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(54) **Radial fan**

(57) A radial fan consisting of a housing (7) provided with front wall (5), rear wall (3) and inner partition (4) insulated from inside with thermal insulation and an electric motor (1) mounted in said housing (7) and connected detachably with radial turbine (2) located in helical part (12) of said housing, provided with two ports and resting on legs (13) characterised with that outer surface of the fan's housing, specifically cylindrical (7), is provided with mounting holes located along its circumference and specifically in the vicinity of its end faces in which detachably and adjustably, according to needs, resilient supports (9) are mounted provided with legs (13), and at the outlet of helical part (12) of said housing, a sleeve-shaped port is attached. Each of resilient supports (9) is preferably made of spring steel flat in the form resembling a shortened letter "U" with ends of its arms bent outside.

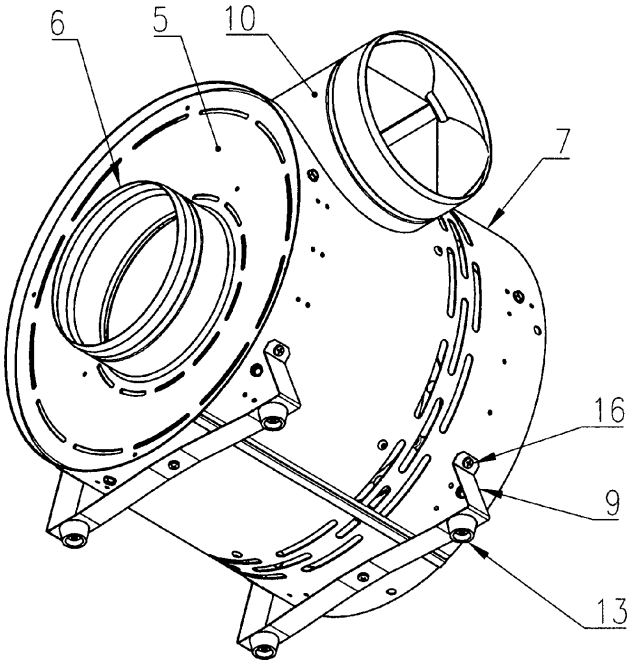


Fig.6

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Description

[0001] The subject of this utility model is a radial fan designed for forcing air into air distribution systems, especially air heating systems and ventilation systems.

[0002] From description of Polish utility model application No. W-97951 it is known a fan consisting of an electric motor stator of which is permanently mounted to the base hub, with fan's centrifugal rotor mounted on said motor's rotor. The fan's base hub is connected with air guides and side surface into a self-contained whole constituting a system guiding the whirling air from side surface to the fan outlet closed with a front wall, while the whole is protected by means of a shield connecting the fan's front wall with its rear wall.

[0003] It is also known a radial fan for forcing hot air having a housing in the form of cuboid, where walls of the housing are provided with ventilation holes and holes used for fan components mounting, and to said housing's side wall, an outlet port is attached. Moreover, a front wall is screwed to the fan's housing containing an inlet port, and to the rear part of said housing there is the rear wall attached to which in turn an asynchronous alternating current motor is mounted. In said motor's chamber there is a mechanical thermostat and a capacitor attached by screws with said motor, thermostat and capacitor connected by means of electric wires. On the motor axis there is a radial rotor fastened and between said rotor and the motor there is a inner partition attached to the housing. In turn, between the inner partition and the front wall there is a coil immobilised and thermally insulated from front wall, middle wall and other housing walls by means of thermal insulation, while the bottom wall has legs attached to it. Ventilation openings made in the housing are used for cooling the motor in the course of its operation, and a thermostat with probe located in the turbine chamber is used to switch the motor on after air in the turbine chamber reaches temperature set on the temperature thermostat and to switch it off when temperature drops below a temperature value set on the thermostat. The capacitor enables operation of the asynchronous alternating current motor, where the feeding cable and electric conductors connecting the thermostat, the capacitor and the motor provide power supply to the motor, while the outlet port is used for connecting the appliance to the fireplace ventilator and guiding air to said ventilator. Further, the helix and the turbine fastened on the motor axis constitute a radial fan and are used for forcing air, and the outlet port is used to discharge air from the fireplace fan to the air distribution system pipe, while legs mounted on the housing's bottom wall are used for positioning the fireplace fan of the ground. Inconvenience of such fan consists in that its legs attached directly to the housing provide insufficient damping of vibrations generated by operating motor and turbine assembly and mounting of the legs to the housing's bottom wall allows to position the fireplace fan in one position only. Apart from that, the known radial fan for hot air pumping is used mainly in systems for distribution of hot air heated up in a fireplace.

