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Inventor : **Svane, Leo Kolling Adolphsen**
20 Genforeningspladsen
DK-2400 Copenhagen NV (DK)

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

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

A frame structure mainly for inward opening windows or glass doors.

A frame structure for inward opening windows or glazed doors comprises an internal wood frame (10) adapted to an internal wood main frame (22) and an external frame covering (17) of corrosion resistant rail profiles, which cover the wood profiles (10, 22) of the frame and main frame for protection of these from the action of the weather. A narrow internal edge portion of the thermo pane (1) is connected with a projecting flange part (4) of a flat edge fillet profile (2), which is connected with a glazing bead (3) on the outside and is designed on the inside to cover the outside of the wood frame (10). The frame covering comprises an outer wall (18) connecting with an inwardly oblique partition wall (23), which partly serves as drain in a water collecting chamber delimited by the frame covering and the edge fillet profile (2), and serves also as a ventilation duct along the circumference between the frame and the main frame, and partly together with a wall part (20) placed inside the outer wall covers the part of the wood main frame (22) which projects beyond the wood frame (10), but is mainly spaced from same.

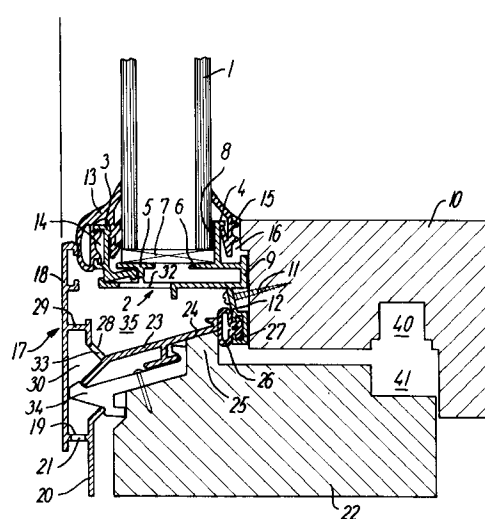


FIG. 1

The invention relates to a frame structure mainly for inward opening windows or glazed doors, of the type which comprises an internal wood frame adapted to an internal wood main frame and an external frame covering of corrosion resistant rail profiles, mainly of aluminium, which rails extend from a weather strip engaging an edge portion of the outer side of a thermo pane and cover the wood profiles of the frame and main frame to protect these against the action of the weather.

Window frames composed of internal wood profiles and external metal profiles are disclosed in, e.g. DK patent No.104642 and DE patent No.2135814 and have become increasingly common over the past years, since they meet users' preferences in respect of minimum demands on maintenance, being highly weatherproof and an aesthetically pleasant appearance, since only the external covering rail profiles can be seen from outside, and only the wood profiles used for the frame and main frame parts from inside.

The object of the invention is to provide a frame structure of said type which, in addition to meeting such users' preferences, also by improved airing and safe draining of water from the cavity between the wood and metal profiles provides an optimum protection of the wood profiles, the heat insulating effect of the frame being at the same time improved through a reduced risk of thermal bridges occurring, the overall frame structure entails a better materials exploitation and an improved ratio of the glazed area to the area corresponding to the external main frame dimensions. Another object of the invention is to simplify the manufacture and the mounting procedures for such frame structures.

These and other technical advantages are obtained according to the invention by a design of a frame structure which is characterized in that a comparatively narrow edge portion of the thermo pane on the inside of this is firmly connected to a projecting flange portion on a rail profile designed as a relatively flat edge fillet, which on the outside is connected to a glazing strip profile for retention of said weather strip and is designed on the inside to cover the outside of the wood frame, the external covering rail profiles having an outer wall connected with an inward projecting oblique partition wall, which in the lower horizontal frame portion partly provides a draining surface in a water collecting chamber delimited by the frame covering and said edge fillet profile and serving at the same time as a ventilation duct along the circumference between the frame and the main frame, and partly together with a wall portion inside the outer wall covers the part of the wood main frame which projects beyond the wood frame, but is mainly spaced from same.

By using a comparatively flat rail profile as a separate thin edge fillet around the thermo pane, establishing a rabbet for the pane in the wood profile can be

avoided, whereby a better materials exploitation is obtained, while at the same time the comparatively flat profile only moderately reduces the light-admitting area.

As the flat rail profile can be mounted on the thermo pane at the manufacturing stage, it also provides a good protection of the pane edges during transportation and handling.

By using the relatively flat rail profile, of which only a comparatively narrow end wall at one end abuts on the wood frame, the rigidity of the thermo pane proper is exploited in the frame structure, and the design also implies that the thermo pane can be placed more outwardly in the frame structure so that the outer glass layer comes close to the outer frame covering.

Together with the improved materials exploitation this entails an optimum reduction of the total width of the wood parts of the main frame and the main frame. In an embodiment which is particularly advantageous in this respect, the total width of the wood frame and the wood main frame measured at main frame level does not exceed 78 mm.

