Paint system for surface treatment of wood for exterior use

Development status

Phase 2

Feasibility study. There is a realistic design of the technology and the initial tests in the laboratory are leading to the specification of the technology requirements and its capabilities.

IP protection status

National patent application filed: 310129 Filed PCT patent application: PCT/CZ2021/050155

Partnering strategy

Collaboration, licensing

Institution

Czech University of Life Sciences Prague

Challenge

Due to its mechanical parameters and full renewability, wood will be increasingly used in the construction industry, both for non-structural and structural applications. As a natural material, requirements are placed on its protection against the effects of the weather. The developed system solves the surface protection of wood in an innovative way with the aim of extending its life while preserving its natural pattern.

Description

The technical solution refers to the surface treatment of wood, suitable for increasing its resistance to exterior influences, with an extended overall life of this treatment preserving the original appearance of the underlying wood. The invention is particularly suitable for transparent, but also lightly pigmented and semi-transparent wood surface treatments, which are most sensitive to the external environment. Surface treatment can be applied to all types of wood. The solution uses knowledge from the field of nanotechnology and combines it with traditional wood surface treatments. Composition of the covering system: The first layer contains an acrylic water-dilutable coating based on polymers of acrylic acid esters. The second layer contains a polyamide nanofibrous nonwoven fabric with a thickness in the range of 1 to 5 nm and a weight in the range of 100 to 500 mg/m^2, while the diameter of the nanofibers of said nanofibrous nonwoven fabric is in the range of 1 to 4 nm and their length is in the range of 5 mm to 500 mm. The non-woven fabric is made of nylon from the polyamide 6 (PA6), polyamide 610 (PA610), polyamide 8 (PA8), polyamide 11 (PA11) or polyamide 12 (PA12) group. The third layer consists of an acrylic water-dilutable coating based on polymers of acrylic acid esters.

Commercial opportunity

Our technical solution is intended for a wide range of users, companies

in the wood industry, construction and architecture. The mentioned solution is especially suitable for the surface treatment of natural wood of all types of wood exposed to the exterior, which does not serve as a walking surface. These are mainly facade elements, windows, doors, cladding, non-walkable parts of bridge structures, railings, fences, balconies, pergolas, gazebos, etc. The surface treatment must be applied to already finished elements (facade boards, boards, panels, etc.) in the factory (as is currently done in the production of windows, facade elements with traditional surface treatment) and then only assembly is carried out after transportation at the point of use.