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(54) **SET OF FRAME AND WING SECTIONS AND ELEMENTS IN FIREPROOF CONSTRUCTIONS**

SATZ VON RAHMEN- UND FLÜGELABSCHNITTEN UND ELEMENTEN IN BRANDSICHEREREN
BAUTEN

ENSEMBLE DE SECTIONS ET D'ELEMENTS D'AILE ET D'OSSATURE DANS DES
CONSTRUCTIONS RESISTANTES AU FEU

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(73) Proprietor: **Aluprof Spolka Akcyjna
43-300 Bielsko-Biala (PL)**

(72) Inventor: **CHWASTEK, Jenusz
PI-43-300 Bielsko-Biala (PL)**

(74) Representative: **Rygiel, Andrzej
Kancelaria Rzecznika Patentowego Andrzej
RYGIEL,
ul. Bohaterow Warszawy 26, Lok. F
43-300 Bielsko-Biala (PL)**

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Description

[0001] The object of the invention is a set of frame and wing sections and elements in fireproof construction designed for face and partition walls of a building.

[0002] According to the Polish Patent Description No -178256, there is a frame known, made of metal sections used for production of fireproof front windows and doors or glazed roofs characterised by having protective panels or other profiles made of heat-absorbing hydrophilic material of a high water content, or panels or other profiles comprising some heat-absorbing hydrophilic material of a high water content, installed on the internal and/or external surfaces of aluminium sections.

[0003] According to the European Patent No. 0717165 A1, a frame is known made of the metal profiles in fireproof version for windows and doors, facades or glazed roofs characterised by that from the outer and/or inner side of the metal profiles made of aluminium, plates masking that profiles are attached or other profile elements made of heat-absorbing hydrophilic material of a high water content, or panels or other profiles comprising some heat-absorbing hydrophilic material of a high water content, while, hydrophilic absorbent, according to the claim, contains potash alum.

[0004] Such a solution ensures a fire-proof insulation of windows, doors, glazed facades or roofs thanks to using a hydrophilic absorbent, which creates internal or external protective zone but the fire-proof elements have asymmetrical shape and there are no technical means causing sealing of the particular components among themselves.

[0005] According to the European Patent No. 0927809 A2, there is a fire-resistant building element known, for a facade or the like that includes at least one window pane and an aluminium frame therefore. Glass clips for mounting the window pane to the frame are made of stainless steel and are attached to aluminium profiles of the frame at opposite sides of the window pane. The profiles are connected by isolators or thermal breaks, and hollow space hereby defined contains a fire isolating fillet. The glass clips have a minimal width and are provided with slots for minimizing the heat conduction. The fire isolating fillet has a core of hard board and at each side thereof gypsum strips.

[0006] Because of the applied isolating fillet equipped with a hard board, this solution serves exclusively as a thermal barrier at the place of its attachment but due to the lack of the exact adhesion to the inner profiles walls, it does not cause the optimum heat energy reception. Applied hard board decreases the thickness of the cooling material, which deteriorates a thermal and fire-proof insulating power.

[0007] Set of frame and wing sections and elements in fireproof construction according to the invention consists of two kinds of shell-like aluminium sections set alternately: one section of a given shape in a frame and a wing. The aluminium sections of different shapes are

bound together with thermal separators, a profile cover plate and angle sections. On the other side they can be bound with a heat-expanding element set on the thermal separator and aluminium sections. Elements that cool the sections are set in spaces between them. Heat-expanding elements that press the cooling elements against section walls are set in the cavities between internal projections of thermal separators.

[0008] According to one embodiment wing consists of sections of varied shapes bound together with thermal separators where a heat-expanding element is set on the external surface and on the internal side sections are connected with the binding wall by a rivet and a screw. A fireproof pane, fixed with pane-holding laths with gaskets, is set in the space between sections and ceramic plates. A heat-expanding element is placed between the fireproof pane and the wall that binds sections from inside while gaskets are set in C-shaped cavities at the section ends and cooling elements are set in the sections. The sections, the profile cover plate, the angle section binding wall and thermal separators are permanently joined while other elements are freely set in the space they occupy. The profile cover plate, the binding wall and angle sections are made of infusible material.

