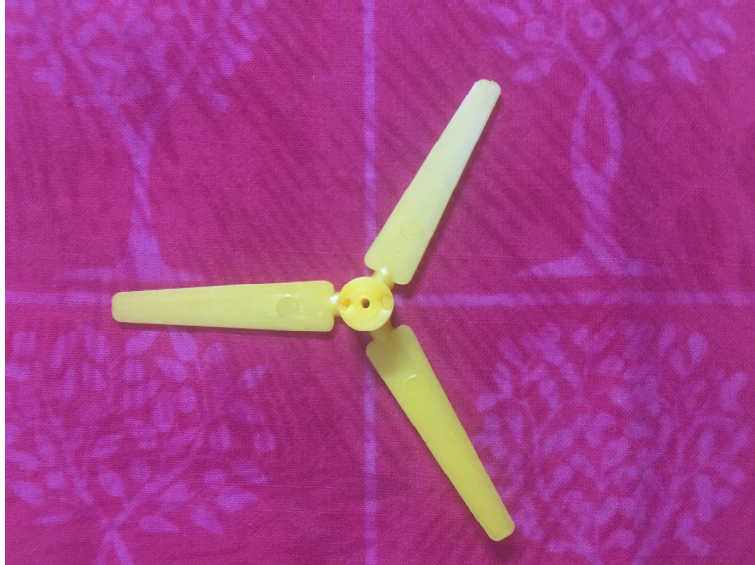
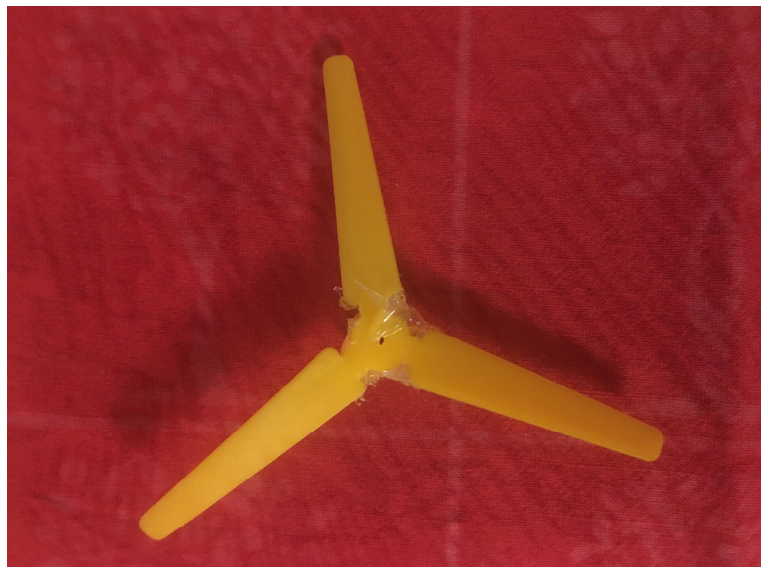
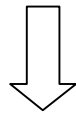


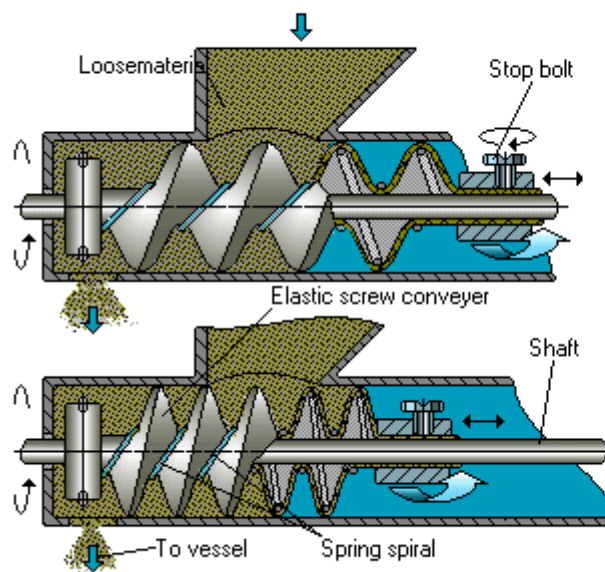
Pitch-settable Fan



Pitch adjustable fan : Neutral state



Pitch adjustable fan : Pitch set and sealed with glue-gun



VARIABLE PITCH SCREW CONVEYER

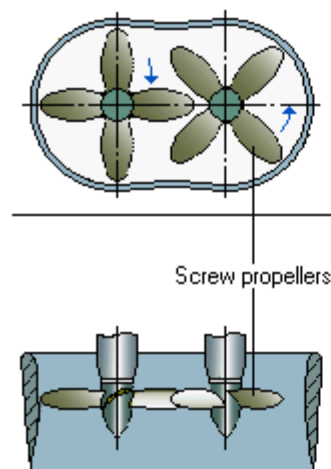
A conventional lifter for loose material, such as mineral fertilizers or chemicals, is formed as a screw conveyor. It is desirable to somehow adjust the **pitch** of the conveyor screw surface to better control the feeding rate of the material and to adjust for various densities of loose materials.

