
A Downwind Windmill

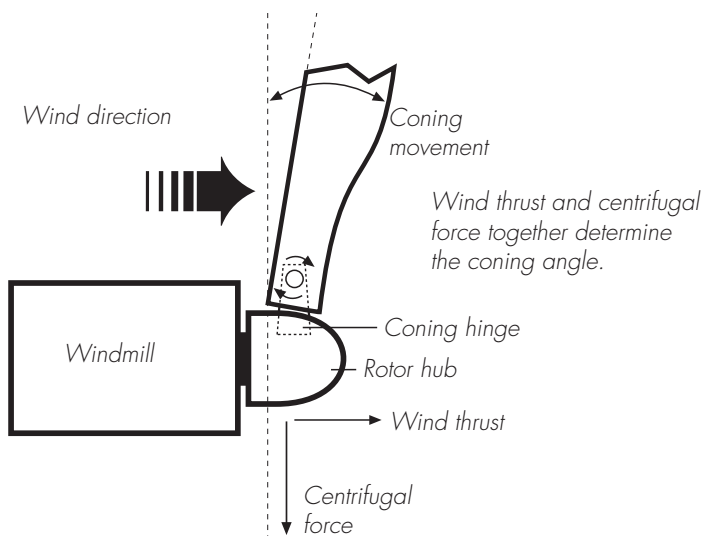


Fig. 3.14 This design has coning hinges on the blades.

'freedom' is to remove all the bending stresses at the blade root. Being downwind of the tower, the rotor passes through the tower wake, so the blades lose most of the wind thrust force once per revolution. This continuous wagging can cause the blades to snap off at the roots.

Coning hinges are also used on single bladed rotors, together with a counter-weight. Coning freedom is not such a good idea for upwind rotors, as sudden gusts can push them back into the tower.

Another advantage which is claimed for the downwind rotor is that it can be 'free yawing'. It is not easy to put a tail on one of these machines, nor is it necessary, if all is well. Under certain conditions of tip speed ratio, however, a downwind windmill may decide to run upwind. This is very difficult to explain, but impressive to watch, when it happens.

Vertical axis machines

We have already looked at one vertical axis wind machine in this chapter: the drag machine which took over from oxen. A similar design is still used for anemometers (instruments which