[0009] The advantage of the aforementioned solution consists in providing the required insulation of a given room from the other part of a building in case of fire and a possibility of using sections, insulation profiles, ceramic plates and thermal separators of repeatable shapes both for frame and wing construction.

[0010] The elements included in the set of sections and elements of the frame and wing placed on the internal and external side of the shell-like sections enable generating many thermal zones during a fire, which increase fire resistance and influence the thermal insulation of the entire set. A successive pressure of the cooling elements placed inside the shell-like profiles to their inner walls enables their optimal cooling, and the use of the infusible materials for the profile cover plate, binding wall and angle sections additionally joins the elements of construction that impedes its heating.

[0011] The object of the invention is presented as the example product in the drawing, where Fig. 1 shows a set of frame and wing sections and elements in fireproof construction presented in cross section of the frame and wing.

[0012] A set of frame sections in fireproof construction according to the invention consists of sections 1 and 2 of varied shapes bound together with thermal separators 3 and with externally binding profile cover plate 4 through a rivet 5. A heat-expanding element 6 is set on the other side, on the thermal separator 3 and on frame sections 1 and 2; section cooling elements 8 are set between thermal separators 3 and in frame sections 1 and 2 while heat-expanding elements 9 that press the cooling elements 8 against walls of sections 1 and 2 are set in cavities 7 between internal projections of thermal separators 3. The wing consists of sections 1' and 2' of varied shapes

bound together with thermal separators 3' with a heat-expanding element 6' set on the external surface. From the internal side, sections 1' and 2' are connected with a binding wall 10' by a rivet 5' and a screw 11'. A fireproof pane 14', fixed with pane-holding laths 15' with gaskets 16', is set in the space between angle sections 12' and ceramic plates 13'. A heat-expanding element 17', which closes the space between the fireproof pane 14' and the binding wall 10', is placed between the fireproof pane 14' and the wall 10' that binds sections 1' and 2' from inside. Gaskets 19' are set opposite each other in C-shaped cavities 18' at the ends of sections 1' and 1'. Cooling elements 20' and 20' are set in the sections 1', 1', 2' and 2'. The sections 1', 1', 2' and 2', the profile cover plate 4', the binding wall 10', angle sections 12', as well as thermal separators 3' and 3' are permanently joined together while other elements are freely set in the space they occupy. The profile cover plate 4', the binding wall 10' and angle sections 12' are made of infusible material.

[0013] In case of fire the method of operation of the set of fireproof wall sections and elements consists in the fact that under the influence of heat affecting the set surface, the elements 6', 6', 9' and 17' expand their volume filling up the space they occupy and sealing it. The cooling elements 8' and 8' and 2' and 2' cool down the walls of sections 1', 1', 2' and 2'.

Claims

1. A set of frame and wing sections and elements in fire-proof construction with protective panels or other heat-absorbing profiles installed on internal and/or external surfaces of shell-like aluminium sections (1,2,1',2') permanently joined together by thermic separators (3), cooling elements (20, 20') being set loosely in the spaces of the frame and wing, **characterised in that** each frame and wing section consists of two kind of aluminium sections (1,2 and 1'2') set alternatively diagonally to form the frame section and the wing section with one aluminium section (1,2;1',2') of the same kind, the aluminium sections (1,1',2,2') being joined together by a cover plate (4), a binding wall (10) and angle sections (12) which all are made of infusible material, and **in that** heat-expanding elements (9) are set in the central space of the frame and the wing.
2. A set of frame and wing sections and elements in fire-proof construction, according to Claim 1, **characterised by** the fact that the aluminium sections (1, 2; 1', 2') are bound from the first outer side with a thermal separator (3) and a profile cover plate (4) by rivets (5), while from the other inner side on the thermal separator (3) bounding the aluminium sections (1, 2; 1', 2'), a heat-expanding element (6) is set, while in thermal cavities (7) between internal projections of the thermal separators (3) heat-expand-

ing elements (9) pressing cooling elements (8) to the inner walls of the aluminium sections (1, 2, 1', 2') are set.

