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(54) **System of main carrying profiles**

(57) The present Idea is referred to a **System Of Main Carrying Profiles** in metal and alloy, with cavities obtained on the profiles, for the internal or external coupling with any kind of material, different or the same, which joining through snaps, assemblies, dowels or any kind of accessories make it unique, practical, sturdy, economic, firm, thermally and acoustically insulated.

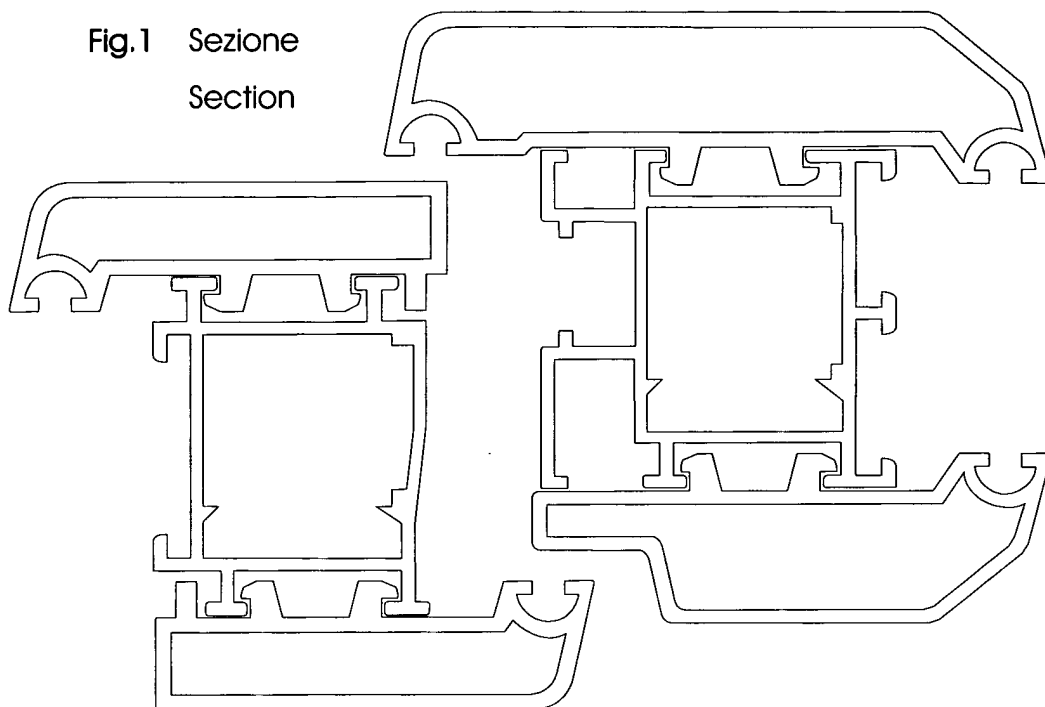
The Idea is innovative and original for the production of frames. It lends it-self to work any kind of system: rabbit, overlapping, level, coplanar, semi-coplanar, with open joint, with thermal break, etc. and for multiple typologies of frame: opening at sashes, external, sliding, par-

allel sliding, lift and slide, bifolding, fixed, blinds, shutters, etc.

Further it uses for the handling and for the production of the various typologies hardware and accessories already available on the market. Thanks to this new product, the production of frames presents remarkable production benefits like: reducing the production times, technological innovation, saving on warehouse lying and on waste, stability of the frame.

On plus if coupled with equal or different materials it assumes particular forms and shapes which render it aesthetically unique.

Fig.1 Sezione
Section



Description

STATE OF THE ART AND TECHNICAL PROBLEM

[0001] Actually the production of frames in the various materials (**wood, aluminium, PVC**) presents (one regarding the other) different disadvantages according to the employed material.

[0002] The wooden frame deforms it-self in contact with atmospheric agents.

[0003] The aluminium frame suffers from thermal jolts.

[0004] The PVC frame curves it-self and is in need of a central reinforcement.

[0005] Further for the production of frames with openings: *sash, sliding, bifolding*, etc... and in the various systems (*level, overlapping, coplanar, semi-coplanar, with open joint, with thermal break, rabbet, etc.*) for each variant listed above, different profiles are employed each with different accessories according to the used system.

DESCRIPTION AND SOLUTION OF THE TECHNICAL PROBLEM

[0006] The object of the present Idea is a new **System of Main Carrying Profiles** in various metals and alloys for the realization of frames with the following characteristics: simplicity, economic competitiveness, stability, adaptability, sturdiness, practicality, thermal and acoustical isolation.

[0007] This new innovative and original System offers a range of carrying profiles which are easily in position to lend them-self (each one by it-self) to multiple employments and to all the requirements of the producer, offering contemporaneously: high mechanical strength, reduced contribution of material with the consequence of decreased costs, guaranties of reliability and security in use.

