



(11) Publication number : **0 554 203 A1**

(12)

EUROPEAN PATENT APPLICATION

(21) Application number : **93610001.5**

(51) Int. Cl.⁵ : **F16H 7/00, // E04B2/96**

(22) Date of filing : **19.01.93**

(30) Priority : **31.01.92 DK 115/92**

(43) Date of publication of application :
04.08.93 Bulletin 93/31

(84) Designated Contracting States :
DE DK FR GB SE

(71) Applicant : **V. KANN RASMUSSEN INDUSTRI A/S**
10 Tobaksvejen
DK-2860 Soborg (DK)

(72) Inventor : **Sorensen, Henning Villiam**
10 Fagerlunden
DK-2950 Vedbaek (DK)
Inventor : **Burger, Palle René**
28 Kometvej
DK-4040 Jyllinger (DK)
Inventor : **Andersen, Leif Vikaer**
18 Pilemosevej
DK-2700 Bronshoj (DK)

(74) Representative : **Raffnsøe, Knud Rosenstand et al**
Internationalt Patent-Bureau, 23 Høje
Taastrup Boulevard
DK-2630 Taastrup (DK)

(54) **Modular system for building facades.**

(57) In a modular system for a building facade composed of substantially equally large rectangular modules with glazing panels and/or opaque plate panels secured in mutually connected horizontal and vertical frame members (2, 3), preferably made from metal profiles, the frame members (2, 3) are mounted on the modules (1) and have a substantially L-shaped cross-section with a comparatively narrow external flange (4) as a support for an edge portion of a glazing or plate panel (1) on its external side and an inwards projecting profile wall (6) substantially perpendicular to the glazing or plate panel (1). At one set (3) of horizontal frame members or vertical frame members, respectively, each profile wall (6) is at its innermost end connected with a heat-insulating mounting element (7), said mounting elements (7) for two juxtaposed profile walls (6) of frame members of neighbouring panels being secured to a common carrier profile (8) fastened on a part (12) of the building structure by means of fixture means to be mounted and dismantled from the inside of the building.

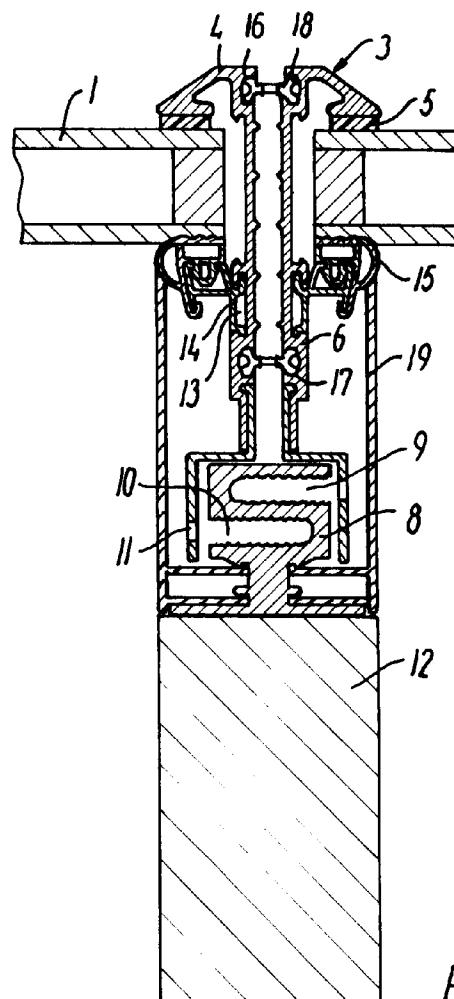


FIG. 2

The invention relates to a modular system for a building facade composed of substantially equally large rectangular modules comprising glazing panels and/or opaque plate panels secured in mutually connected horizontal and vertical frame members, preferably made from metal profile.

