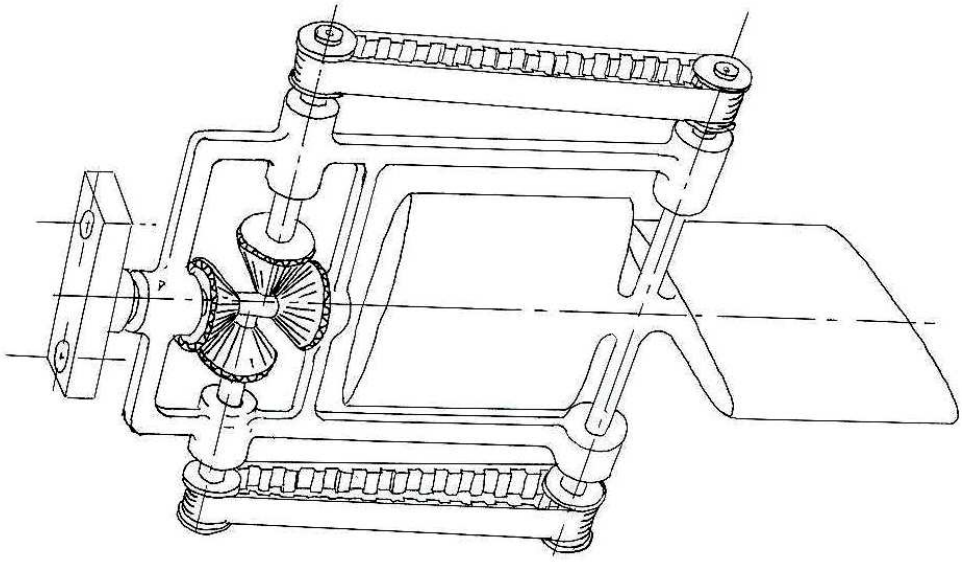
ROTARY BI-PLAN WIND TURBINE **Notice of the** 13/02/2009

by : **Pascal HA PHAM,** Inventor & **SYCOMOREEN,** in charge of the scientific survey of the concept

Contrary to the tri-blades wind turbines, the rotary bi-plan wind turbine uses the **impact of the wind on 2 blades at 90° turning along 2 orthogonal axes and around a fixed point**.

Animation and video available in date of february, 9th 2009 on
http://sycomoreen.free.fr/syco_annonces.html