[0008] Actually for the production of frames with various openings in the various systems, each time different profiles and accessories are used according to the employed system. With the new Idea the various profiles used are remarkable reduced since the **Main Carrying Profile** is the same in all kind of systems and in all typologies; it does not need a new line of accessories since it uses the ones existing already on the market and the joining of the corner to construct the frame or the sash is done through corner cleat positioned in the internal of the same profile. The **Main Carrying System** allows through **cavities** obtained internal as well as external of the profile, the **coupling** with materials of different forms, shapes and colours. This coupling is **compatible** with all the materials of any nature (wood, PVC, aluminium, steel, etc.); further the **cavities** can be structured or shaped according to the employed accessories or to the anchorage system to the material that is used to produce the frame.

[0009] This **coupling** made with suitable materials allows: **optimal thermal and acoustical isolation, lack**

of maintenance (as for example in the case of external coated PVC profiles and internal wooden profiles), velocity and simplicity in assembly (through corner cleat), **consequent reducing** of labour costs.

[0010] This coupling allows even the realisation of an **aesthetically and technically different** product according to the employed materials.

[0011] An other characteristic of the system is **its reversibility**, which allows the double working (level as well as overlapping) and is usable for the realisation of all typologies of frames (sash, bifolding, sliding, glazed, fixed, etc.).

[0012] With this system even the production costs are reduced since the same profile is used for more typologies of frames, consequently "the waste" (the part of the raw material no more useable in the production cycle) can be recycled. For example, with the old systems the segment of a material had to be thrown away or had to be employed only again for the same typology of frame. With this System instead, the same segment, which, as already said, acts as sash, frame, is employed for the realisation of sliding doors, sash doors, bifolding doors, for frames in PVC, aluminium, wood, is easier to be recycled.

[0013] The Idea further constitutes a **technological innovation** since it presents remarkable benefits compared to wood, aluminium and PVC.

[0014] In fact as known, the wooden frame, when in contact with atmospheric agents deforms, twists, breaks, curves it-self, etc.

[0015] The aluminium frame fears elevated thermal jolts, favouring in this way a remarkable thermal dispersion.

[0016] The PVC frame instead, in the production phase, is in need of a central reinforcement for its stability.

[0017] With the new System, when producing **wooden frames**, the deformation phenomena caused through atmospheric agents are eliminated thanks to the Main Carrying Profile which is coupled with the already shaped and pre-varnished industrially produced wooden profiles. Both profiles together allow even an increase in the production cycle velocity.

[0018] In the production of **aluminium frames**, thanks to the Main Carrying Profile a thermal and acoustical improvement is obtained due to the fact that the internal and external used profiles of the carrying profile do not have any contact.

[0019] When producing **PVC frames** the bending problem is overcome thanks to the Main Carrying Profile which substitutes the reinforcement earlier needed increasing the stability of the frame.

Reassuming the Idea thanks to

[0020]

1 - the Main Carrying System (in various metals, alloys, etc.)

2 - the coupling internal as well as external with the desired materials allows:

- multiple technical solutions;
- multiple aesthetical solutions;
- a perfect sealing with high thermal and acoustical values extended in time;
- increase in security against intrusion;
- elevated stability and the widest guaranties of reliability and security in use;
- lack of maintenance (if PVC or aluminium are used external);
- possibility of substitution or repair of the ruined or unhinged pieces.

[0021] The described **System of Main Carrying Profiles** presents a **highly competitive** and simplified realisation.

[0022] The task described above and the multiple aims and typologies of use with their associated characteristics and advantages, are going to result evident through the illustration of the principal profiles and through some indicative examples.

Figure 1: illustration of a section with the characteristic of a **box-shield** body in metal, alloy, etc. coupled internal as well as external with other materials, which joined mould the complete product. This represents a **"two gasket system"** with the use of **perimetric hardware**.

Figure 2: (main carrying profile "frame")

Represents a profile characterized of a **box-shield body** with: cavities (C-D) placed respectively at the internal and external of the frame, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;
- with plugs or commercial accessories.

The cavity (E) placed on the side of the carrying frame allows the casing of the gaskets or of the necessary accessories for the fixing on the wall. The room (F) achieved in the internal part of the carrying frame allows the insert of the corner cleats needed for the assembly of the profiles.

Figure 3: (main carrying profile "sash")

Represents a profile characterized of a box-shield body similar to the carrying frame, since it presents the same cavities (C-D) and room (F).

It is distinguished by the presence of: a further cavity (G) placed on the external side of the carrying sash, which allows the casing of the movement fittings or ribbon hardware for the opening and closing of the sash; a further cavity (H) placed on the internal side of the sash which allows the housing of the profile of glazing beads.

Figure 4: illustration of a section with the characteristic of a box-shield body in metal, alloy, etc. coupled internal as well as external with other materials, which joined mould the complete product. This represents an **"open joint"** system with the use of **perimetric hardware**.

Figure 5: (main carrying profile "frame")

Represents a profile characterized of a box-shield body with: cavities (C-D) placed respectively at the internal and external of the frame, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;
- with plugs or commercial accessories.

The cavity (E) placed on the side of the carrying frame allows the casing of the gaskets or of the necessary accessories for the fixing on the wall. The room (F) achieved in the internal part of the carrying frame allows the insert of the corner cleats needed for the assembly of the profiles. The cavity (I) placed on the internal side of the carrying frame allows the insert of the central fin gasket which characterises the "open joint" system.

