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(54) Air conveying system for internal combustion engine radiators

(57) An air conveying system for internal combustion engine radiators, comprising a radiator, a casing connecting the edge of this latter to a circular hole, and a tube-enveloped fan partly inserted into said hole, its direction of rotation being such that it generates an air flow directed towards the radiator, that edge of the fan-

surrounding tube which is distant from the radiator extending into a portion not containing blades and partly inserted into the cavity of a stationary circular channel positioned at a distance from the hole in the casing which receives the fan.

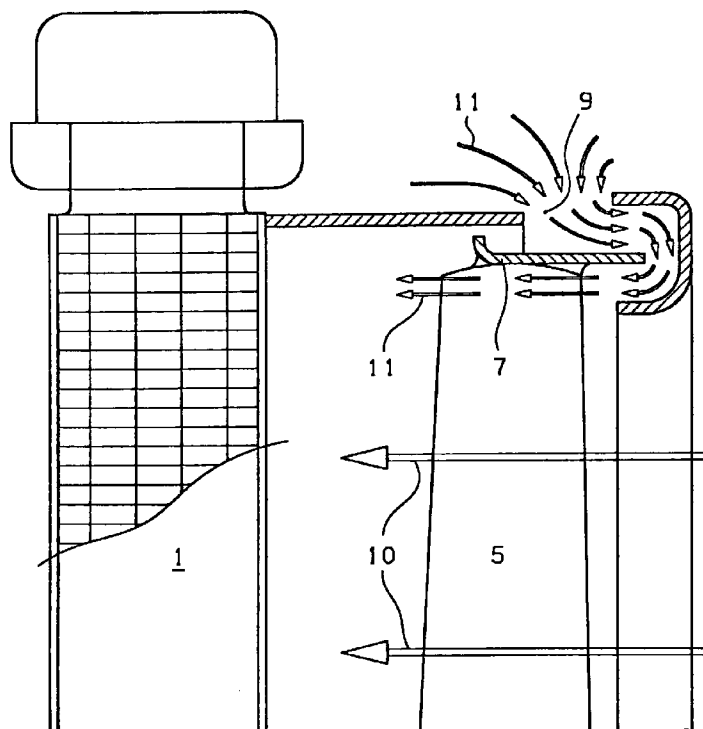


Fig. 2

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Description

This invention relates to a system for conveying the air flow generated by a fan and directed against a cooling radiator, such as the cooling radiator of an internal combustion engine.

To increase the efficiency of the air flow produced by the normal fans coupled to the cooling radiators of internal combustion engines, it has been usual for some time to channel said flow by means of suitable casings.

The fan is positioned generally downstream of or behind the radiator with reference to the vehicle running direction, in order to enhance the air flow spontaneously generated by the vehicle movement.

This arrangement, by which the fan draws air through the radiator, has also generally been used for industrial engines, which being stationary are unable to benefit from any air flow spontaneously traversing the radiator.

As stated, fans which draw air through the radiator are of poor efficiency, this being remedied by encasing them and at least partly tube-enveloping them by providing a cylindrical tube portion fixed to the ends of the fan blades.

This arrangement, which is very efficient from the efficiency viewpoint, has the drawback of being noisy to the point of encountering serious limitations on its application.

This has been remedied by providing a circular channel in proximity to the tube edge to receive the fan, this having largely solved the problem.

The fan draws peripheral external air through the space defined between the edge of the channel and the edge of the tube rigid with the fan blades, this air obviously not having passed through the radiator so that not only is the noise reduced, but also the fan efficiency.

The object of the present invention is to provide a conveying system for the fan-generated cooling air of a radiator, which has high efficiency and noiseless operation.

This object is attained according to the invention by a tube-enveloped and encased fan directing its air flow towards the radiator, its blades being rigid with an outer tube having that edge on the suction side of the fan contained in a stationary circular channel of U cross-section facing the fan.

The operational and constructional merits and characteristics of the invention will be more apparent from the detailed description given hereinafter with reference to the figures of the accompanying drawings, which illustrate a preferred embodiment thereof by way of non-limiting example.

Figure 1 is a partial vertical section through the invention.

Figure 2 shows an enlarged detail of Figure 1.

The figures show a normal radiator 1 of the type used in internal combustion engines, its peripheral edge being provided with a casing 2 which converges in usual manner, not shown, into a hole 3.

A fan 4, the blades 5 of which are fixed to a hub 6, is partly inserted into the hole 3.

To the outer edge of the blades 5 there is fixed, for example by welding or formed integrally with the blades, a tube 7 having that edge more distant from the radiator 1 extending into a portion which is partly inserted into a stationary circular channel 8 having its concavity facing the fan 4.

