

## EXTERIOR MODULAR NATURAL VENTILATION SYSTEM FOR SLOPING ROOFS

### DESCRIPTION OF THE INVENTION

The need to optimize occupation in detached buildings and the attics of multi-family housing units and to make use of spaces under roofs which were traditionally reserved for other activities is becoming increasingly important. One problem with these covered spaces is that temperatures tend to be very high as a result of direct radiation.

In contrast with more costly energy solutions such as climatization through cooling, this invention proposes a passive solution for extreme thermal conditions. The patented modular system allows ventilation in sloping roofs to dissipate the heat from solar radiation, thus avoiding the problems of traditional roofs where heat is transmitted directly through the construction materials to the inhabited space.

The module is comprised of at least one structure that is long and flat with an inverted "U"-shaped section. This shell is designed to be joined to the structural elements of the roof and to create a space through which air can flow between the upper face of the structure and the roof. This allows the cooling advantages mentioned above to be obtained.

Several interlocking shells are used to cover the whole roof. These include eaves with multiple

openings designed to let air through and ridge pieces which are also designed to allow air flow. Both the eaves and ridge pieces have fittings which allow them to be attached to the structure.

This enables air to enter through the openings in the eaves, flow through the free space created by the shells in the roof and exit via the openings in the ridge pieces. This free flow of air through the roof allows the inhabited area of the building directly below the roof to cool, thus improving comfort conditions for people in these spaces.

The technology proposed represents a construction solution consonant with habitability, maintenance and contemporary construction, and has a positive effect on the energy efficiency of buildings. In addition, the invention follows the criteria for the material conservation of historic buildings, monuments or buildings to be preserved as heritage, which have undergone or may undergo a change of use. In this respect, the installation of the module is low-impact and does not cause irreversible damage to the base material.

### SECTORS FOR COMMERCIAL APPLICATION

The technology is useful for the industry in the sector materials and solutions for construction and rehabilitation of buildings.

### TECHNICAL ADVANTAGES AND COMMERCIAL BENEFITS

The main advantages offered by this technology are:

- Improves energy performance in the building.
- Can be installed in sloping roofs.
- Simple manufacturing process.
- Easy assembly.
- Complies with energy efficiency legislation.
- The main innovations offered by this technology are:
  - Application to the restoration and rehabilitation of roofs, particularly those of historic value.
  - Low impact installation which causes no irreversible damage to the material.
  - Eliminates the need for high energy costs in active conditioning solutions.

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**STAGE OF DEVELOPEMENT OF THE TECHNOLOGY**

The technology is fully developed in its design phase

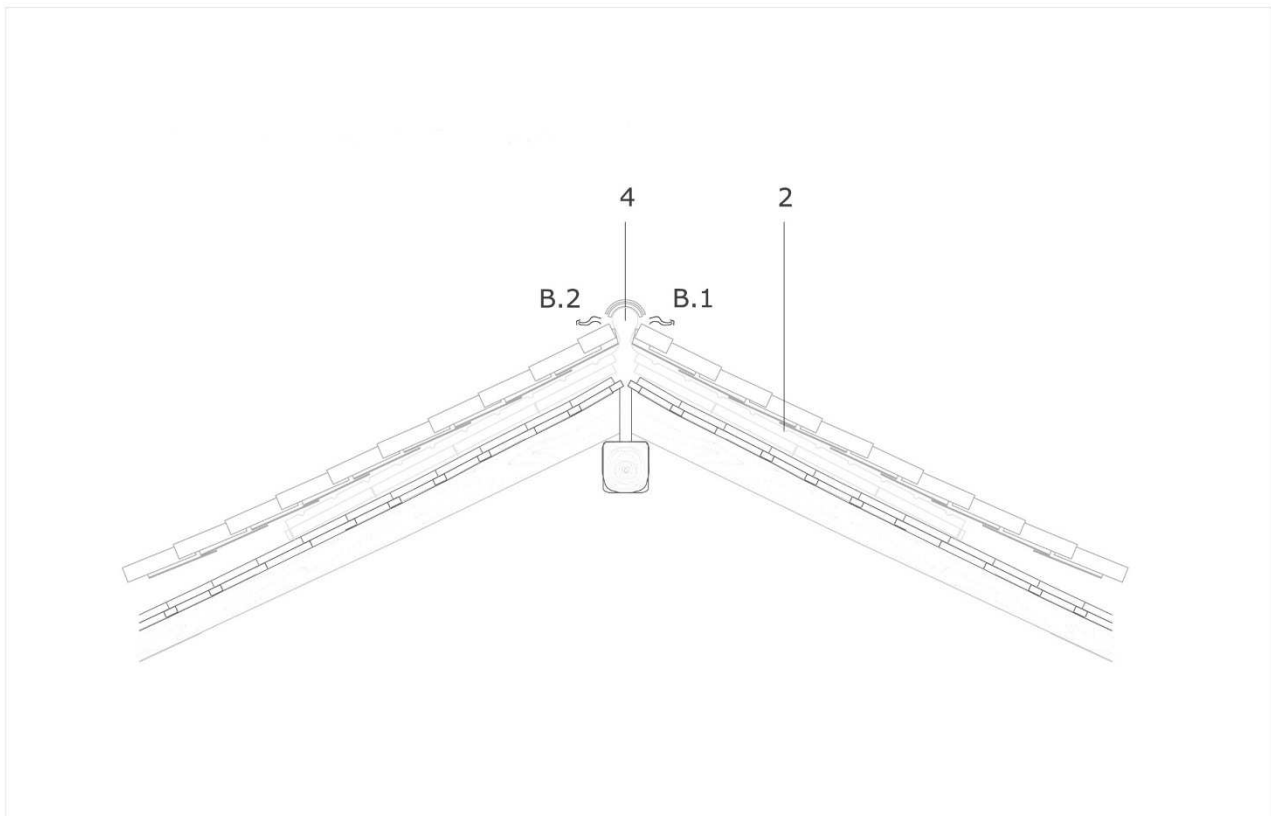
**INTELLECTUAL PROPERTY RIGHTS**

A Spanish patent has been applied for with the reference P201331682 and filing date 11/18/2013. In process of internationalization by PCT.

**COLLABORATION SOUGHT**

- License agreement for use, manufacturing or commercial exploitation.
- R&D for further development of the invention or for exploring its applications in other industrial sectors.

**RELATED IMAGES**



**CONTACT DETAILS**

Hugo Cerdà  
Oficina de Cooperación en Investigación y Desarrollo Tecnológico (OCIT)  
Universitat Jaume I de Castelló  
Tel: +34 964387487  
e-mail: hcerda@uji.es

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Web: <http://ujiapps.uji.es/serveis/ocit/>