Figure 6: (main carrying profile "sash")

Represents a profile characterized of a box-shield body similar to the carrying frame, since it presents the same cavities (C-D) and room (F).

It is distinguished by the presence of:

- a further cavity (G) placed on the external side of the carrying sash, which allows the casing of the movement fittings or ribbon hardware for the opening and closing of the sash; a further cavity (H) placed on the internal side of the sash which allows the housing of the profile of glazing beads. A particular shape obtained ahead of the cavity (G) allows the lay-down of the central fin gasket which characterises the **"open joint"** system.

Figure 7: illustration of a section with the characteristics of a box-shield carrying body in metal, alloy, etc. coupled internal as well as external with other materials which joined mould the complete product. This represents an **"open joint"** system with the use **Hardware to be applied**.

Figure 8: (main carrying profile "frame")

Represents a profile characterized of a box-shield body with: cavities (C-D) placed respectively at the internal and external of the frame, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;

- with plugs or commercial accessories.

The cavity (E) placed on the side of the carrying frame allows the casing of the gaskets or of the necessary accessories for the fixing on the walls. The room (F) achieved in the internal part of the carrying frame allows the insert of the corner cleats needed for the assembly of the profiles. The cavity (I) placed on the internal side of the carrying frame allows the insert of the central fin gasket which characterises the "open joint" system.

The cavity (L) placed on the internal side of the carrying frame allows the casing of the Movement fittings.

Figure 9: (main carrying frame "sash")

Represents a profile characterized of a box-shield body similar to the carrying frame, in fact it presents the same cavities (C-D-L) and room (F).

It is distinguished by the presence of a further cavity (H) placed on the internal side of the sash, which allows the casing of the glazing beads. A particular shape obtained ahead of the cavity (L) allows the lay-down of the central fin gasket which characterises the "open joint" system.

Figure 10: illustration of a section with the characteristic of a box-shield body in metal, alloy, etc. coupled internal as well as external with other materials, which joined mould the complete product. This represents a "two gasket - increased sash" system with the use of **perimetric hardware**.

Figure 11: (main carrying profile "frame")

Represents a profile characterized of a box-shield body with: cavities (C-D) placed respectively at the internal and external of the frame, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;
- with plugs or commercial accessories.

The cavity (E) placed on the side of the carrying frame allows the casing of the gaskets or of the necessary accessories for the fixing on the walls. The room (F) achieved in the internal part of the carrying frame allows the insert of the corner cleats needed for the assembly of the profiles.

Figure 12: (main carrying profile "increased sash")

Represents a profile characterized of a box-shield body similar to the carrying frame, since it presents the same cavities (C-D) and room (F).

It is distinguished by the presence of:

- a further cavity (G) placed on the external side of the carrying sash, which allows the casing of the movement fittings or ribbon hardware for the opening and closing of the sash; a further cavity

(H) placed on the internal side of the sash which allows the housing of the profile of glazing beads.

Figure 13: illustration of a section with the characteristic of a box-shield body in metal, alloy, etc. coupled internal as well as external with other materials, which joined mould the complete product. This represents an "open joint increased sash" system with the use of **perimetric hardware**.

Figure 14: (main carrying profile "frame")

Represents a profile characterized of a box-shield body with: cavities (C-D) placed respectively at the internal and external of the frame, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;
- with plugs or commercial accessories.

The cavity (E) placed on the side of the carrying frame allows the casing of the gaskets or of the necessary accessories for the fixing on the walls. The room (F) achieved in the internal part of the carrying frame allows the insert of the corner cleats needed for the assembly of the profiles. The cavity (I) placed on the internal side of the carrying frame allows the insert of the central fin gasket which characterises the "open joint" system.

Figure 15: (main carrying profile "increased sash")

Represents a profile characterized of a box-shield body similar to the carrying frame, since it presents the same cavities (C-D) and room (F).

It is distinguished by the presence of:

- a further cavity (G) placed on the external side of the carrying sash, which allows the casing of the movement fittings or ribbon hardware for the opening and closing of the sash; a further cavity (H) placed on the internal side of the sash which allows the housing of the profile of glazing beads. A particular shape obtained ahead of the cavity (G) allows the lay-down of the central fin gasket which characterises the "open joint" system.

Figure 16: illustration of a section in central rabbet with the characteristic of a box-shield carrying body in metal, alloy, etc. coupled internal as well as external with other materials which joined mould the complete product. This represents a "two gasket - increased sash" system with the use of **perimetric hardware**.

Figure 17: (central rabbet profile)

Figure 18: (main carrying profile "central rabbet")

Represents a profile characterized of a box-shield body with: cavities (**C-D**) placed respectively at the internal and external of the frame, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;
- with plugs or commercial accessories.

The cavity (**G**) placed on the internal side of the carrying profile, which allows the casing of the movement fittings or ribbon hardware for the opening and closing of the sash.

Figure 19: illustration of a section in central rabbet with the characteristic of a box-shield carrying body in metal, alloy, etc. coupled internal as well as external with other materials, which joined mould the complete product. This represents an **"open joint increased sash"** system with the use of **perimetric hardware**.