The outer edge of the channel 8 is conveniently spaced from the edge of the hole 3 of the casing 2 to create a cylindrical aperture 9.

The direction of rotation of the blades 5 is such that they convey air towards the radiator 1.

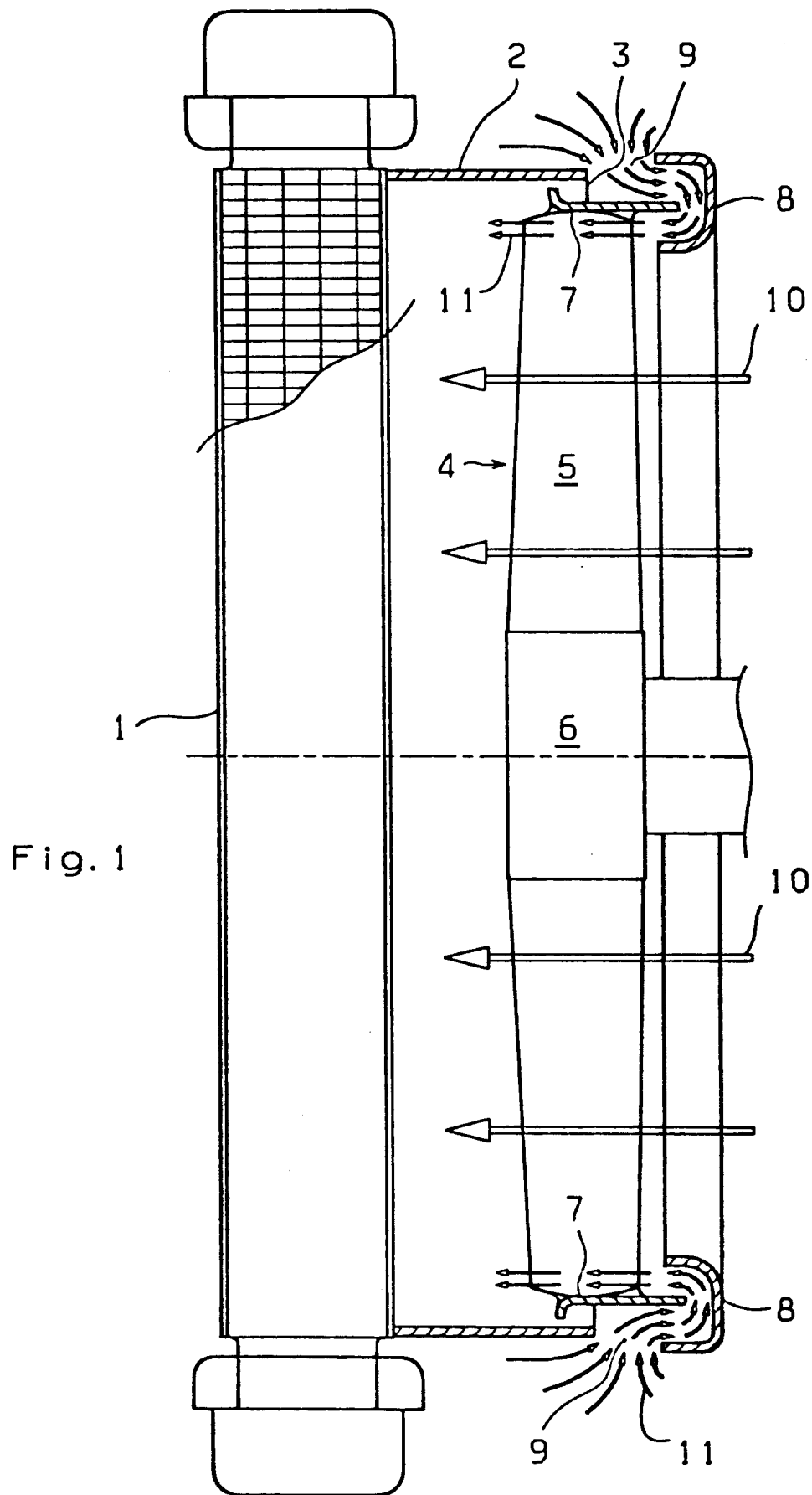
The air conveyed by the blades is drawn partly from the central space of the channel in accordance with the arrows 10, and partly through the cylindrical aperture 9 in accordance with the arrows 11.

All the air conveyed by the blades is therefore directed against the radiator, from which the efficiency of the invention mainly derives.

It has also been surprisingly found that the presence of the secondary air flow conveyed through the channel 8 in accordance with the arrows 11 reduces air turbulence in the region close to the end of the blades, further increasing the system efficiency.