[0004] The purpose of this utility model consists in providing a simple design of a fan free from inconvenience consisting in transfer of vibrations generated in the course of its operation and caused by insufficient balancing of rotating components and deposits of dirt occurring in the fan's radial turbine in the course of its operation to the ground. Yet another purpose of this utility model consists in possibility to adjust the fan's outlet port in desired position with respect to the ground.

[0005] The essence of the radial fan design according to this utility model consists in that the outer surface of its housing, specifically cylindrical, along its circumference and specifically in the vicinity of both of its end faces, is provided with mounting holes in which, detachably and adjustably as and when required, resilient supports are mounted provided with legs, and to the end of helical part of said housing a sleeve-shaped port is attached. Each of the resilient fan's supports is preferably made of spring steel flat in the form resembling a shortened letter "U" with end of its arm bent, and legs connected detachably with said supports are made of elastic material, preferably rubber.

[0006] Provision of the sleeve-shaped fan body with mounting openings situated in the vicinity of its flat faces and along its circumference allow to screw the fan's resilient supports provided with legs to said body in different way depending on the required position of the outlet port with respect to the ground. Further, mounting the legs to the fan housing through resilient supports prevents transmission of vibrations generated by operation of the radial turbine as a result of loads caused primarily by unbalanced rotating weights to the ground thanks to elastic deformation of said supports. Yet further, mounting the inlet port in the front wall of the housing allows to connect it favourably with the tube supplying air to the radial turbine chamber.

[0007] The subject of the industrial design is shown in figures, of which Fig. 1 presents the radial fan in front view from its inlet side; Fig. 2 — the same fan in cross section along line A-A shown in Fig 1; Fig. 3 — the same fan in side view from its outlet port side; Fig. 4 — the same fan in cross-section along B-B line shown in Fig. 3; Fig. 5 — the same fan in cross-section along line C-C shown in Fig. 3; Fig. 6 — the same fan in isometric view as seen from side, from bottom and from the outlet port side; and Fig. 7 — the same fan resting on four legs in side isometric view as seen from the outlet port side and in front view from the inlet port side.

[0008] The radial fan according to the utility model is composed of cylindrical housing (7), flat faces of which are obscured with front wall (5) and rear wall (3), and in its inside provided with inner partition (4), while to the rear wall (3) an electric motor (1) is attached, and on its axis protruding outside the inner partition (4) a radial turbine (2) is fastened located in the helical part (12) of the housing (7) provided with mounting holes distributed

along its circumference in vicinity of its both end faces, in which by means of screws (16) resilient supports (9) are mounted provided with two legs (13) each, and between said holes along circumference of said housing there are vents for cooling the electric motor (1). Further, in axial opening of the inlet wall (5), a sleeve-shaped inlet port (6) is fastened, while central part of the cylindrical housing (7) at the outlet of its helical part (12) is provided with the sleeve-shaped outlet port (10) attached thereto and protruding outside, and to the rear wall (3), over the electric motor (1), a wire box (11) is attached containing electric connectors and wires connected to said motor. Moreover, thermal insulation layers (8, 14 and 15) protected from inside with steel sheet shields are attached to internal surfaces of the helical part (12) of the cylindrical housing (7), outlet port (10), inlet wall (5) and inner partition (4). Both resilient supports (9) with legs (13) mounted in holes of the cylindrical housing (7) in different locations depending on the needs of the fan user are made of resilient flats, preferably metal, in a form resembling letter "U" with ends of its arms bent outside.