Figure 20: (central rabbet profile)

Figure 21: (main carrying profile "central rabbet")

Represents a profile characterized of a box-shield body with: cavities (**C-D**) placed respectively at the internal and external of the frame, for the coupling of all the desired - materials. The coupling systems are:

- snapping, internal as well as external of the cavity;
- with plugs or commercial accessories.

The cavity (**G**) placed on the internal side of the carrying profile, which allows the casing of of the movement fittings or ribbon hardware for the opening and closing of the sash. The cavity (**I**) placed on the internal side of the carrying profile allows the lay-down of the central fin gasket which characterises the **"open joint"** system.

Figure 22: illustration of a section in central rabbet with the characteristic of a box-shield carrying body in metal, alloy, etc. coupled internal as well as external with other materials which joined mould the complete product. This represents an **"open joint"** system with the use of hardware to be applied.

Figure 23: (central rabbet profile)

Figure 24: (main carrying profile "central rabbet")

Represents a profile characterized of a box-shield body with: cavities (**C-D**) placed respectively at the internal and external of the frame, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;

- plugs or commercial accessories.

The cavity (**I**) placed on the internal side of the carrying profile allows the lay-down of the central fin gasket which characterises the **"open joint"** system. The cavity (**L**) placed on the internal side of the carrying profile which allows the casing of the movement fittings.

Figure 25: (transverse profile for all systems)

Illustration of a transverse profile with the characteristic of a box-shield carrying body in metal, alloy, etc. coupled internal as well as external with other materials which joined mould the complete product.

Figure 26: (main carrying profile "transverse")

Represents a profile characterized of a box-shield body with: cavities (**C-D**) placed respectively at the internal and external of the transverse, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;
- with plugs or commercial accessories.

The cavity (**H**) placed on the external side of the profile allows the housing of the glazing beads. The internal of the carrying profile presents two plugs (**M**) for the screwing of the same profile to others.

Figure 27: (band profile for all systems)

Illustration of a band profile with the characteristic of a box-shield carrying body in metal, alloy, etc. coupled internal as well as external with other materials which joined mould the complete product.

Figure 28: (main carrying profile "band")

Represents a profile characterized of a box-shield body with: cavities (**C-D**) placed respectively at the internal and external of the band, for the coupling of all the desired materials. The coupling systems are:

- snapping, internal as well as external of the cavity;
- with plugs or commercial accessories.

The cavity (**H**) placed on the external side of the profile allows the housing of the glazing beads. The internal of the carrying profile presents two plugs (**M**) for the screwing of the same profile to others.

50 Claims

1. - System of main carrying profiles "frame" **characterised by** a metal box-shield body, connectable internal as well as external through specific cavities with any kind of materials, different or the same, which join to the carrying profile through snaps, hollows, dowels etc. Other cavities are placed respectively on the sides of the profile for the casing of gas-

kets, hardware and fixing systems with a room achieved on the internal of the same profile for the casing of the corner cleats.

2. - System of main carrying profiles "**sash**", as claimed in claim 1, **characterised by** the external lateral cavity for the casing of the hardware, internal lateral cavity for the casing of glazing beads profile, internal and external cavities for the coupling with other materials. With a room achieved on the internal of the same profile for the casing of the corner cleats. 5
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3. - System of main carrying profiles "**central rabbet**", as claimed in claim 1 and claim 2, **characterised by** external and internal cavities for the coupling with other materials, lateral cavities for the casing of hardware and gaskets. 15
4. - System of main carrying profiles "**transverse**", as claimed in claim 1, claim 2 and claim 3, **characterised by** external and internal cavities for the coupling with other materials, lateral cavities for the casing of the glazing beads profile and internal plugs for the screwing of the same profile to others. 20
25
5. - System of main carrying profiles "**band**", as claimed in claim 1, claim 2, claim 3 and claim 4, **characterised by** external and internal cavities for the coupling with other materials, lateral cavities for the casing of the glazing beads profile and internal plugs for the screwing the same profile to others. 30
6. - System of main carrying profiles, as claimed in claim 1, claim 2, claim 3, claim 4 and claim 5, **characterised by** cavities which can be structured or shaped according to the employed accessories or to the anchorage systems to the material to be used to produce the frame. The cavities allow the coupling to the main system to other materials. 35
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Fig.1 Sezione
Section

