Axial fans as a solution to improve the efficiency of power plants

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The highly desired energy transition from fossil sources to renewable ones will take a long time to complete. During this period, regardless of its actual duration, it is crucial to reduce the amount of fossil fuel used for power generation. One way to reduce the fuel consumption of conventional power plants is to increase their efficiency, mainly by revamping existing plants in operation. In fact, most existing plants are designed to last for many more years and shutting them down would be a highly inefficient solution. Therefore, while investment in new plants should aim to overcome the need for fossil fuels and to decarbonize power generation, old plants should preferably be upgraded with low-cost interventions.

Although it may seem strange, a quite important role in improving the efficiency of the power plant as a whole is played by the cooling system, and in particular by the fan.

Cooling systems usually employ large-diameter axial fans (up to 20 meters in some cases) to dissipate the large amounts of heat generated by the power plant.

Although the axial fan has a very long history, there is still room for improvements. To do this, manufacturers of industrial axial fans are faced with the challenge of investing in research and development on a product that customers themselves perceive as a commodity and for which they are therefore initially willing to pay a relatively low price.

In such scenario, patent protection is a highly recommended solution for protecting investments. From the point of view of patent protection, the difficulty in this field is to be able to characterize novel fans effectively, so as to distinguish them from all those that have been described and made available to the public over the decades. Given the long history of this machine and the wide range of uses for which it has been adopted, it is quite common to find one old and ineffective solution that bears some apparent resemblance to the more innovative and high-performance solutions that today can provide some percentage points more in terms of efficiency. Differences can be hidden in the manufacturing process, in some aspect of aerodynamics or in some other apparently minor detail. Thus, machine-specific experience, engineering knowledge and patent skills must work together in synergy to meet these challenges.

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