3. A set of frame and wing sections and elements in fire-proof construction, according to Claim 1, **characterised by** the fact that the wing consists of aluminium sections (1', 2') of varied shapes, bound with thermal separators (3'), where a heat-expanding element (6') is set on their outer surface, and from the inner side, the aluminium sections (1', 2') are connected with a binding wall (10) by a rivet (5) and a screw (11), and in the space between the angle sections (12) and ceramic plates (13) a fireproof pane (14) is set, fixed by pane-holding laths (15) with gaskets (16), while, between the fireproof pane (14) and the wall (10) binding the sections (1', 2') from the inner side, a heat-expanding element (17) is placed, and in cavities (18) in the shape of letter C at the ends of the sections (1, 1') gaskets (19) are set.

Patentansprüche

1. Der Satz von Rahmen- und Flügelabschnitten und Elementen in brandsichereren Bauten mit befestigten Schutzpaneelen oder anderen Wärme absorbierenden Profilen an den äußeren und/oder inneren Oberflächen der schalenförmigen Aluminiumabschnitte (1, 2, 1', 2'), die mit Hilfe von thermischen Abstandshaltern (3), kühlenden Elementen (20, 20'), die in dem Rahmen- und Flügelraum lose eingesetzt sind, fest verbunden sind, **gekennzeichnet dadurch, dass** jeder Rahmen- und Flügelabschnitt aus zwei Arten von Aluminiumabschnitten (1, 2 und 1', 2') besteht, die wechselweise diagonal eingesetzt sind, damit sie mit einem Aluminiumabschnitt (1, 2; 1', 2') der gleichen Art den Rahmenabschnitt und den Flügelabschnitt bilden, wobei die Aluminiumabschnitte (1, 1', 2, 2') mit einer Abdeckplatte (4), einer zusammenbindenden Wand (10) und Winkeln (12) verbunden sind, die alle aus einem schwer schmelzbaren Material ausgeführt sind, sowie **dadurch**, dass die unter Wärmeauswirkung ausdehnenden Elemente (9) in dem Mittelraum des Rahmens und des Flügels eingesetzt sind.
2. Der Satz von Rahmen- und Flügelabschnitten und Elementen in brandsichereren Bauten nach dem Anspruch 1, **gekennzeichnet dadurch, dass** die Aluminiumabschnitte (1, 2; 1', 2') von der Außenseite mit einem thermischen Abstandshalter (3) und einer profilierten Abdeckplatte (4) durch Niete (5) verbunden sind, und von der Innenseite dagegen an dem thermischen Abstandshalter (3), der die Aluminiumabschnitte (1, 2; 1', 2') verbindet, ein unter Wärmeauswirkung ausdehnendes Element (6) eingesetzt ist sowie in den thermischen Hohlräumen (7) zwi-

schen den inneren Vorsprüngen der thermischen Abstandshalter (3) die unter Wärmeauswirkung ausdehnenden Elemente (9) eingesetzt sind, die die kühlenden Elemente (8) an die Innenwände der Aluminiumabschnitte (1, 2; 1', 2') drücken.