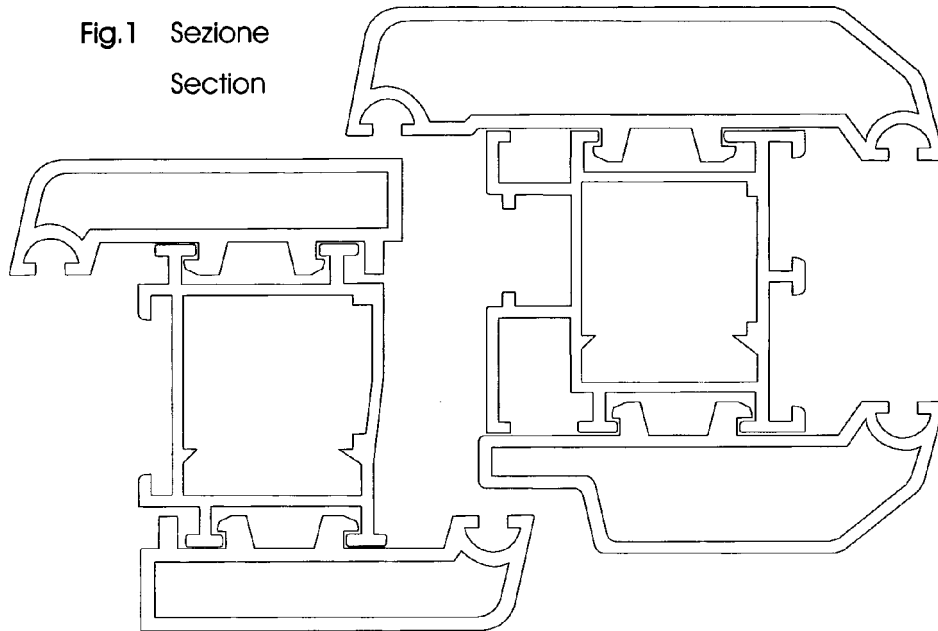


Fig.2 Sezione
Section
(Profilo portante centrale "telaio")
(Main carrying profile "frame")

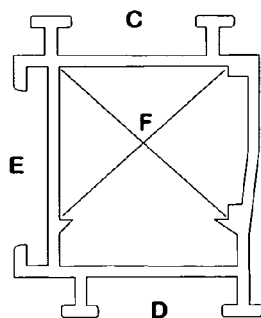


Fig.3 Sezione
Section
(Profilo portante centrale "anta")
(Main carrying profile "sash")

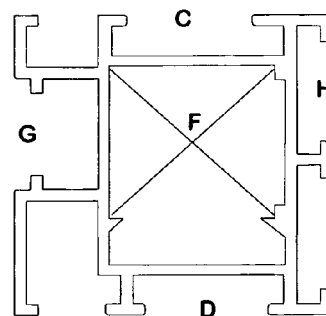


Fig.4 Sezione
Section

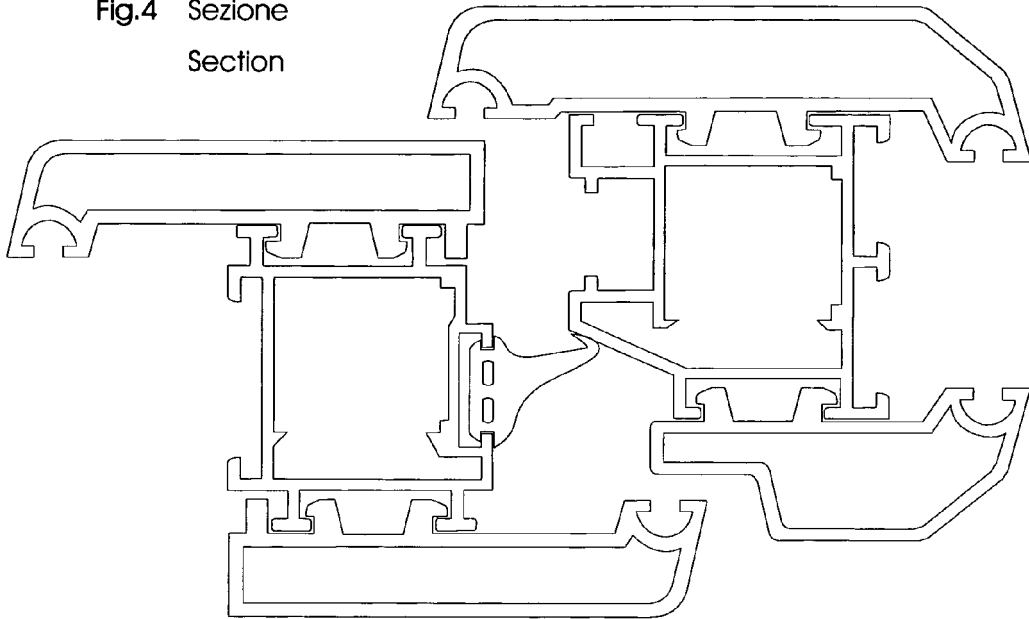


Fig.5 Sezione
Section

(Profilo portante centrale "telaio")
(Main carrying profile "frame")

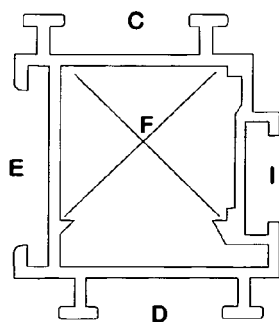


Fig.6 Sezione
Section

(Profilo portante centrale "anta")
(Main carrying profile "sash")