[0009] The radial turbine (2) powered with electric motor (1), as a result of its rotational motion, draws out air from inlet port (6) and, in the course of its flow along the turbine's rotation axis, gives it kinetic energy and throws out in radial direction towards the internal helix (12) that in turn drives it towards the outlet port (10) and then, through a system pipe (not shown in the figure) connected to said port, outside the fan. In the course of operation of the fan, thermal insulation layers (8, 14 and 15) ensure proper thermal separation of the inner partition (4), the cylindrical housing (7) and the inlet wall (5) from hot air flowing through the helical chamber (12) of the radial turbine (2), while at the same time, slit-shaped vents allow to cool the electric motor (1).

Claims

1. A radial fan consisting of a housing provided with front wall, rear wall and inner partition insulated from inside with thermal insulation and an electric motor mounted inside said housing and connected detachably with radial turbine located in helical part of said housing that is provided with an inlet port and an outlet port and rests on legs **characterised in that** outer surface of its housing, specifically cylindrical (7), is provided with mounting holes distributed along its circumference and specifically in the vicinity of its end faces in which detachably and adjustably, according to needs, resilient supports (9) are mounted provided with legs (13), and at the outlet of helical part (12) of said housing, a sleeve-shaped port is attached.

2. A fan according to Claim 1 **characterised in that** each of resilient supports (9) is preferably made of spring steel flat in the form resembling a shortened letter "U" with ends of its arms bent out.

3. A fan according to Claim 1 or 2 **characterised in that** legs (13) connected detachably with resilient support (9) are also made of an elastic material, preferably rubber.