3. Der Satz von Rahmen- und Flügelabschnitten und Elementen in brandsichereren Bauten nach dem Anspruch 1, **gekennzeichnet dadurch, dass** der Flügel aus den Aluminiumabschnitten (1', 2') in unterschiedlicher Form besteht, die mit den thermischen Abstandshaltern (3') verbunden sind, wo an ihrer äußeren Oberfläche ein unter Wärmeauswirkung ausdehnendes Element (6') eingesetzt wird und von der Innenseite die Aluminiumabschnitte (1', 2') mit einer zusammenbindenden Wand (10) durch einen Niet (5) und eine Schraube (11) verbunden sind, und in dem Raum zwischen den Winkeln (12) und den keramischen Platten (13) eine feuerfeste Scheibe (14) eingesetzt ist, die mit den an der Scheibe anliegenden Leisten (15) mit Dichtungen (16) fixiert wird, und zwischen der feuerfesten Scheibe (14) und der Wand (10), die die Abschnitte (1', 2') verbinden, von der Innenseite ein unter Wärmeauswirkung ausdehnendes Element (17) angebracht ist und in den Hohlräumen (18) in der C-Form an den Enden der Abschnitte (1, 1') Dichtungen (19) eingesetzt sind.

Revendications

1. Ensemble de sections et d'éléments d'aile et d'ossature dans des constructions résistantes au feu, sur des faces extérieures et/ou intérieures des sections-coquilles (1, 2, 1', 2') en aluminium (1, 2, 1', 2') de panneaux de protection ou d'autres sections absorbant la chaleur, liés d'une manière stable à l'aide des intercalaires thermiques (3), des éléments de refroidissement (20, 20'), logés d'une manière non ajustée dans l'ossature et dans l'aile, **caractérisée en ce que** chaque section de l'ossature et de l'aile est composée de deux types de sections en aluminium (1, 2 et 1', 2') logées l'une après l'autre transversalement pour former ainsi une section de l'ossature et une section de l'aile dans une seule section en aluminium (1, 2; 1', 2') du même type, étant précisé que les sections en aluminium (1, 1', 2, 2') sont liées à l'aide d'une barre (4), d'une cloison d'attelage (10) et à l'aide des cornières (12) qui sont toutes en matière infusible et **caractérisé en ce que** tous les éléments thermoextensibles (9) sont logés dans l'espace central de l'ossature et de l'aile.
2. Ensemble de sections et d'éléments d'aile et d'ossature dans des constructions résistantes au feu selon la revendication 1, **caractérisé en ce que** les sections en aluminium (1, 2; 1', 2') sont attelées d'un côté extérieur à l'aide d'un intercalaire thermique (3),

d'une barre profilée (4) et des rivets (5), par contre d'autre côté extérieur sur l'intercalaire thermique (3) qui relie les sections en aluminium (1, 2; 1', 2') est logé un élément thermoextensible (6), et dans les logements thermiques (7) situés entre les saillies des intercalaires thermiques (3) sont logés des éléments thermoextensibles (9) qui serrent les éléments de refroidissement (8) contre les faces intérieures des sections en aluminium (1, 2; 1', 2').

3. Ensemble de sections et d'éléments d'aile et d'ossature dans des constructions résistantes au feu selon la revendication 1, **caractérisé en ce qu'**un aile est composé de sections en aluminium (1', 2') ayant des formes différentes et reliées entre elles par des intercalaires thermiques (3') où, sur sa face extérieure, un élément thermoextensible (6') est logé et du côté intérieur sont logés des sections en aluminium (1', 2') fixées à la cloison d'attelage (10) à l'aide d'un rivet (5) et d'une vis (11), par contre dans l'espace entre les cornières (12) et les plaques céramiques (13) un vitre résistant au feu est logé (14) et immobilisé par des parcloles (15) avec joints (16), par contre entre le vitre résistant au feu (14) et la cloison (10) qui relie les sections (1', 2') de l'intérieur on a monté un élément thermoextensible (17) et dans les logements (18) en C aux extrémités des sections (1, 1') il y a des joints (19).