Such modular systems are known in many variants, inter alia from EP-AI-0 301 166, EP-AI-0 334 071, EP-AI-0 395 040, EP-AI-0 431 230 and EP-AI-0 451 537, DE patent No. 3 540 385, FR-AI-2 649 441 and US-BI-3 527 010. The prior art designs have in common that comparatively complicated frame structures, frequently with a considerable number of separate components are prescribed for the securing of the panels to the building construction.

Moreover, the anchoring to the building construction may generally - also due to the dimensions of the panels - frequently only be effected from the outside of the building by use of building cranes and scaffoldings. In particular, in case of replacement of panels this circumstance strongly increases the costs incurred by the dismantling work and mounting work.

GB patent No. 1 277 891 and US patent No. 3 527 010 deal with facade building systems in which the panels proper may be mounted from the inside of the building but also in this case the securing is made on vertical mullions extending throughout the height of the building and which must be secured from the outside of the building.

Moreover, it applies to the prior art structures that the frame members which are generally made from strongly heat-conducting metal profiles, in particular aluminium profiles, give rise to cold bridges in the interior of the building, so that said construction in spite of the use of highly insulated glazing panels with insulating panes and corresponding highly insulated sheet panels do not fully satisfy modern requirements for low-energy.

It is the object of the present invention to provide a modular system of the above mentioned type in which said drawbacks are remedied through a simpler and thus less expensive design of the frame structure that is far more easier to mount and which further completely solves the problem of cold bridges.

This is obtained according to the invention in that the modules are prefabricated with mounted frame members having a substantially L-shaped cross-section with a comparatively narrow external flange as a support for an edge portion of a glazing or plate panel on the external side thereof and an inwards projecting profile wall substantially perpendicular to the glazing or plate panel and which is connected with an elongated supporting member for engaging said edge portion at the internal side of the panel, said profile wall at one set of horizontal frame members or vertical frame members, respectively, at its innermost end being connected with a heat-insulating mounting element, said mounting elements for two juxtaposed

profile walls of frame members of neighbouring panels being secured to a common carrier profile secured on a part of the building structure by means of fixture means to be mounted and dismantled from the inside of the building.

Due to the mounting by means of heat-insulating mounting elements the heat transmission through the frame profiles to the interior of the building is considerably reduced and the design of the main profile connected with the building structure as described entails that the mounting and dismantling of modules both upon erection of the building and in case of later changing may take place from the interior of the building, thereby avoiding the use of crane and erection of scaffolding.

Further details and advantages of the invention appear from the dependent claims.

The invention will now be explained in detail with reference to the drawings, in which

Fig. 1 is an example of a section of a building facade composed by use of a modular system according to the invention,

Fig. 2 is a horizontal sectional view of vertical frame members for two neighbouring panels in connection with a load-bearing pillar of a building construction in an embodiment of the modular system,

Fig. 3 is a vertical sectional view of the horizontal frame members between two superjacent neighbouring panels in the same embodiment.

Fig. 1 illustrates an example of a section of a building facade of substantially equally large rectangular modules 1 which may comprise glazing panels with double or multilayer thermopanes as well as opaque plate panels of any sheet material appropriate for use in building facades.

The modules 1 are secured in mutually connected horizontal frame members 2 and vertical frame members 3, preferably consisting of metal profiles, in particular aluminium profiles.

As it appears from Fig. 1, the design of the frame structure illustrated in Figs 2 and 3 which will be explained in more detail in the following entails that the vertical and horizontal lines in the facade rebuilding appear as discrete, narrow lines, the frame profiles having substantially the same width on the external and internal side of the panels.

As it appears from Figs 2 and 3 the horizontal frame members 2 and vertical frame members 3 of each panel have a substantially L-shaped cross-section with a comparatively narrow external flange 4 which through an intermediate sealing 5 constitutes the support of an edge portion of the associated glazing or plate panel 1 on the external side thereof, and an inwards projecting profile wall 6 substantially perpendicular to the glazing or plate panel 1.