Fig.1

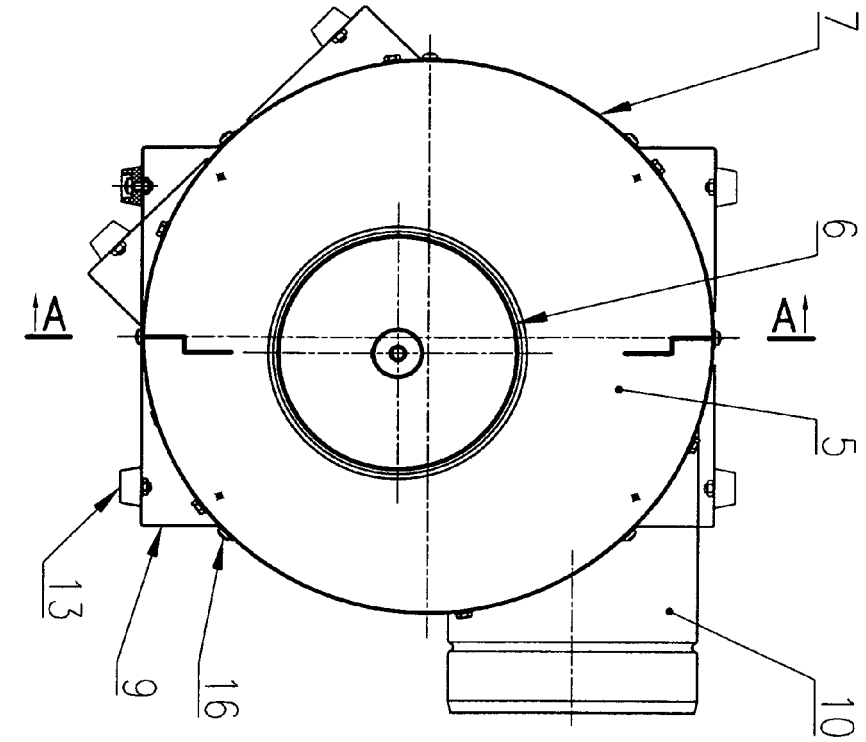
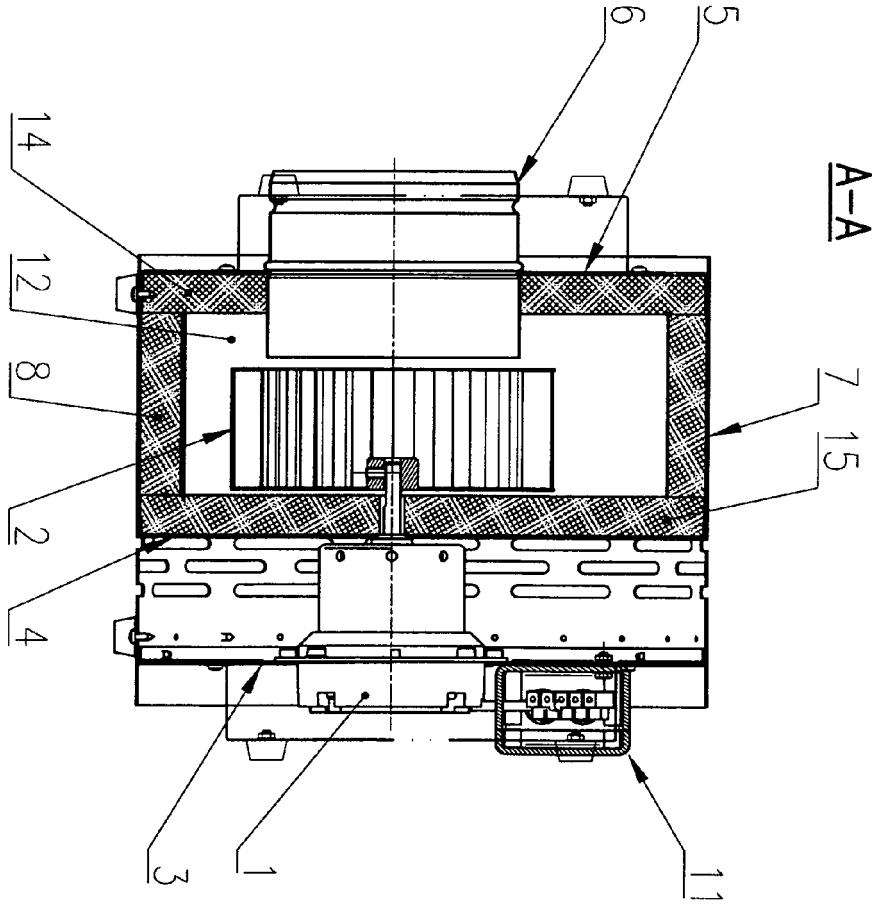