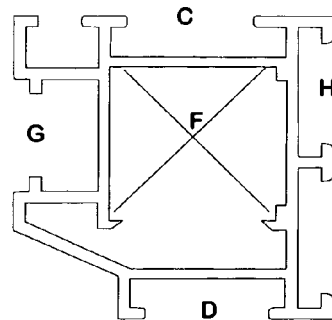


Fig.7 Sezione
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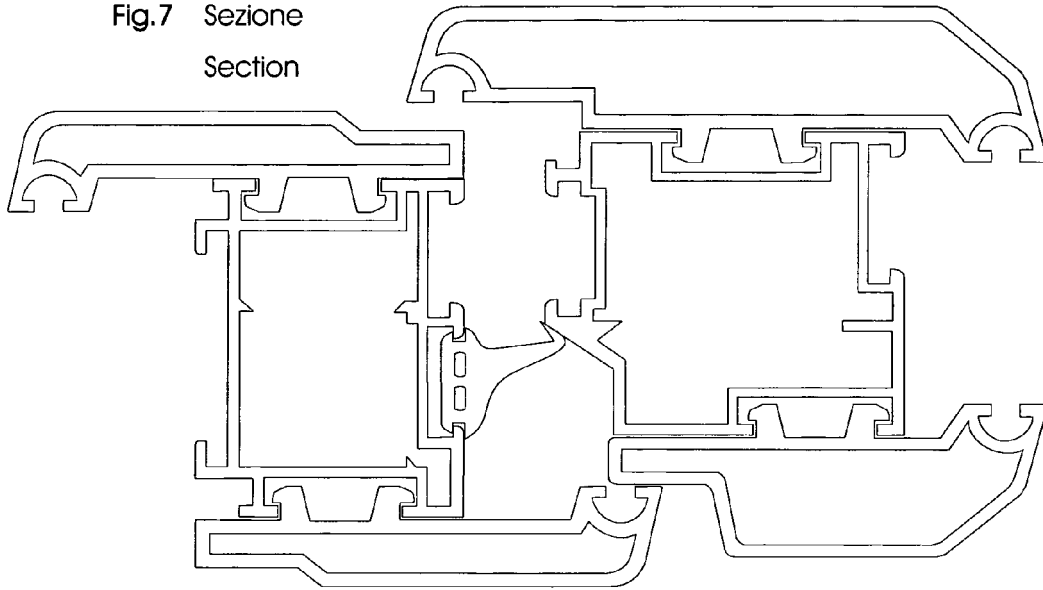


Fig.8 Sezione
Section
(Profilo portante centrale "telaio")
(Main carrying profile "frame")

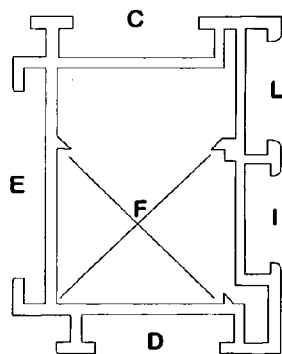


Fig.9 Sezione
Section
(Profilo portante centrale "anta")
(Main carrying profile "sash")

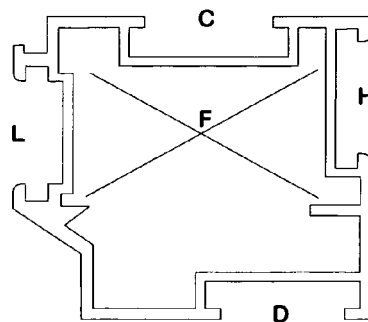


Fig.10 Sezione
Section

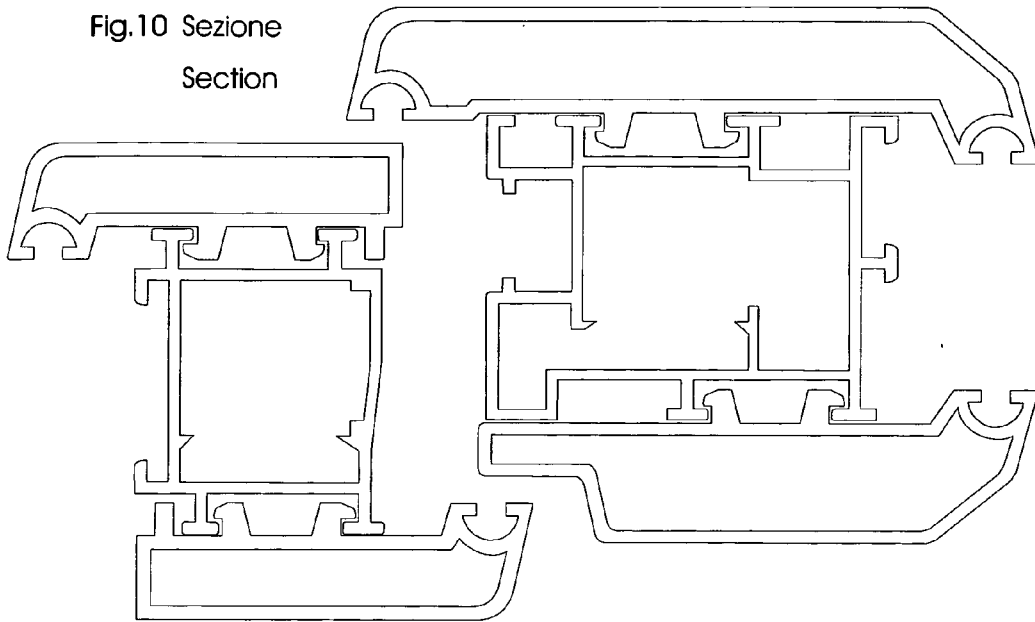


Fig.11 Sezione
Section

(Profilo portante centrale "telaio")
(Main carrying profile "frame")