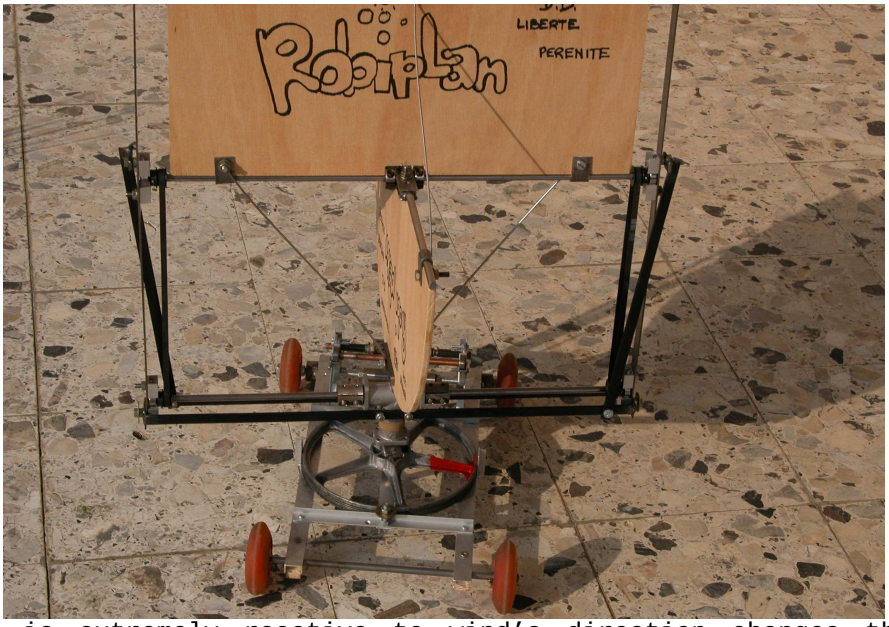


ADVANTAGES

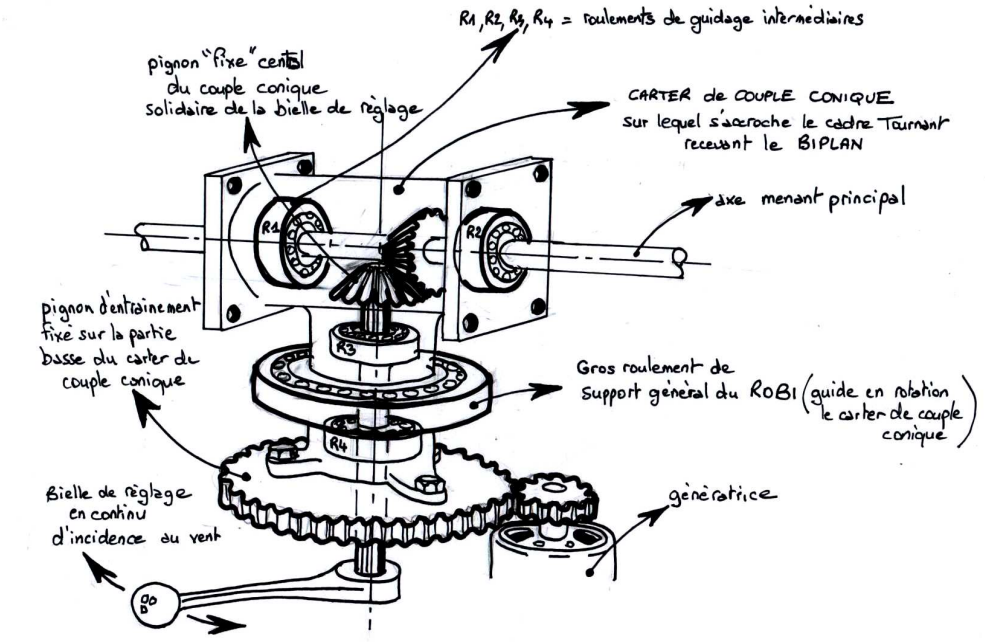
- **The engine converts as well slow winds** (several m/s) **than fast winds** (up to 50 meters per second).
- It is **very small and compact** and thus well designed **for urban and dwellings applications as home's wind turbine.**
- It can **easily be integrated on a boat** and supply **propelling power to sail against the wind :** see about this issue the notice of december, first, 2008 dedicated to **ROBIMOV'IT** on :
  http://sycomoreen.free.fr/syco_annonces.html
- It works **in very hostile surroundings** (marine, storm winds, polar winds)
- The mechanics and the electrical generators are placed on the ground : **therefore it puts the G center lower and makes the maintenance and protection of the electromechanical plant more easily**.
- It has **many arrangements and versions** for the supports, the shapes, the materials (textiles, wood, metals, composites, carbone, kevlar, etc)
- It is extremely **reactive to wind's changes** (in intensity and/or in direction)
- When it is running without charge, **the flexions and tractions applying to the structures are moderated**, whereas the tri-blades wind turbines where important strengths impose to discharge or stop the engine.

THE MOTION ?

A biblade, composed with 2 orthogonal blades rotates around a first horizontal axis, and this axis is turning simultaneously around a second vertical axis, at the same angular velocity, according to a kinematic device composed by conical gearing (1/1 ratio) and transmissions with notched strap (or chain) mounted on a setting, a pitchfork, a mat or a gallows.



The engine is extremely reactive to wind's direction changes thanks to a special device optimizing the wind's incident angle :



SCIENTIFIC ROOTS OF THE MOTION

The standards displacements, the curves and basical motions were discovered from the 17th century by famous scientists : VIVIANI, ROBERVAL, BERNOULLI, PAPPUS. No one seems to have performed it in any kinematics or engines, especially in wind turbines (still waiting for the conclusions of the anteriorities' research started a few months ago, after the deposit of the concept at the INPI's french patent organization)

The Inventor discovered the scientific roots of the engine quite after having experimented his first prototypes and observed that points of the blades were moving according to a « crossed banane » motion on a spherical fictive shape (the motion's envelope).

LIBRARY OF SCIENTIFIC LINKS

Toward the Viviani's window :
http://www.mathcurve.com/courbes3d/viviani/viviani.shtml

Toward the Pappus' Clelies :
http://www.mathcurve.com/courbes3d/clelie/clelie.shtml

Toward the Jacques BERNOULLI's lemniscate
http://www.mathcurve.com/courbes2d/lemniscate/lemniscate.shtml

RESEARCH AND IMPROVEMENT

Since about one year, prototypes have been built and their working really finely observed : it appears that **the engine has undoubtly qualities to convert low wind speed** (under 5 m/s),

The Inventor has notably discovered that **ROBIPLAN is operational to propel mobiles** by launching a successfull test on a small rustic kart which has run in a complete autonomous way, facing the wind and taking its power only from the wind with a single ROBIPLAN.

