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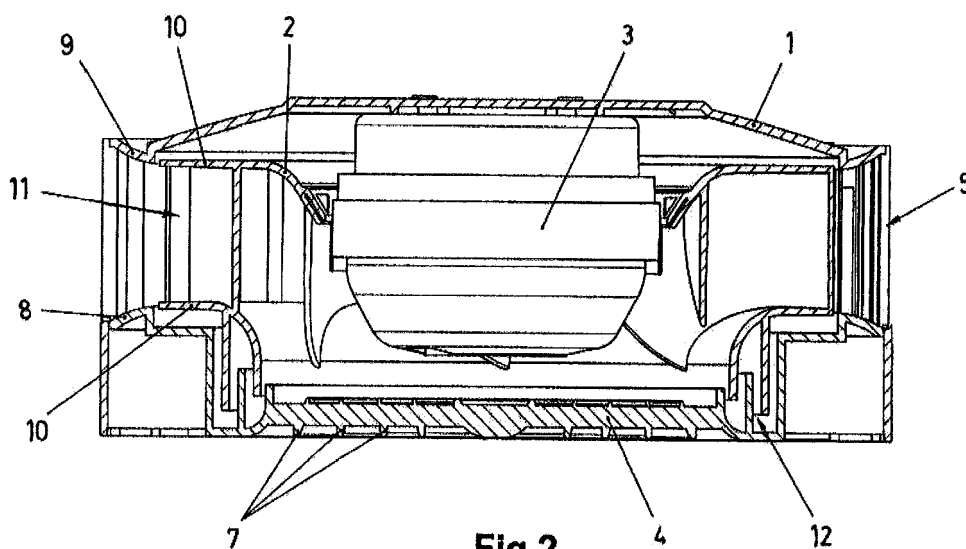
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(54) **Fan case**

(57) The present invention relates to a fan case, formed by a circular-shaped body (1) having an opening (5) in the lateral contour defined between bars having an aerodynamic section oriented with a lateral inclination, there being arranged therein an air impeller (2) associated with a motor (3), whereas in the front part there is arranged a cover (4) in the form of a grating formed by

concentric circular ribs (7) with a varying tapering shape, said cover (4) defining in the peripheral contour, in correspondence with the bottom of the body (1), a mouth that widens outwardly in relation to the opening (5) of the lateral contour, said mouth being a prolongation of an opening (11) of the periphery of the impeller (2) located therein.



**Fig.2**

## Description

### Field of the Art

**[0001]** The present invention relates to fans that are used to prevent the overheating of electronic apparatus such as computers or similar applications, proposing a case for said fans developed with structural features that improve air circulation, and therefore the effectiveness of the heat removal provided by fans.

### State of the Art

**[0002]** Electronic apparatus, such as computers, for example, generate heat when they are operating which heat must be removed in order to prevent the functional components from deteriorating or from experiencing a service life reduction.

**[0003]** Heat removal systems normally consisting of air circulation impeller fans, arranged in the electronic apparatus themselves, are incorporated to remove the heat in the electronic apparatus in order to force outside air to enter the inside of the apparatus and expel the hot air from the inside thereof.

**[0004]** However, the little space that is generally available in electronic apparatus means that heat removal fans arranged therein are very small, so for efficient heat removal said fans have to have certain features that maximally optimize air circulation movement.

### Object of the Invention

**[0005]** According to the invention a fan case is proposed, the embodiment of which fan case has been determined with structural features that favor the entrance and exit of air, thus improving conditions for air circulation through the impulsion of the fan housed therein.

**[0006]** This fan case object of the invention comprises a circular body with the lateral contour open between longitudinal bars having an aerodynamic section oriented with a lateral inclination with respect to the radial plane, there being arranged a cover in the front part of the body defining a grating with concentric circular ribs having a tapering varying from those closest to the center to those on the periphery, said cover determining in the peripheral contour an arched flange facing an opposing arched flange defined by the bottom of the circular body, between which flanges there is defined a mouth in relation to the opening of the lateral contour of said circular body, the walls of said mouth being a prolongation of those of a peripheral opening defined by the impeller of the fan housed in the case.

