Turbine engine case through a review of several components

Engineering

Turbine engines have been continuously improved in robustness and mechanical functionality over the last two decades (Mattingly, 1996). It has at least one moving part, a rotor that has a drum that has blades attached to it. The moving fluid acts upon the rotor blades such that they gain rotational energy and are set in rotary cycles. The earliest uses of such engines were in water mills and windmills. Although most modern components of a modern turbine engine were missing in the traditional prototypes, the mechanism of operation has remained closely similar to the traditional turbines (Treager, 1979). There have several major enhancements to the manner in which turbine engines operate with each modification being targeted toward a particular mechanical vehicle. All turbine engines have a set of specific components. The engine consists of the following parts: inlet, fan, compressor, combustor and nozzle, combustors, compressor stators, shaft and ducts. For a turbine engine to be activated, there needs to be a form or fluid such as water, steam or gas. The rotor blades require having a casing around them to control the fluid jet. The inlet is located in the front part of the engine. At the rear end of the engine is a compressor which acts to increase the pressure of the gas through a small area. The compressor is connected solidly to the entire engine. The shaft is centrally located in the engine has many rows of blades called rotors. A burner is located between the compressor and the path of fluid flow (Mattingly, 1996). The fluid has both potential and kinetic energy. There are primarily two modes of operation for turbine engines: impulse based operation and reaction based operation. Many modern turbine engines employ both concepts. In impulse turbine engines, the fluid spins the blades and looses most of its potential energy. However, due to normally low potential energy in most naturally flowing turbine fluids, the potential energy has to be changed to kinetic energy by forcing it through nozzles hence increasing the velocity of the same. These are impulse engines and they typically do not need to have guiding casements since the nozzle acceleration creates a jet capable of overcoming the force of gravity that might otherwise disperse the moment (Tanimura, 2013). Reaction concept turbine engines are fundamentally different from impulse ones in that torque develop out of fluid reaction. In this mode, the entire turbine engine must be fully submerged in the fluid, therefore, requiring the blades to be encased so as to guide the fluid on the blades. As an example of a dual mechanism in the same engine, the steam turbine engine has always been impulse based but gradually have been added reaction based designs. In low pressure the steam expands in volumetric size, the blade adopts reaction mechanisms while its base remains impulse based. With the increased volume, the height of the blade increases, causing the blade base to spin at a lower speed than the tip (Mattingly, 1996).