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Dirección General de Investigación
e Innovación Tecnológica
CONSEJERÍA DE CIENCIA,
UNIVERSIDADES E INNOVACIÓN

CATALOGUE

Construction
and
Infrastructure

Scientific and
Technological
Offer

Construction and infrastructure

— Lime-cement mixture with improved thermal and acoustic characteristics

— Ventilated facade building system of folded sheet without frame

— Vibroacoustic spectrometry system for the non-destructive analysis of materials.



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LIME-CEMENT MIXTURE WITH IMPROVED THERMAL AND ACOUSTIC CHARACTERISTICS

Patent
ES-2548221

Code

CONSTR_UAH_03

Application areas

- Industrial Manufacture, Material and Transport technologies
- Other Industrial Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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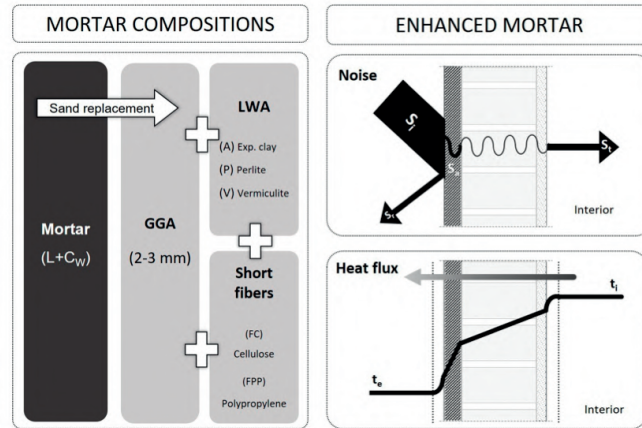
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ABSTRACT

The present invention is a modified mixture of lime and cement with improved thermal and acoustic characteristics. The new mixture can be used on interior and exterior walls, in new construction and rehabilitation or in built heritage restoration. The mixture is characterized by the following components: a hydraulic binder, an aerial binder, a gap-graded siliceous or calcareous aggregate, lightweight aggregates with a maximum size of 4 mm (expanded perlite, expanded shale, expanded clay or a mixture thereof), short fibres of cellulose or polypropylene and/or mineral pigments.

In the scope of the present invention, is preferable to use a mixture of White cement and aerial lime as binder that accelerates lime setting time. It allows adapting to aesthetic requirements, because of being pigmentable with the use of metal oxides.

The group seeks manufacturers of building materials and construction companies specialized in rehabilitation to reach licensing agreements, collaboration and commercial agreements with technical assistance.

ADVANTAGES AND INNOVATIONS

- The compositions of the mixture improve thermal and acoustic aspects compared with conventional mixed mortar.
- The mechanical strength provided by the compositions of the mixture is enough to be used as a finishing material on an external wall.
- No need to be protected with a better mechanical and durability performance finishing on the face where you have applied the mixture.
- The sound absorption coefficient of mortars improves.
- Improvement in the compound's thermal capacities.
- Applicable on interior and exterior walls, in new construction and rehabilitation or restoration of built heritage.



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VENTILATED FACADE BUILDING SYSTEM OF FOLDED SHEET WITHOUT FRAME

Patent

ES2664768

Code

CONSTR_UAH_05

Application areas

- Industrial Manufacture, Material and Transport technologies



Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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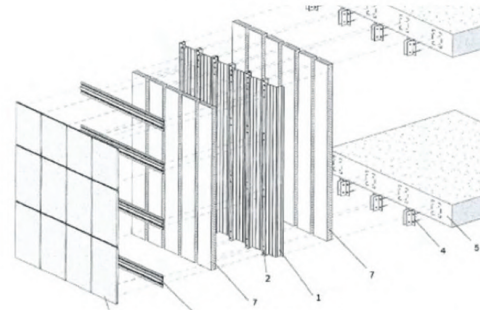
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ABSTRACT

New ventilated facade system characterized by the incorporation of a folded sheet placed in the middle of the section, which acts as a structural element of the façade and holds the rest of the materials and constituents of the facade. The sheet is folded forming ribs on both sides of the sheet, strengthening the façade and producing suitable modulations for both fixing the outer finishing material and transmitting the loads (own weight and horizontal actions) to the structure of the building by means of fastening elements located in the edge of the floor slab.