**[0007]** A fan case is thus provided in which the grating defined by the front cover presents minimum resistance to the entrance of air through the absorption produced by the fan from the inside, whereas the mouth defined in relation to the opening of the circular contour favors the exit of air impelled by the fan, virtually without any head

loss, the laterally inclined aerodynamic bars of the opening of the contour of the circular body also contributing to facilitate the exit of air.

**[0008]** The front cover of the case furthermore forms, in relation to the rotor of the fan, a labyrinth plug-in coupling, leaving the rotor of the fan to rotate freely, but complicating the passage of air, which also prevents head losses through said coupling, in turn favoring the output of air circulation through the case by the action of the fan.

**[0009]** As a result, the proposed case has very advantageous features for small fans arranged in electronic apparatus or similar applications, acquiring its own identity and preferred character with respect to conventional fans of those applications.

### Description of the Drawings

#### [0010]

Figure 1 shows an exploded perspective view of a fan provided with a case made according to the invention.

Figure 2 is a diametral section view of the fan assembly of the preceding figure, now mounted.

Figure 3 is a perspective view of the fan seen from the front part.

**[0011]** Figures 4, 5 and 6 are perspective views seen from the rear part of respective fans provided with cases made according to the object of the invention with different numbers of bars in the opening of the lateral contour of the circular body.

### Detailed Description of the Invention

**[0012]** The object of the invention relates to a fan case, particularly for fans that can be incorporated in electronic apparatus or similar applications, with a structural embodiment that advantageously favors the passage of air for the venting function, comprising a body (1), inside which there is housed an air impeller (2), associated with a rotary motor (3), whereas the front part of the case is closed with a cover (4) in the form of a grating.

**[0013]** The body (1) of the case is circular-shaped and has an opening (5) along its lateral contour for the passage of air, which opening (5) is defined between longitudinal bars (6) having an aerodynamically-shaped section oriented with a lateral inclination with respect to the radial plane, the number of said bars (6) being able to vary from a large number of bars (6) with free, narrow, intermediate spaces between them, like in the embodiment of Figures 1, 3 and 4, to a more or less reduced number of bars (6) with free, wide, intermediate spaces between them, like in the embodiments of Figures 5 and 6.

**[0014]** The cover (4) of the front part of the case in turn defines a grating with concentric circular ribs (7), which have a tapering shape, said tapering varying from the

ribs (7) closest to the center to those on the periphery, as can be seen in Figure 3.

[0015] The cover (4) furthermore determines in the peripheral contour an arched flange (8), which in the mounted arrangement of said cover (4) faces an arched flange (9) arched in an opposing manner defined by the bottom of the circular body (1) of the case, such that between said flanges (8 and 9) there is defined a mouth which widens outwardly in relation to the opening (5) of the lateral contour of said circular body (1) of the case, the walls of said mouth being defined by the mentioned flanges (8 and 9), as a prolongation of the walls (10) of an opening (11) defined by the impeller (2) of the fan in the periphery thereof.

[0016] Therefore, when the impeller (2) is rotated by the motor (3), outer air is absorbed through the front cover (4) and air inside the case is expelled through the opening (5) of the lateral contour of the body (1), giving rise to a forced air passage circulation through the case, which allows effectively removing heat from inside an electronic apparatus or any other means of application.

[0017] For said circulation of the air through the case, the entrance of the air is favored by the varying tapering configuration of the ribs (7) forming the grating of the cover (4), whereas the mouth defined by the flanges (8 and 9) favors the exit of air through the opening (5) of the lateral contour of the body (1) of the case, the aerodynamic configuration and the orientation of the bars (6) of said opening (5) of the lateral contour of the body (1) also helping to facilitate such exit of air.