Fig.2



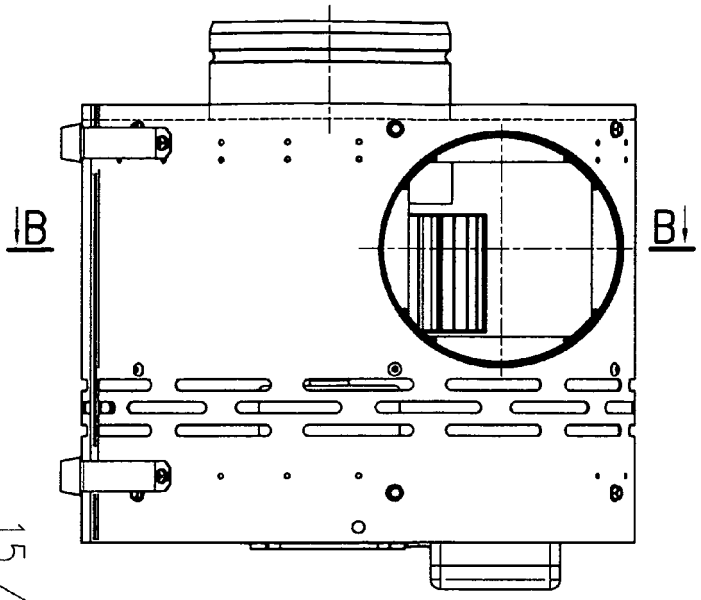


Fig.3

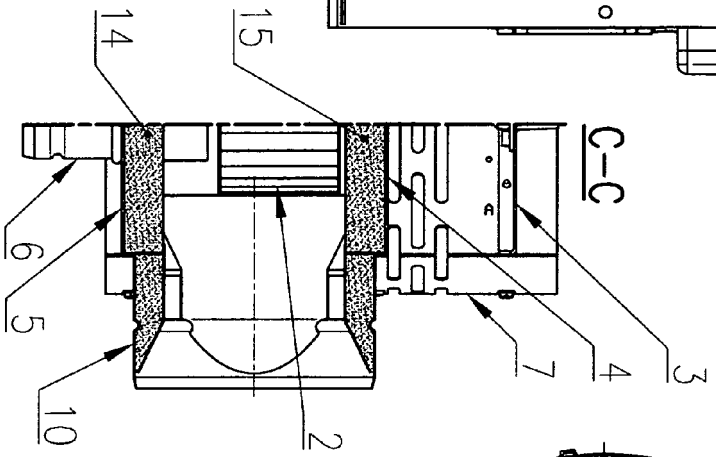


Fig.4

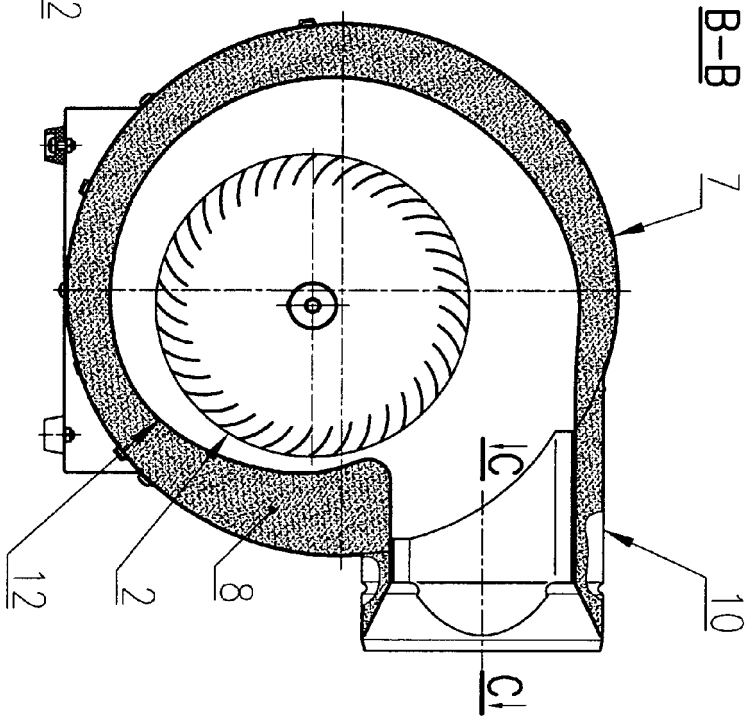


Fig.5

Fig.6