In december 2008, a first scientific survey was published by SYCOMOREEN and theorically confirms this feature.

In february 2009, a second SYCOMOREEN's survey, focusing on the evaluation of wind output based on a mathematical modelling, computes that the output of a single ROBIPLAN is about 20%.

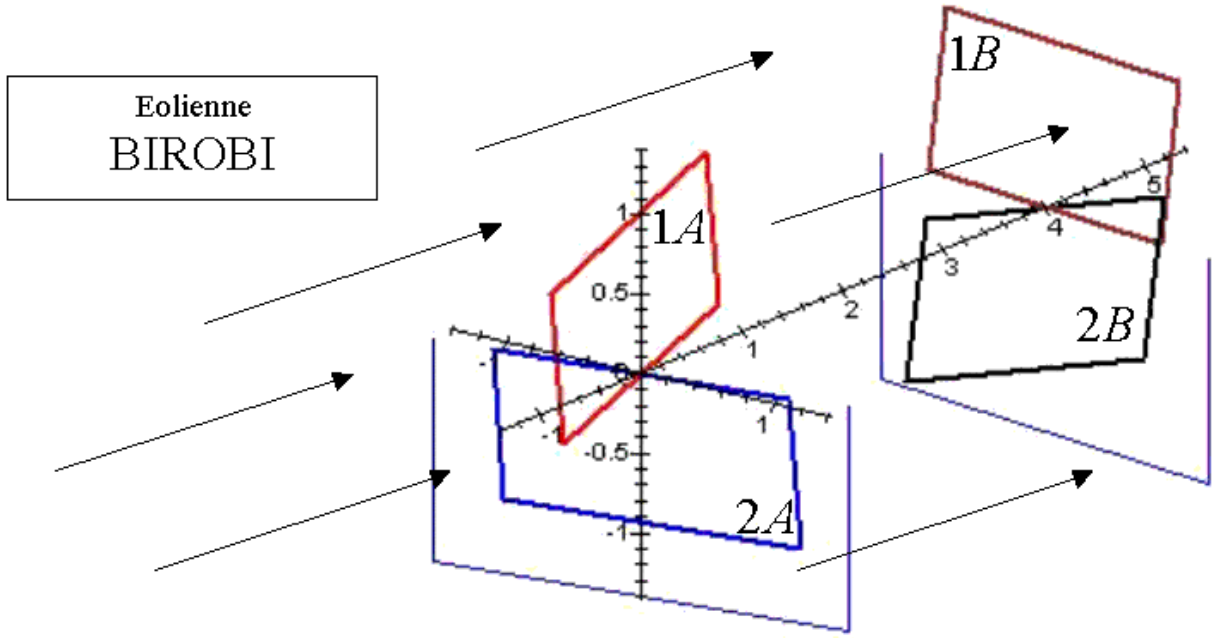
However, **this same survey is showing that to put 2 turbines in serie (BIROBIPLAN)**, with their cycles well synchronized, **gives an improved output of 35% :** this performance is near the one of tri-blades wind turbines, and would allow to a BIROBIPLAN a yearly production equal to for windy site at 10 m/s average spedd, and greater than tri-blades for more windy sites (>10 m/s).
See animations :
http://www.thewindpower.net/forum/topic851-30.html?sid=a7d790540727f8bafd26d3783549a97c
Thus, **scientific analyses confirm the experimental observations on ROBIPLAN's concept, and justify to launch a second experimental step situated in bellows.**
The Inventor is seeking institutions/companies interessed by this second experimental step.

Scientific notice about ROBIMOV'IT
http://sycomoreen.free.fr/Pascal_HA_PHAM/Robi_movit/ROBIMOVIT_note_sci_eng.pdf

Scientific survey about ROBIPLAN's output and performance
http://sycomoreen.free.fr/docs_multimedia/ROBIPLAN_rendements_eng_.pdf

[written by the Professor Raymond VINCENT for SYCOMOREEN SARL]

BIROBI Wind Turbine :



GOALS ET PERSPECTIVES

To build other more computed and perfected **prototypes** in order to make powerful engines of demonstration **in several fields** : **generation of electricity** in marine or terrestrial surroundings.

To build **prototypes designed to be tested in bellows** in order to compare the practice with the theorical computations.

To make **prototypes of compétition** of preference designed to propel terrestrial engines in order *to take place in races like* **the one won by *University of STUTTGART* with its vehicle called « *Ventomobile* »**

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http://sycomoreen.free.fr