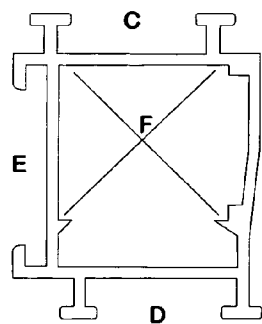


Fig.12 Sezione
Section

(Profilo portante centrale "anta")
(Main carrying profile "increased sash")

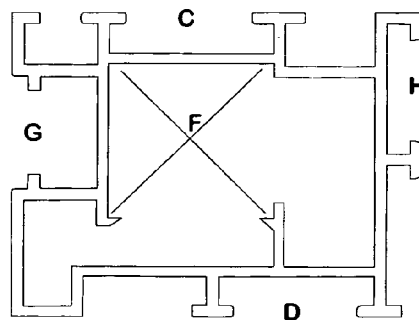


Fig.13 Sezione
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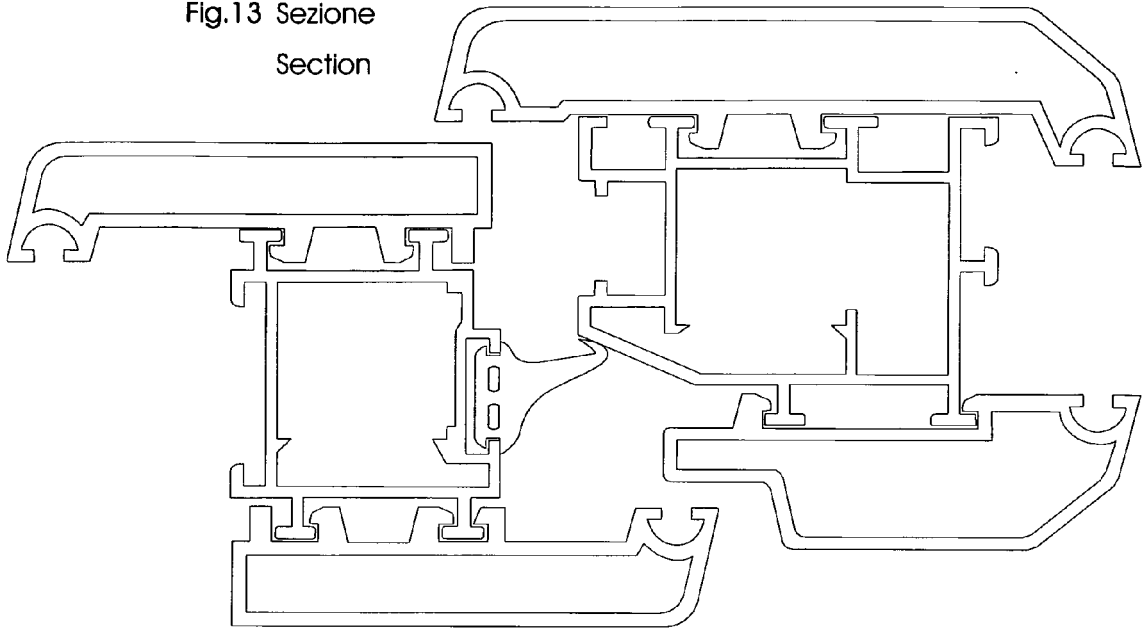


Fig.14 Sezione
Section

(Profilo portante centrale "telaio")
(Main carrying profile "frame")

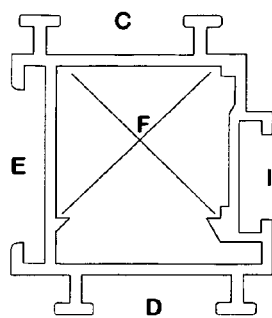


Fig.15 Sezione
Section

(Profilo portante centrale "anta")
(Main carrying profile "increased sash")