By the design of the rail profiles of the frame covering with said inwardly oblique partition wall, which in the finished frame structure will be removed downwards from the edge fillet around the thermo pane, a ventilation duct is formed in the finished frame structure throughout the circumference between the frame and the main frame, said duct also serving as a climate space in which the temperature in cold weather is somewhat above the ambient temperature. Moreover, the design of the edge fillet as a flat rail profile and of the rail profiles of the frame covering provides complete protection of all outward facing sides of the wood profiles and, at the same time, ventilation of same.

In an embodiment of the invention a simple way of fastening the thermo pane to said flat rail profile consists in fastening the edge portions of the thermo pane to the projecting flange part of the edge fillet profile by means of double-faced adhesive tape.

An optimum safety in respect of drainage of water from the cavity in the lower horizontal frame portion is obtained in a simple way by providing outlets for drainage of water from the collecting chamber in the transverse wall sections between the outer wall of the frame covering and said partition wall or wall part, respectively, of the lower horizontal frame portion.

A preferred embodiment according to the invention is also characterized in that the rail profiles of the frame covering are mitred in a rectangular frame shape by means of angle joints, the legs of which each comprises a part in close abutment on the inside of the outer wall of the rail profile in a groove arranged therefor and an inward projecting oblique part in close abutment on the underside of a partition wall between same and the upside of the wood main frame profile, whereby a mainly cross-sectionally V-shaped groove

between said parts in the lower horizontal frame portion serves to drain off water from the angle joint.

Hereby the conventional method of manufacturing metal profile frames by welding is avoided, and the mounting work is alleviated, while at the same time said angle joints ensure that the frame portions which are at right angles to each other are flush and the joint negligible. The angle joints further ensure that percolating water is drained off to be discharged in the lower horizontal frame profile.

The invention can be used for inward opening windows of various designs, including side-hinged windows and so-called pivot-hung or tiltable windows which can be opened either by tilting around a horizontal axis at the lower edge of the window or by pivoting around a vertical axis at one side of the window. The invention can also be used for sliding windows and balcony or terrace doors which open inward and where a larger light-admitting area is wanted than is normal for such doors.

The invention is further explained in the following with reference to the schematical drawing of a preferred embodiment, in which

fig 1 is a vertical sectional view of the lower horizontal frame and main frame portion,

fig 2 is a corresponding sectional view of the upper horizontal frame and main frame portion, and

figs 3-4 is a sectional view and a plan view of an angle joint.

In the embodiment shown, a double-glazed thermo pane 1 is retained in a thin edge fillet formed by a relatively flat aluminium profile 2, the window pane 1 being firmly connected to a projecting inner flange portion 4. The edge of the thermo pane is spaced from raised bottom wall portions 5 and 6 of the rail 2 by means of interspaced blocks 7, which may be of wood or plastic.

The fastening of the thermo pane 1 is accomplished by glueing a narrow edge zone on the inside of the thermo pane 1 to the outside of the projecting inner flange part 4 by means of double-faced adhesive tape.

On the inside of the thermo pane 1, a comparatively narrow end wall 9 of the rail profile 2 abuts on the outside of the wood frame profile 10, to which the rail profile 2 is fastened by means of a screw 11 passing through a flange part 12 which projects downwards from the profile.

Between the edges of the outsides of the thermo pane 1 and a glazing bead 3 retained in an out-turned groove of the rail profile 2, a weather strip 13 is arranged made of, e.g. flexible plastic material, the strip being retained in a rail 14 on the outside of the glazing bead 3.

The glazing bead 3 may be manufactured together with the rail profile 2 according to the method disclosed in DK patent application No.4727/89, so

that it is not broken off the rail profile 2 until the entire profile has been mitred.

Another weather strip 15 is arranged in the groove 16 provided between the outside of the wood frame profile 10 and the inner projecting flange part 4.

The frame covering 17 consists of a separate aluminium profile and comprises an outer wall 18 in the outermost vertical main frame plane which, via a transverse wall 19, at its bottom is connected to an inner wall portion 20 which projects downwards from the bottom edge of the wall 18, so that a drain 21 is formed in the lower horizontal frame portion for water accumulating between the outer wall 18 and the wall portion 20, which covers the outside of a wood main frame profile 22.

An inward ascending partition wall 23 is moreover connected to the outer wall 18 and covers the upside of the main frame profile 22 but is spaced therefrom, except for a narrow contact zone 24, which may rest on a rib 25 projecting from the main frame profile 22.

The free end of the transverse wall 23 abuts on a weather strip 26, which is retained in a groove 27 in the flange part 12 projecting from the profile 2.

The partition wall 23 is connected to the outer wall 18 by narrow wall portions 28 and 29, of which the latter together with the transverse wall 19 forms a groove 30 for retention of one side of an angle joint 31 as shown in fig 3.