It is proposed to use the principles of variation of parameters and variability (dynamism) to design the conveyor. The screw surface is made of an elastic material such as rubber. Two spring spirals on the external and internal sides of the elastic control the shape of the screw. By loosening a bolt on either end, one can reduce or increase the **pitch** of the screw. The springs are stretched or compressed along the rotating shaft to control **pitch**. This enables the feed rate of loose material to be controlled.

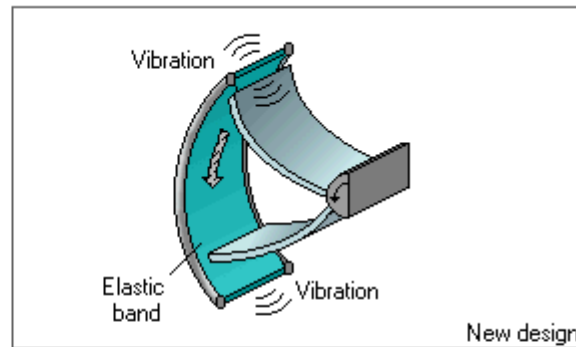
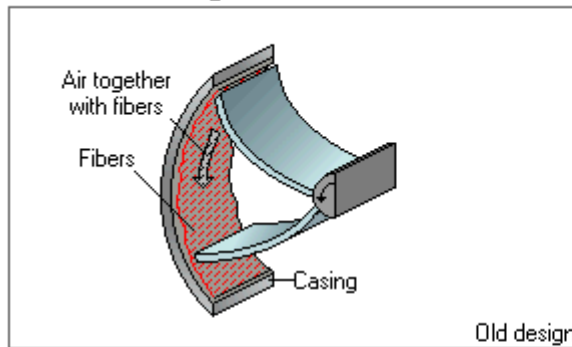
OPTIMAL ARRANGEMENT OF SCREW

In marine vessels, the arrangement of two screw propellers on parallel shafts can waste space.

It is proposed to use the principle of nested dolls to make the propeller arrangement more compact. The shafts are positioned and synchronized in rotation such that the **blades** of each screw will intermesh. As a result, the engine compartment dimensions can be reduced.



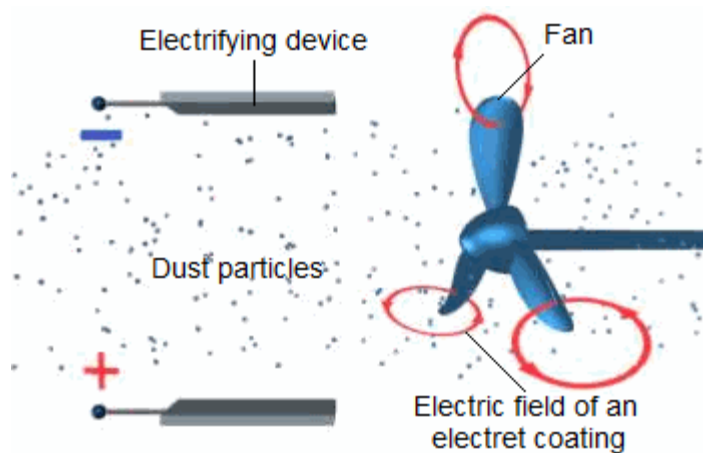
Elastic Fan Casing



Air, together with dust and plant fibers, passes through a fan. The fibers gradually stick to the fan casing from the inside.

Disadvantage: It is necessary to remove the stuck fibers. To do this, the entire fan casing must be disassembled.

It is proposed to make the fan casing a rigid frame with an elastic band. When the fan operates, the band vibrates, and fibers do not stick to it.



Fan blades are covered by an electret coating. An electrifying device is positioned in front of the fan. When the fan operates, the electrifying device charges the dust particles. The electric field of the electret coating deposits the dust particles on the fan blades. The deposited particles form a protective layer. New dust particles deposited on destroyed spots continuously restore this layer. This increases the wear resistance and service life of the fan.

All experiments herein executed courtesy resources (physical kit) and expert training provided kindly by Royal Academy of Engineering, the UK.