In the illustrated embodiment the profile wall 6 at the vertical frame members 3 is at its innermost end

connected with a heat-insulating mounting element 7 which together with the corresponding mounting element for the juxtaposed vertical frame member of an adjacent panel is secured to a carrier profile 8 by fixture means which according to the invention may be mounted and dismantled from the inside of the building.

In the illustrated embodiment the main profile 8 is provided with screw channels 9 and 10 opening into opposite surfaces that are substantially perpendicular to the panels 1 for receiving screws, not shown, passed through bolt holes in the mounting elements 7 formed as rails with a substantially Z-shaped cross-section.

In the illustrated embodiment the main profile 8 is secured to a load-bearing pillar 12 in the building structure corresponding to the circumstance that the substantially rectangular panels 1 are designed with a width corresponding to the distance between such load-bearing pillars.

As it appears, the profile wall 6 in either of the frame members 2 and 3 is provided with a groove 13 for receiving a glazing bead which in the illustrated embodiment retains a separate gasket 15 separately resting on the internal side of the panel. However, there is no hindrance that the glazing bead 14 and the gasket 15 may be designed as an integral element.

Moreover, in the sides facing each other of the profile walls 6 of adjacent frame members 2 and 3 of juxtaposed panels there are provided two sets of recesses 16 and 17 each of which accommodates a sealing 18 which together with the opposite corresponding sealing on the frame member of the neighbouring profile completely covers the joint between the neighbouring panels, thereby sealing said joint on the external and internal side of the panels without the use of other measures.

In the illustrated embodiment the parts of the profile walls 6 accommodated within the panels 1 and the mounting elements 7 connected therewith and the carrier profile on either side of the frame member are covered by a cover profile 19 preferably designed so that it tightly joins the load-bearing pillar 12 with which the frame members 3 are connected, and further tightly joins the gasket fillet 15 at the glazing bead 14 so that the frame structure from the inside of the building appears with smooth external sides easy to clean.

As regards the horizontal frame members 2 shown in Fig. 3 the L-shaped frame profile proper is identical with the frame profile of the vertical frame members, i.e. with the external flange 4 and the profile wall 6. The innermost ends of the profile walls 6 of the frame members of two adjacent panels 1 are here, however by means of an auxiliary profile 20 connected with a heat-insulating cover profile 21 which in the same manner as the cover profile 19 for the vertical frame members covers the parts of the

profile walls 6 accommodated within the panels 1 so that they tightly join the sealings 15 at the glazing beads 14. Also the cover profile 21 has a smooth external side easy to clean.

In the illustrated embodiment in which solely the vertical frame members are secured to the load-bearing pillars 12 of the building structure the height of the panels may be chosen optionally, however preferably so that the modular height constitutes a whole fraction, e.g. half or a third of the height between the storey partitions, the panel dimensions being further chosen so that the panels with a view to the advantageous possibility of the invention of dismantling and mounting from the inside of the building may pass through doors and similar openings in the room partitions of the building.

As an alternative of the illustrated embodiment the frame structure may be carried out in such a manner that the horizontal frame members are connected with parts of the building structure, in casu the storey partitions whereby, however, the panel height must correspond to the height between the storey partitions and as a consequence the panels might become more bulky, in particular in case of replacement.

Claims

1. A modular system for a building facade composed of substantially equally large rectangular modules (1) comprising glazing panels and/or opaque plate panels secured in mutually connected horizontal and vertical frame members (2, 3), preferably made from metal profile, characterized in that the modules are prefabricated with mounted frame members (2, 3) having a substantially L-shaped cross-section with a comparatively narrow external flange (4) as a support for an edge portion of a glazing or plate panel on the external side thereof and an inwards projecting profile wall (6) substantially perpendicular to the glazing or plate panel and which is connected with an elongated supporting member (14) for engaging said edge portion at the internal side of the panel, said profile wall (6) at one set (3) of horizontal frame members or vertical frame members, respectively, at its innermost end being connected with a heat-insulating mounting element (7), said mounting elements (7) for two juxtaposed profile walls (6) of frame members of neighbouring panels being secured to a common carrier profile (8) secured on a part (12) of the building structure by means of fixture means to be mounted and dismantled from the inside of the building.
2. A modular system according to claim 1, characterized in that said elongated supporting member is constituted by a glazing bead (14) accommo-

dated in a groove (13) formed in the profile wall (6).

