VENTILATOR WITH REVERSIBLE SYSTEM FOR COOLING AND CLEANING RADIATORS

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ABSTRACT

A ventilator with a reversible system for cooling and cleaning radiators can reverse the blades (1) about the shaft (5) thereof, such that forced air circulation cleans out dust, weed chaff, cereal chaff, sugarcane chaff and other small dirt particles suspended in the air and that end up on or attached to the radiator wings and air inlet grids, thus preventing the entire engine cooling system from heating up.
VENTILATOR WITH REVERSIBLE SYSTEM FOR COOLING AND CLEANING RADITORS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This Application is a CONTINUATION application claiming the benefit of priority of the co-pending International Patent Application No. PCT/BR2012/000017 with an international filing date of 26 Jan. 2012 that designated the United States, which claims the benefit of priority of Federal Republic of Brazil Patent Application No. MU9100274-5, filed 09 Feb. 2011, the entire disclosures of all Applications are expressly incorporated by reference in their entirety herein.

FIELD OF THE INVENTION

[0002] The present utility model relates to a ventilator with reversible system for cooling and cleaning radiators which can reverse the blades about the shaft thereof so that forced air circulation cleans out dust, weed chaff, cereal chaff, sugarcane chaff and other small dirt particles suspended in the air that accumulate or get attached to radiator wings and air inlet grids, thus preventing the entire engine cooling system from heating up.

DESCRIPTION OF THE PRIOR ART

[0003] Ventilators that can reverse the blades are known in the art.

[0004] The previous art can be perfectly characterized by 5 documents:


DESCRIPTION OF THE FIGURES

[0010] This utility model is characterized by means of representative drawings of a ventilator with reversible system for cooling and cleaning radiators in such a manner that it can be fully reproduced by adequate techniques, thus allowing the full characterization of the functionality of the claimed object.

[0011] The descriptive part of the report is based on the developed figures that express the best or preferred mode of executing the product conceived herein through consecutive reference numbers wherein it clarifies the aspects that may be implied by the adopted embodiment in order to clearly determine the protection claimed herein.

[0012] Said drawings are merely illustrative and may vary since they do not depart from what has been initially claimed herein.

[0013] FIGS. 1, 2, 3, 4, and 5 show the prior art; patents granted to HUBER, KARADGY, DINGER, STEINER and McCALLUM, respectively;

[0014] FIG. 6 is a longitudinal section of the ventilator, showing its actuation system.

[0015] FIG. 7 is a cross section, showing the toothed shaft in the rack piston.

[0016] FIG. 8 is an exploded perspective view of the ventilator.

[0017] FIG. 9 is a perspective view of the assembled ventilator.

DETAILED DESCRIPTION OF THE INVENTION

[0018] The ventilator with reversible system for cooling and cleaning radiators comprises a ventilator blade (1), an o-ring (2), a sealing ring (3) a bearing (4), a toothed shaft (5), a gasket holder (6), a gasket (7), an elastic ring (8), a bearing (9), an inner cover (10), a guide pin (11), a compression spring (12), a connecting ring (13), an air duct (14), a rack piston (15), an o-ring (16), an elastic ring (17), a retainer (18), an outer cover (19), an elastic ring (20), a bearing (21), a retainer (22), an elastic ring (23), an air pin (24), an Allen screw (25), and a protection cover (26) of the air duct.

[0019] The ventilator with reversible system for cooling and cleaning radiators (RSV) is made of aluminum for machines with a high torque engine and of highly resistant polymer for machines with a smaller torque engine. Its blades are made by means of a plastic injection system, using a highly resistant polymer.

Object of the Invention

[0020] The object of the ventilator with reversible system for cooling and cleaning radiators (RSV) through its rack piston system and toothed shafts attached to the ventilator shaft is to reverse the blades around their own shaft so that forced air circulation cleans out dust, weed chaff, cereal chaff, sugarcane chaff and other small-sized dirt particles suspended in the air that end up accumulating or getting attached to radiator wings and air inlet grids, thus preventing the entire engine cooling system of the motor from heating up.

[0021] Another object of the RSV is to cool the liquid from the cooling system of the engine by means of the forced air circulation through the radiator wings in order to keep an optimal (stable) temperature, that is, within the normal cooling range determined by the machine and equipment manufacturer.