[0018] On the other hand, the continuity of the flanges (8 and 9) forming the air outlet mouth in relation to the walls (10) of the peripheral opening (11) of the impeller (2) of the fan prevents head losses in the exit path for the air.

[0019] Furthermore, the cover (4) forms with respect to the impeller (2) of the fan housed inside the case a labyrinth coupling (12), as seen in Figure 2, which determines difficulties for the air exhaust passage between the mentioned cover (4) and the impeller (2), in turn preventing head losses through said coupling, but without complicating the functional rotation of the impeller (2), which is left to completely rotate freely.

[0020] As a result, both by eliminating head losses in the entrance and exit paths for the air and because of the conditions facilitating the entrance and exit of air in the case, a very effective circulation of air is achieved with reduced power consumption of the motor (3) moving the impeller (2).

an opening (5) defined between a variable number of longitudinal bars (6) having an aerodynamic section oriented with a lateral inclination with respect to the radial plane, whereas the cover (4) defines a grating formed by concentric circular ribs (7), which have a tapering shape varying from those closest to the center to those on the periphery, said cover (4) having in the peripheral contour an arched flange (8) facing an arched flange (9) arched in an opposing manner defined by the bottom of the body (1), between which flanges (8 and 9) there is defined a mouth which widens outwardly in relation to the opening (5) of the lateral contour, whereas the walls of said mouth defined by the mentioned flanges (8 and 9) are a prolongation of the walls (10) of an opening (11) of the periphery of the impeller (2).

2. The fan case according to claim 1, **characterized in that** the cover (4) forms in relation to the impeller (2) a labyrinth coupling (12) complicating the discharge of air through said coupling, leaving the impeller (2) to rotate freely.

## Claims

1. A fan case, formed by a body (1) in which there is housed an air impeller (2) associated with a motor (3), incorporating in the front part a cover (4) in the form of a grating, **characterized in that** the body (1) is circular-shaped and has along its lateral contour