Claims

1. An air conveying system for internal combustion engine radiators, comprising a radiator, a casing connecting the edge of this latter to a circular hole, and a tube-enveloped fan partly inserted into said hole, its direction of rotation being such that it generates an air flow directed towards the radiator, characterised in that that edge of the fan-surrounding tube which is distant from the radiator extends into a portion not containing blades and partly inserted into the cavity of a stationary circular channel positioned at a distance from the hole in the casing which receives the fan.
2. A system as claimed in claim 1, characterised in that said radiator is of square shape.
3. A system as claimed in claim 1, characterised in that said radiator is of rectangular shape.
4. A system as claimed in claim 1, characterised in that the channel is of C cross-section.



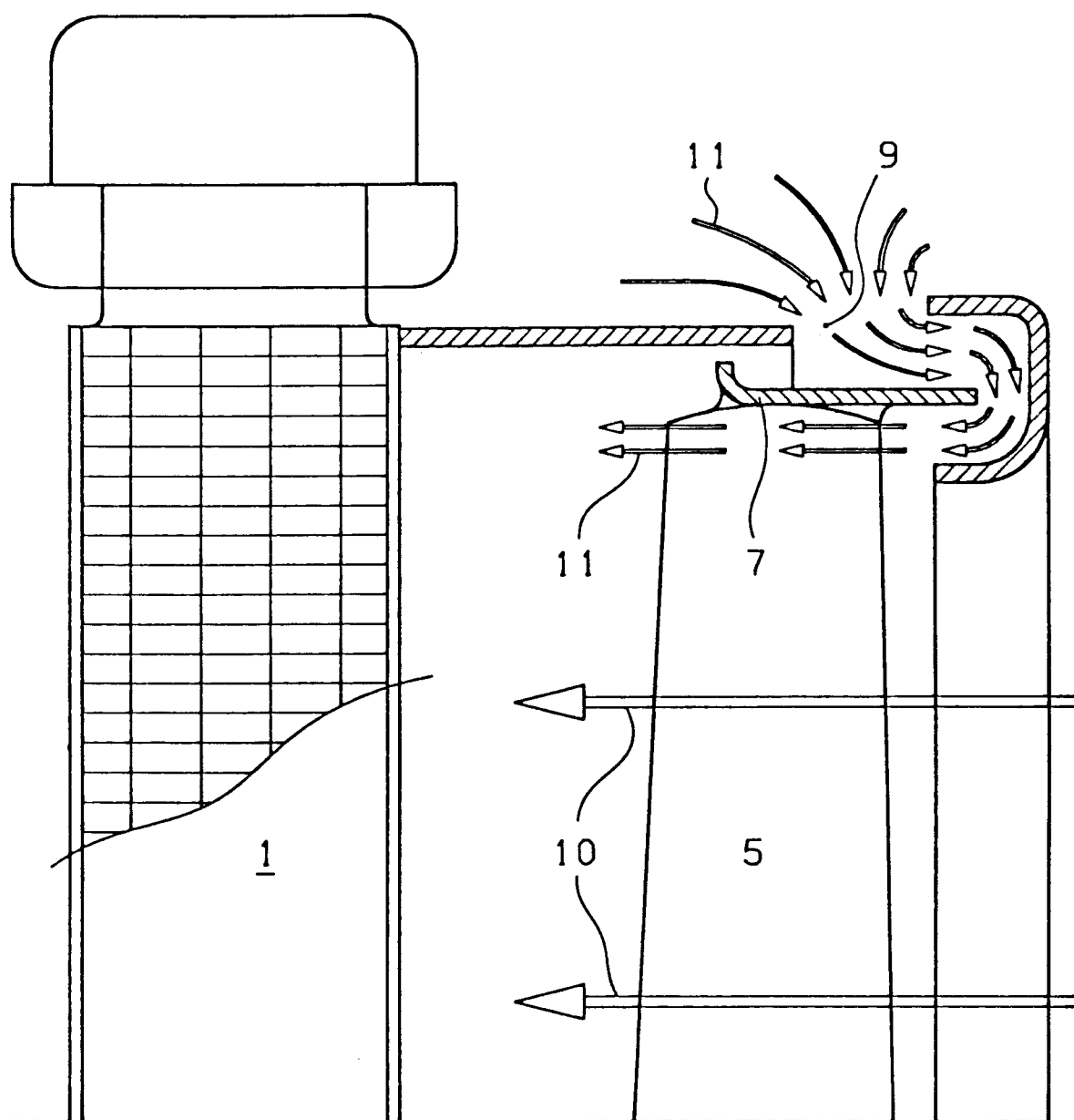


Fig. 2