Detailed Description

[0022] The RSV is used in most modern trucks and agricultural machines in such sectors as sugar and alcohol, civil construction, asphalt pavement, industry, mining, quarries, silviculture, and in all machines fitted with one or more radiators that need to cool the liquid from the cooling system of the motor as well as to continuously clean all kinds of dirt that accumulate in radiators and in their air inlet grids.

[0023] It can also be applied to air conditioning systems that require several air changes a day such as sheds used for breeding poultry, swine and other animals in order to change the air and condition the environment.

[0024] The RSV reversing process occurs as follows: the forward and backward motion of the reversible system of the RSV ventilator is actuated automatically and programmed in seconds, minutes, and hours by an electronic/integrated circuit and compressed air control device.

[0025] Each time the wings of the radiator and its air inlet grid are cleaned, the electronic/integrated circuit control
device actuates the air compressor and a solenoid valve, releasing the flow of compressed air to actuate the RSV.

[0026] The compressed air reverses the ventilator and can be generated by a 12/24 volt electrical mini-compressor installed in the power-generating unit of the machine or equipment or can be drawn from a compressed air tank filled by an air compressor attached to the motor of the machine or equipment.

[0027] Actuating the forward motion of the ventilator reversible system. The compressed air released by the valve flows through pneumatic hoses to the RSV, goes through the air duct (14) and the air pin (24) and into the sleeve of the rack piston (15), which is formed by joining the inner cover (10) and the outer cover (19). The compressed air exerts pressure inside the RSV housing, making the rack piston (15) move, rotating the toothed shafts (5) attached to the ventilator blades (1) around their own axes, making the ventilator blow or exhaust air according to need for cooling and cleaning the radiator of each machine or equipment.

[0028] Actuating the backward motion of the ventilator reversible system. When the solenoid valve allows the compressed air inside the RSV housing to return, the compression springs (12) arranged in the upper part of the rack piston (15) exert a mechanical force, making the rack piston return to the actuation position, rotating the toothed shafts (5) attached to the ventilator blades (1) around their own axes, making the ventilator blow or exhaust air according to need for cooling and cleaning of the radiator of each machine or equipment.

Advantages

[0029] The system keeps radiators and their air inlet grids clean, preventing the engine, transmission and the entire hydraulic system from overheating, thus reducing interruptions at work.

[0030] The system allows radiators and their air inlet grids to be cleaned without needing to stop the machine (motor), which is very important in places with particles suspended in the air, thus increasing the productivity and the useful life of the motor of the machine.

[0031] Greater output and fuel economy due to the continuous radiator and air inlet grid cleaning system.

[0032] The cleaning is done automatically through an electronic control system with no need for manual actuation.

[0033] There are flanges for adapting the ventilator to all models of machines and equipment.

[0034] Easy to install.

[0035] Reduced maintenance and repairs of the air conditioning components.

[0036] Built with a light material highly resistant to impacts and temperature oscillations.

[0037] Low part replacement cost.

[0038] Compressed-air actuation system.

[0039] The system of rack piston and toothed shafts attached to the blades and incorporated into the ventilator provide robustness and quality to the product.

[0040] One of the main characteristics of the RSV is its system of rack piston and toothed shafts attached to the blades and incorporated into it, which makes the entire system lighter and more robust at the moment reversing the RSV blades.

What is claimed is:

1. Ventilator with reversible system for cooling and cleaning radiators which can reverse the blades (1) around their own shaft (5), comprising: a set of blades (1), each one of them having a toothed shaft (5) that extends into the blades and can be properly rotated to the position of ventilation or exhaust due to the rack piston (15) into which the teeth of the shaft (5) of said piston (15) fit; said rotation also being achieved through two large bearings (4) which are arranged in the cylindrical part of the shaft (5) and contain a gasket holder (6) and a gasket (7), containing an o-ring (2) and a sealing ring (3) above the upper bearing, and an elastic ring (8) and a smaller bearing (9) below the lower bearing; the ventilator comprising an inner cover (10) and an outer cover (19) properly joined by a set of screws (25) that fasten the covers one to another, thus keeping closed a set of guide pins (11) arranged in a circular fashion, each of said pins containing a compression spring (12); said ventilator being able to receive compressed air through an air duct (14) and an air pin (24), said pin containing bearings (21), an elastic ring (20-23) and a retainer (22) wherein said air duct (14) is properly fastened to the connecting ring (13) and protected by a protection cover (26), also containing an o-ring (16) that attaches the piston (15) to the outer cover (19), and an elastic ring (17) and a retainer (18).

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