3. A modular system according to claim 1 or 2, characterized in that said main profile (8) is provided with screw channels (9, 10) opening into opposite surfaces that are substantially perpendicular to the panels (1) for receiving screws passed through bolt holes in the mounting elements (7). 5 10
4. A modular system according to claim 1, 2 or 3, characterized in that the profile walls (6) associated with juxtaposed frame members (2) of neighbouring panels at the other set of vertical or horizontal frame members on their parts projecting inside of the panels are designed to be connected with a heat-insulating cover profile (21). 15
5. A modular system according to any of the preceding claims, characterized in that the parts of the profile walls (6) disposed inside of the panels (1) and the mounting elements (7) connected therewith and said carrier profile (8) are covered by a cover profile (19). 20 25
6. A modular system according to claims 4 and 5, characterized in that said cover profiles (19, 21) for both sets of frame members have smooth external sides easy to clean. 30
7. A modular system according to any of the preceding claims, characterized in that the profile walls (6) of juxtaposed frame members of neighbouring panels on their sides facing each other have recesses (16, 17) for receiving sealing gaskets (18) which when installed together seal the joint between said frame members (2, 3). 35 40 45 50 55

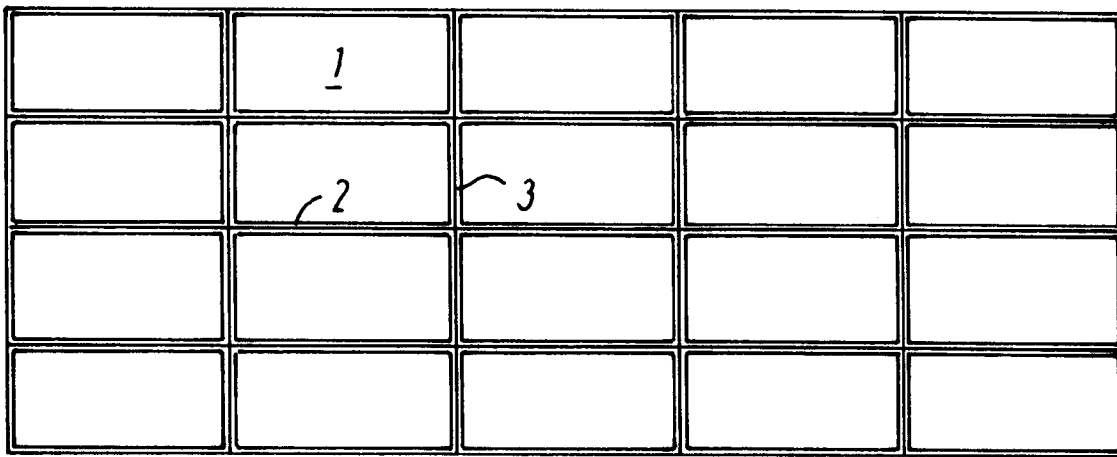


FIG. 1

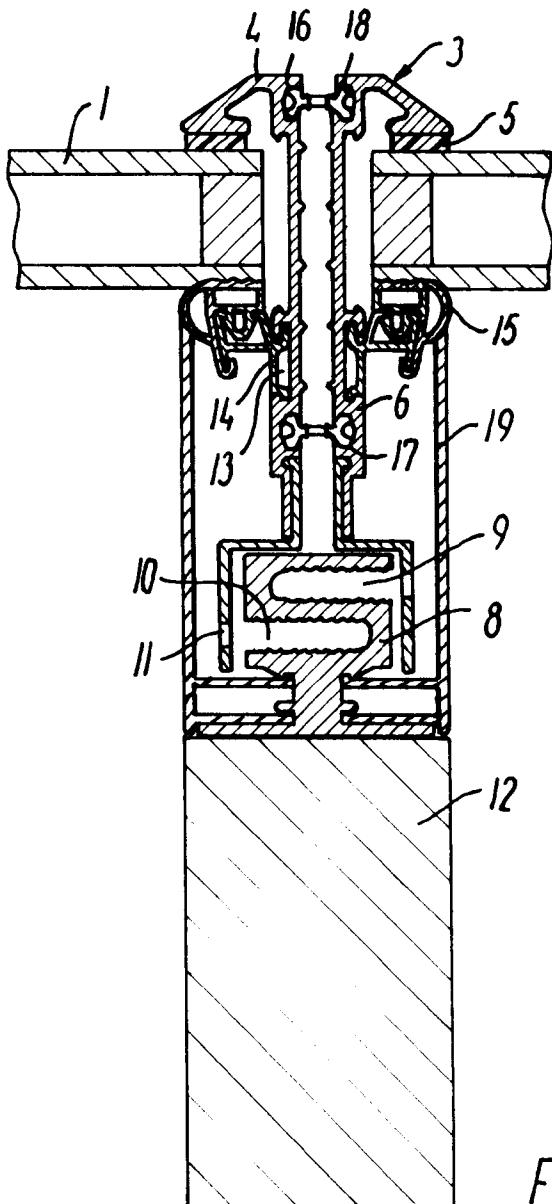


FIG. 2

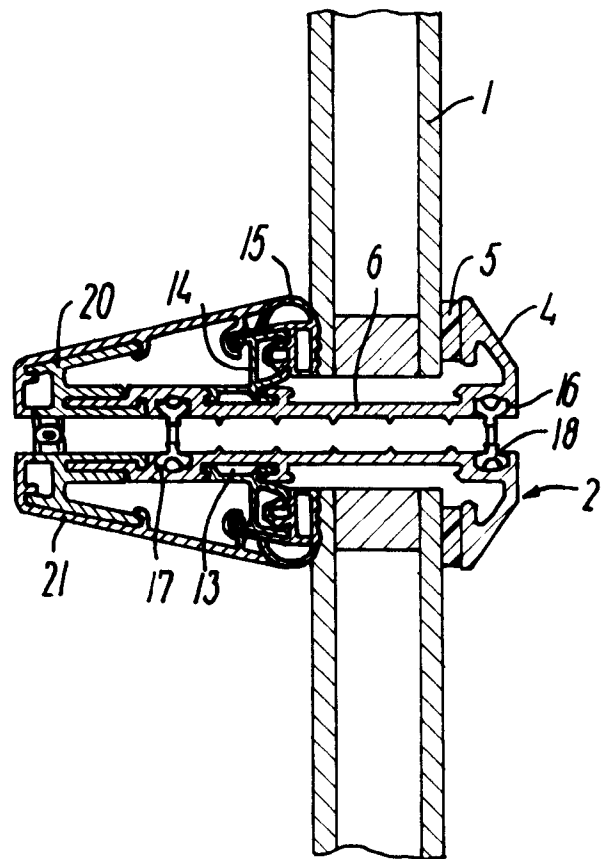


FIG. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93610001.5

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-C2-3 540 385 (ELTREVA AG) *Column 4, line 24 - line 40; figure 1*	1-7	E06B 3/54 // E04B 2/96
A	-- EP-A1-0 334 071 (GLAS BAUMANN GESELLSCHAFT M.B.H. & CO. KG) *Column 2, line 38 - line 57; figure 3*	1-7	
A	-- GB-A- 2 194 278 (EDUARD HUECK) *Page 3, line 14 - line 27; figure 3, 4, 5*	1-7	
	-- -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E06B E04B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
STOCKHOLM		07-04-1993	JUVONEN V.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.92 (P0401)