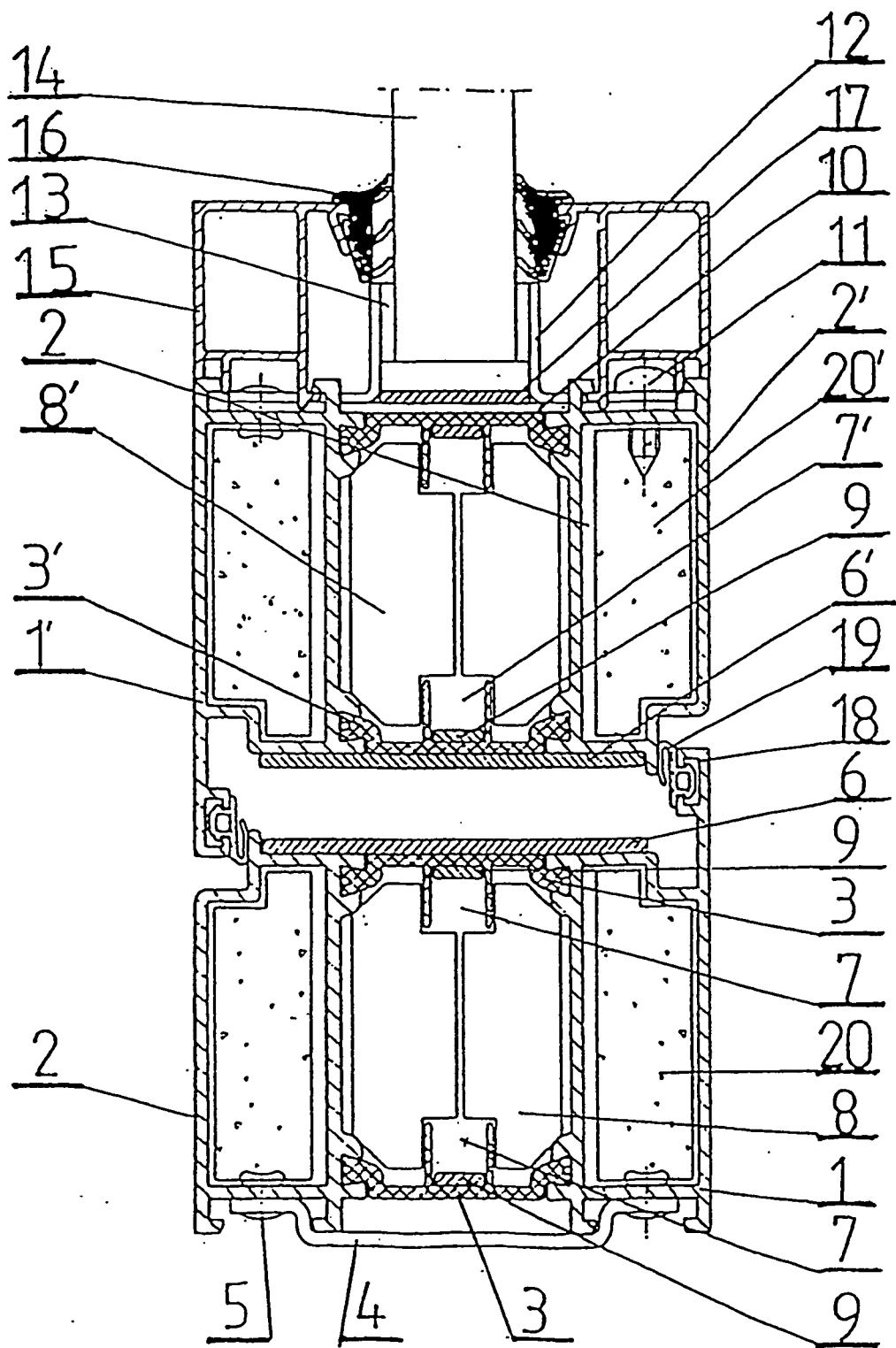


Fig.1

REFERENCES CITED IN THE DESCRIPTION

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