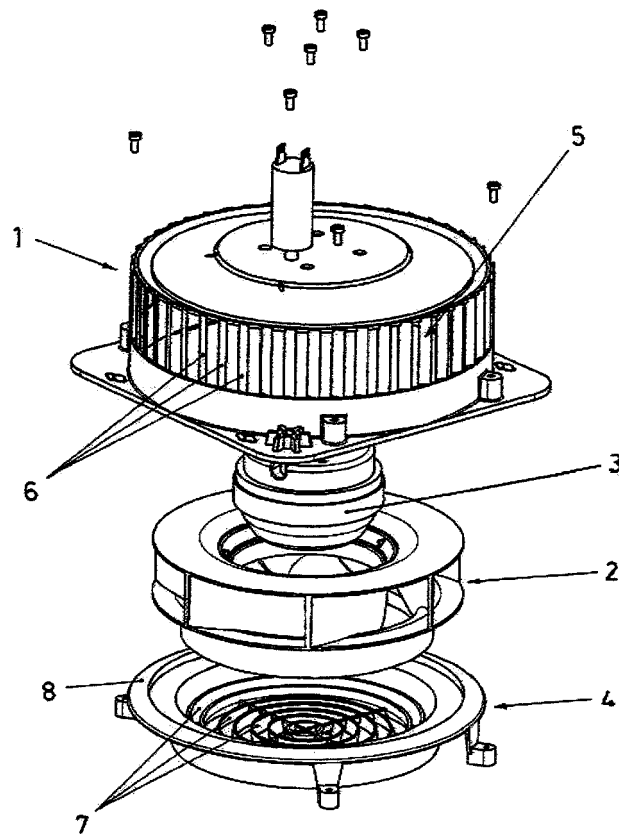


Fig.1

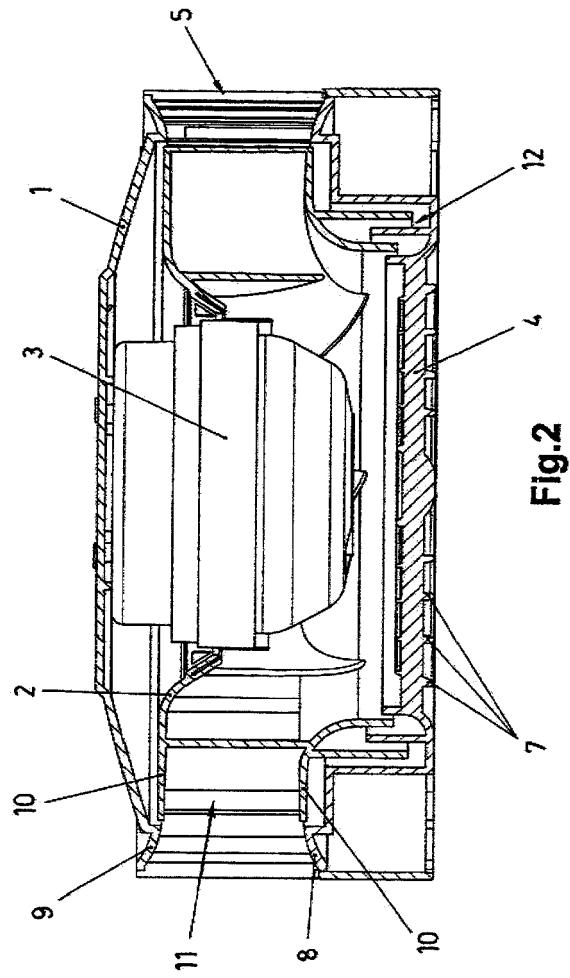
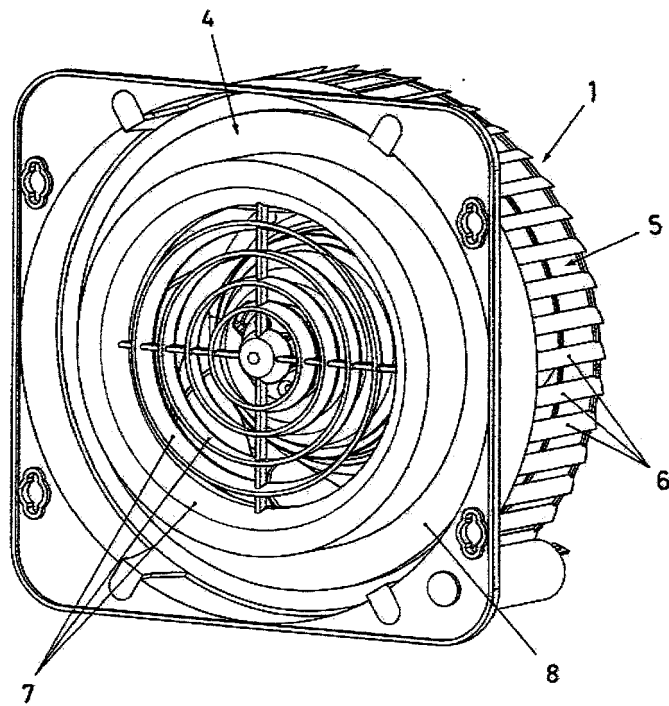
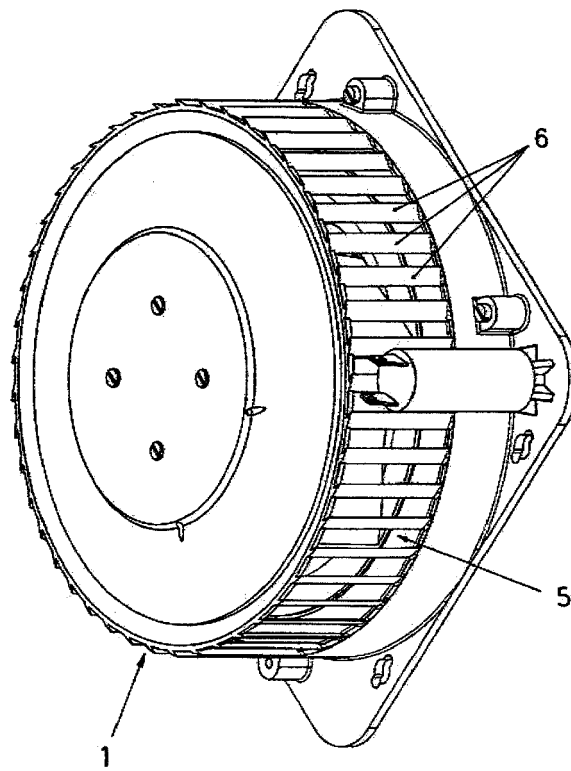


