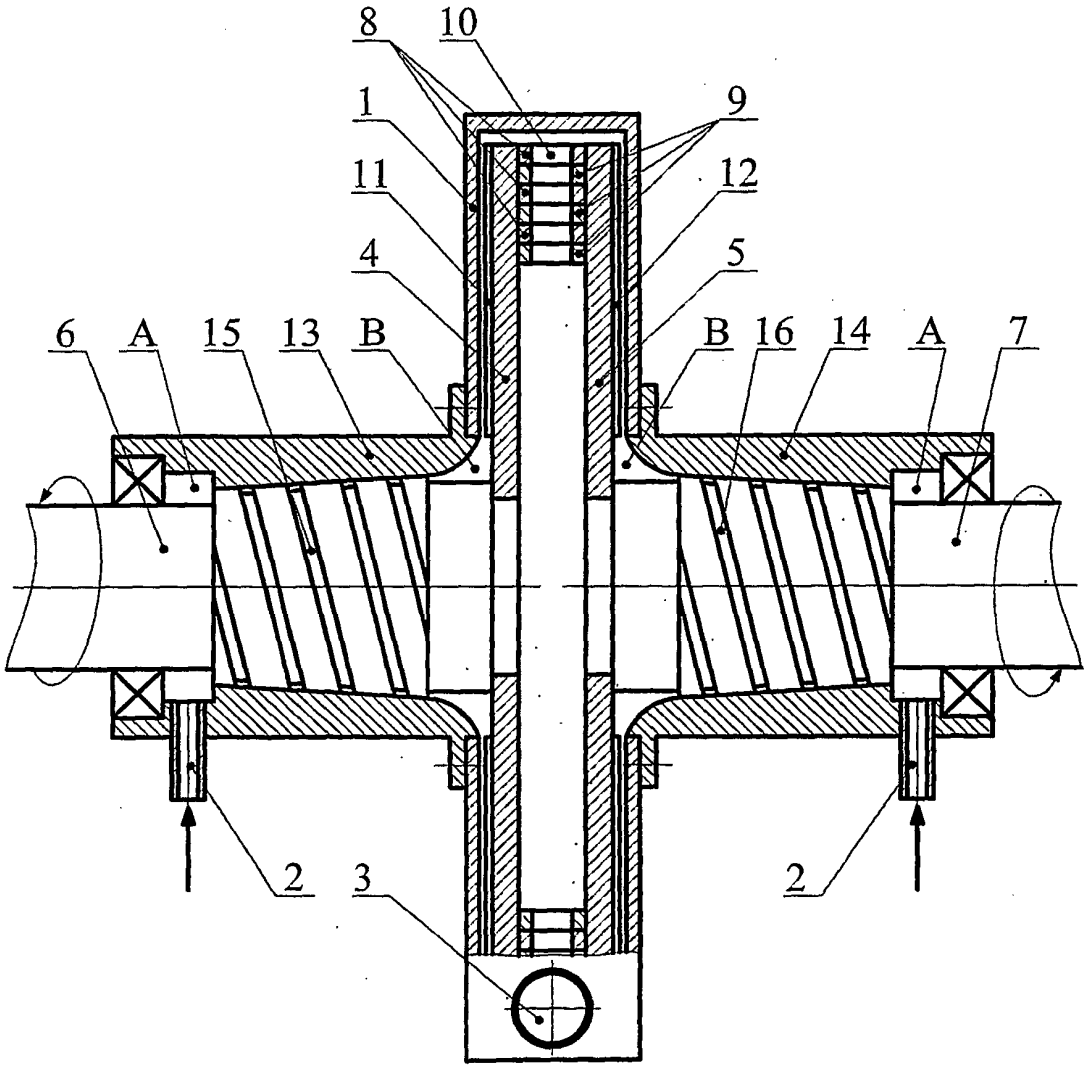
Patentansprüche

1. Wirbelwärmeerzeuger, der einen Körper (1) mit Einlass(2)- und Auslass(3)-Abzweigrohren und Rotoren aufweist, die in dem Körper (1) in Form von zwei koaxialen Scheiben (4, 5) installiert sind, welche mit einem Spalt zwischen einander und auf unabhängigen Wellen (6, 7) mit unabhängigen Antrieben positioniert sind und sich in entgegengesetzte Richtungen drehen, **dadurch gekennzeichnet, dass** die innere Ebene der Scheiben (4, 5) mit konzentrischen Ringen (8, 9) ausgestattet ist, die auf dem ganzen Durchmesser positionierte Öffnungen (10) aufweisen, wobei die Ringe (9) einer Scheibe (5) zwischen die Ringe (8) der anderen Scheibe (4) eingreifen, wobei radial ausgerichtete Flügel (11 und 12) auf der äußeren Oberfläche der Scheiben (4, 5) installiert sind, wobei die Wellen (6, 7) von Eisenringen (13, 14) umgeben sind, wobei wendelförmige Kanäle (15, 16) über die ganze Länge des Kontakts mit den Eisenringen (13, 14) auf den Wellen (6, 7) positioniert sind und auf jedem der Eisenringe (13, 14) vor den wendelförmigen Kanälen (15, 16) der entsprechenden Welle (6, 7) ein Einlass-Abzweigrohr (2) positioniert ist.

Revendications

1. Générateur de chaleur vortex ayant un corps (1) avec des tuyaux de distribution d'entrée (2) et de sortie (3) et des rotors installés dans le corps (1) sous la forme de deux disques coaxiaux (4, 5) positionnés avec un espace entre eux et positionnés sur des arbres indépendants (6, 7) ayant des entraînements indépendants et tournant dans des directions opposées **caractérisé en ce que** le plan intérieur des disques (4, 5) est équipé d'anneaux concentriques (8, 9) ayant des ouvertures (10) positionnées sur la totalité du diamètre avec un engagement des anneaux (9) d'un disque (5) entre les anneaux (8) de l'autre disque (4), dans lequel des ailettes dirigées radialement (11 et 12) sont installées sur la surface extérieure des disques (4, 5), dans lequel les arbres (6, 7) sont entourés par des anneaux de fer (13, 14), dans lequel des orifices hélicoïdaux (15, 16) sont positionnés sur les arbres (6, 7) sur la totalité de la longueur du contact avec les anneaux de fer (13, 14) et un tuyau secondaire d'entrée (2) est positionné

sur chacun des anneaux de fer (13, 14) devant les orifices hélicoïdaux (15, 16) de l'arbre (6, 7) correspondant.



Draft 1

REFERENCES CITED IN THE DESCRIPTION

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