With this ventilated facade system the overall mechanical stiffness of the façade is improved as a result of the inclusion of the folded sheet, increasing the mechanical resistance of the assembly against horizontal actions, especially those produced by extreme climate events, such as strong winds, earthquakes or other, increasing the postevent resilience of the facade.

The group looks for companies in the building sector and manufacturers of facade systems to sign technical cooperation agreements, commercial agreements with technical assistance and patent licensing agreements.

ADVANTAGES AND INNOVATIONS

The invention does not require a structural frame, since the folded sheet forming ribs on both sides of the sheet endows the facade with mechanical stiffness giving the system the ability to transfer mechanical loads without the need of a specific structure.

Regarding the construction procedure of the facade, it facilitates the redesign of the facade regarding the structure of the building, since it allows the adjustment at the fixing points both in height and in the direction perpendicular to the facade by means of mechanical joints arranged in the side of the rib. The fixing system only requires adjusters in the horizontal direction contained in the facade plane, rather than the threedimensional adjusting systems required in conventional frame ventilated facades.

- Technical difficulty and reasonable implementation costs.
- The other facade elements can be fixed directly to the folded sheet.
- It allows to establish a modulation to the interior equal or different from the one of the exterior.
- Improves the overall performance of the facade and increases resilience during and after an extreme event linked to the effect of water or external horizontal forces, such as those produced by strong winds, hurricanes, earthquakes, etc.



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VIBROACOUSTIC SPECTROMETRY SYSTEM FOR THE NON-DESTRUCTIVE ANALYSIS OF MATERIALS

Patent

ES2597979 R1
&
ES2597979 B2

Code

CONSTR_UAH_06

Application areas

- Industrial Manufacture, Material and Transport technologies



- Other Industrial Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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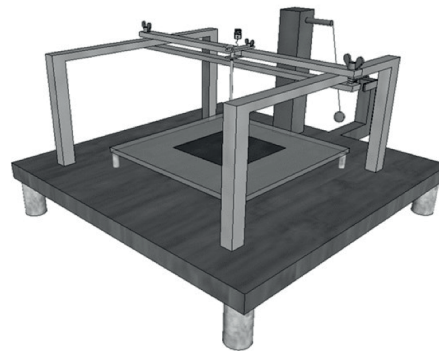
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ABSTRACT

It is a system of analysis of the properties and defects of materials without specific treatment. That is the case of being able to detect defects hidden in pieces in the own line of production in real time or characterization of chemical and mechanical properties of the materials, roughly or manufactured. In addition, the system is applicable almost any type of material (fluid, solid or composite).

The proposed system consists of an isolated platform that allows the production of vibroacoustic signals by indirect impact on a resonant sheet capable of exciting the materials under study.

The excitation energy of the material is transferred by the impact vibration of a vibrating sheet to audible sound frequencies. The coupling between the material and the vibrating sheet will cause changes in the emission spectral characteristics of the vibrating sheet under normal conditions, whose analysis allows to determine the response of the material and its mechanical, chemical and structural characteristics.

ADVANTAGES AND INNOVATIONS

- Currently, practically all systems of non-destructive analysis of materials based on acoustic techniques use ultrasound. However, the proposed invention works in the audible range which causes, as we will see in the section of competitive advantages, a reduction of the costs and the technical complexity of the analyzes, that can be carried out in situ.
- When working at the audible range, it is not necessary to use gels to adapt the acoustic impedances between the measuring instrument and the material.
- When no impedance matching gels are needed, the material to be studied is not damaged.
- Allows the analysis by indirect impact of materials, both solid and liquids.
- Does not require exhaustive maintenance except for an acceptable level of cleaning.
- Ideal for aggressive environments where other systems with more fragile components could easily suffer damage.