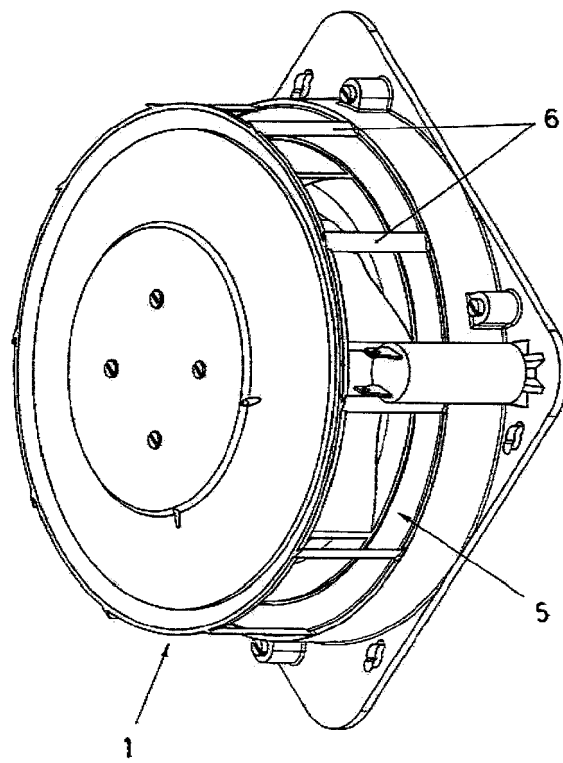
Fig.2



**Fig.3**

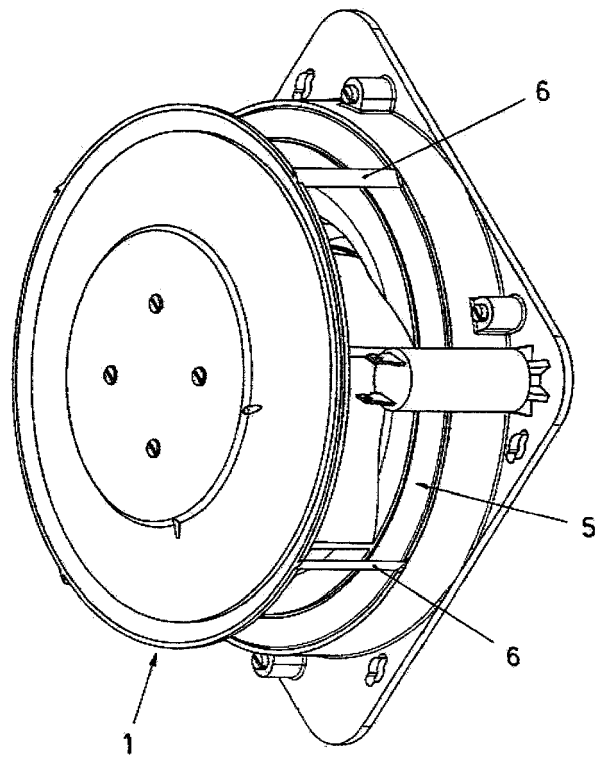


**Fig.4**



**Fig.5**





**Fig.6**



## EUROPEAN SEARCH REPORT

Application Number  
EP 14 16 2817

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