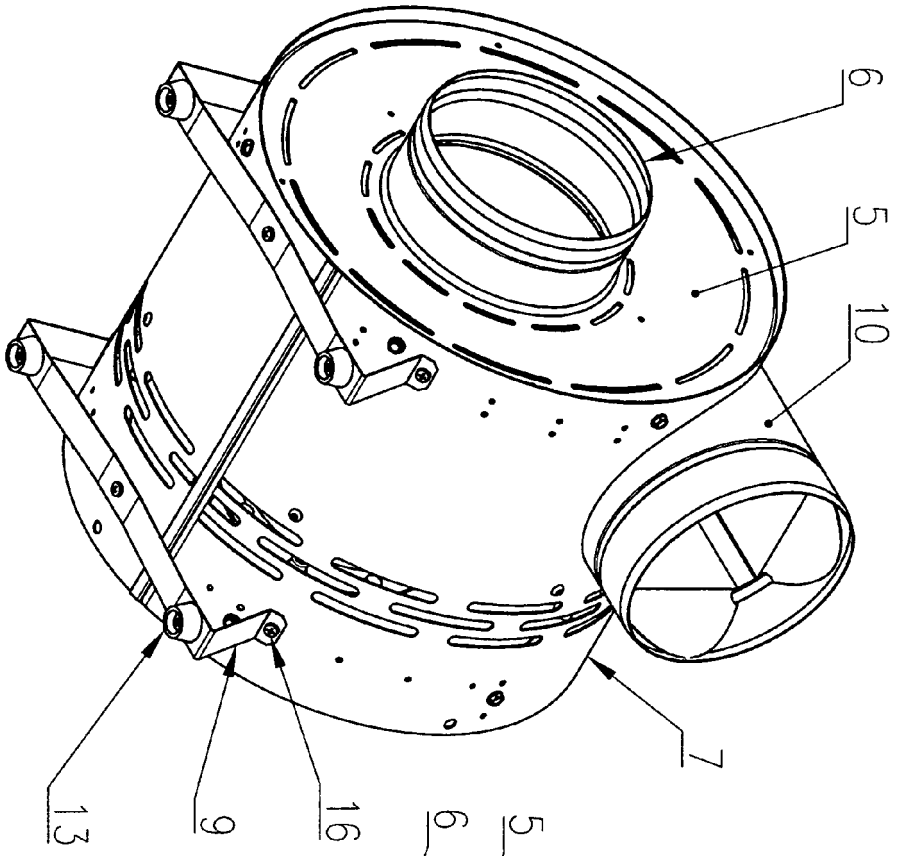
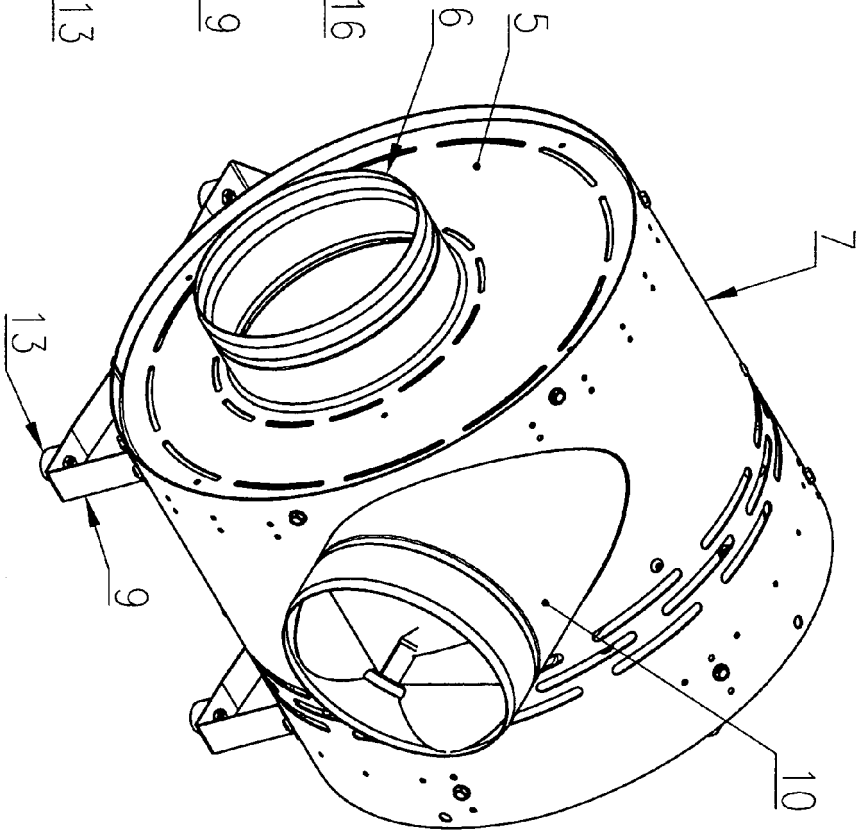


Fig.7



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- PL W97951 **[0002]**