In the main frame element shown in fig 1, outlets 32 and 33 for drainage of water have been provided in the bottom wall of the profile 2 and in the transverse wall 28. Water that may accumulate in the water collecting chamber 35, delimited by the rail profiles 2 and 17, will via the oblique partition wall 23, which forms a draining surface be discharged through the outlet 23 to the outlet 21.

The rail profile 17 is fastened to the main frame profile 22 by snap-locking with catches 34 made of plastic which are nailed or stapled to the frame profile 22.

In the upper horizontal frame and main frame portion there is no opening for water flow in the transverse wall 19 and 28 and the rail profile 2, and the up-turned slit between the wall part 20 and the main frame profile 22 is covered by a flashing 36.

The angle joint 31 has two legs at right angles to each other which, as shown in fig 3, each comprises a part 37 in close abutment on the inside of the outer wall of the rail profile 17 in the groove 30 and an inward projecting oblique part 38 in close abutment on the underside of the oblique partition wall 23 in the space between the latter and the upside of the main frame profile 22 beyond the projecting rib 25.

In the illustrated mounting of the angle joint 31, the groove 39 formed between the parts 37 and 38 as shown in fig 4 will cause water which percolates into the collecting chamber through the mitred frame to be drained from the joint and discharged through the out-

lets 33 and 21, thus minimizing the risk of damage caused by humidity.

Grooves 40 and 41 in the wood main frame 10 and the wood main frame 22 serve as known in the art to receive closing and pivoting fittings not shown which are thus placed in the dry zone of the window structure.

Claims

1. A frame structure mainly for inward opening windows or glazed doors, of the type which comprises an internal wood frame (10) adapted to an internal wood main frame (22) and an external frame covering (17) of corrosion resistant rail profiles, mainly of aluminium, which rails (17) extend from a weather strip (13) engaging an edge portion of the outer side of a thermo pane (1) and cover the wood profiles (10, 22) of the frame and main frame to protect these against the action of the weather, **characterized** in that a comparatively narrow edge portion of the thermo pane (1) on the inside of this is firmly connected to a projecting flange portion (4) on a rail profile (2) designed as a relatively flat edge fillet, which on the outside is connected to a glazing strip profile (3) for retention of said weather strip (13) and is designed on the inside to cover the outside of the wood frame (10), the external covering rail profiles (17) having an outer wall (18) connected with an inward projecting oblique partition wall (23), which in the lower horizontal frame portion partly provides a draining surface in a water collecting chamber delimited by the frame covering and said edge fillet profile (2) and serving at the same time as a ventilation duct along the circumference between the frame and the main frame, and partly together with a wall portion (20) inside the outer wall covers the part of the wood main frame (22) which projects beyond the wood frame (10), but is mainly spaced from same.
2. A frame structure as claimed in claim 1, **characterized** in that the edge portion of the thermo pane (1) is fastened to the projecting flange portion (4) of the edge fillet profile (2) by means of double-faced adhesive tape (8).
3. A frame structure as claimed in claim 1 or 2, **characterized** in that in the transverse wall portions (19, 28) of the lower horizontal transverse frame part, outlets (19, 33) are provided between the outer wall (19) of the frame covering and said partition wall (23) for drainage of water from the collecting chamber.
4. A frame structure as claimed in claim 1, 2 or 3,

characterized in that the water collecting chamber (35) is sealed against the outside of the wood frame (10) by means of a weather strip arranged between the inner edge of the partition wall (23) of the frame covering and a fastening flange (12) projecting downwards from the edge fillet profile.

5. A frame structure as claimed in any of the preceding claims, **characterized** in that the frame covering (17) is fastened to the wood main frame (22) by snap-locking with plastic catches fastened on the wood main frame.
6. A frame structure as claimed in any of the preceding claims, **characterized** in that the rail profiles (17) of the frame covering are mitred in a rectangular frame shape by means of angle joints (31), the legs of which each comprises a part (36) in close abutment on the inside of the outer wall (18) of the rail profile (17) in a groove (30) arranged therefor and an inward projecting oblique part (37) in close abutment on the underside of partition wall (23) between same and the upside of the wood main frame profile (22), whereby a mainly cross-sectionally V-shaped groove between said parts in the lower horizontal frame portion serves to drain off water from the angle joint.
7. A frame structure as claimed in any of the preceding claims, **characterized** in that the total width of the wood frame and the wood main frame measured at main frame level does not exceed 78 mm.



European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 91610079.5

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.')
A	CH-A5- 624 449 (HARTMANN & CO. AG) *Figure 5*	1-7	E 06 B 3/30
A	--- EP-A2-0 304 830 (FIRMA CHR. AHRENS) *Figure 2*	1-7	
A	--- SE-B- 446 471 (LÄMPÖLASI KY) *Figure 3*	1-7	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.')
			E 06 B
Place of search		Date of completion of the search	Examiner
STOCKHOLM		28-11-1991	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	

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