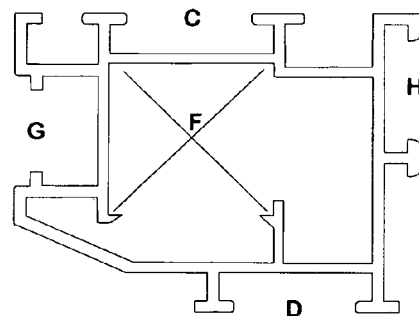


Fig.16 Sezione
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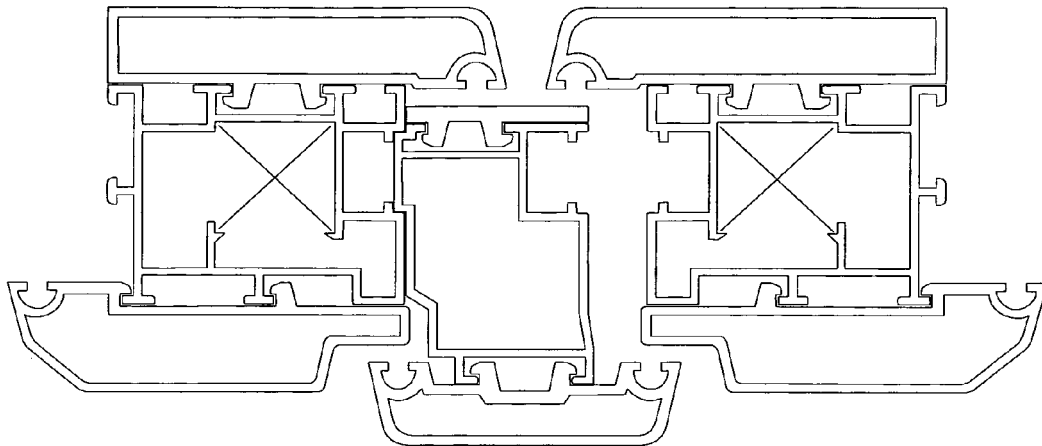


Fig.17 Sezione
Section
(Battuta centrale)
(Central rabbet profile)

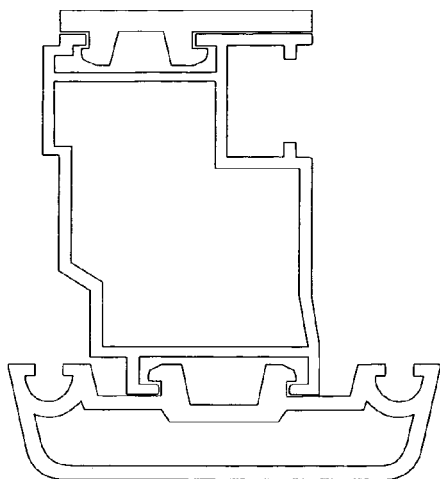


Fig.18 Sezione
Section
(Profilo portante centrale "battuta centrale")
(Main carrying profile "central rabbet")

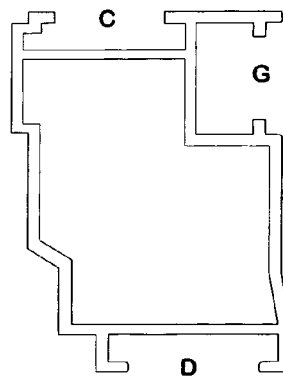


Fig.19 Sezione
Section

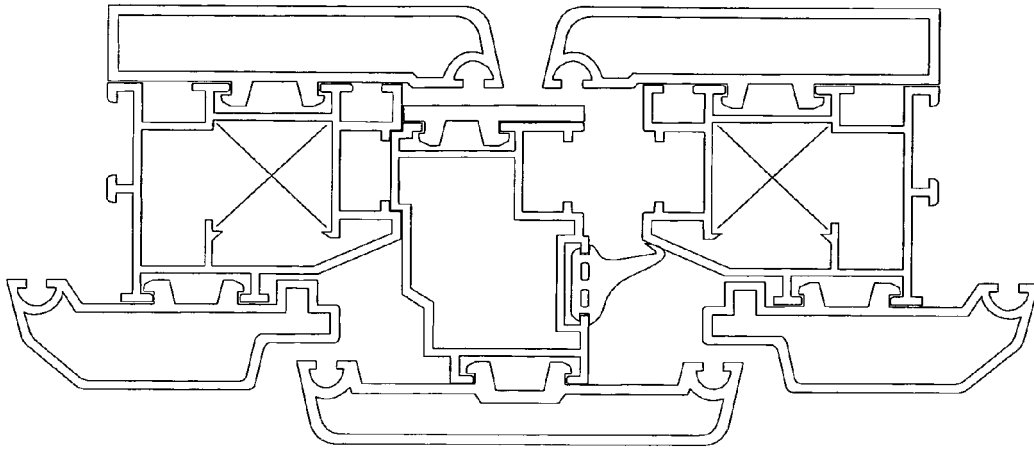


Fig.20 Sezione
Section
(Battuta centrale)
(Central rabbet profile)

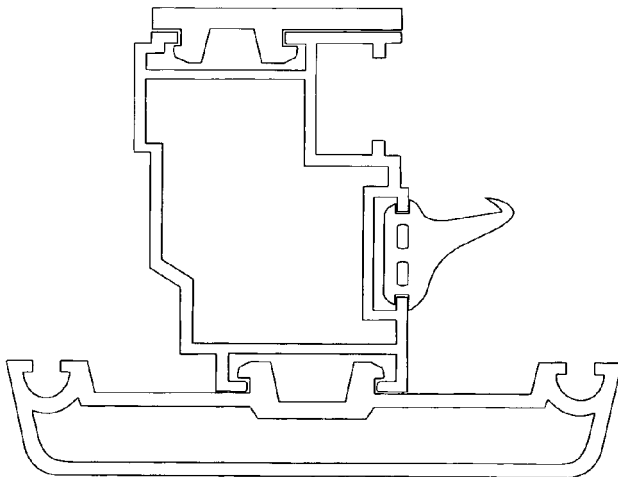


Fig.21 Sezione
Section
(Profilo portante centrale "battuta centrale")
(Main carrying profile "central rabbet")

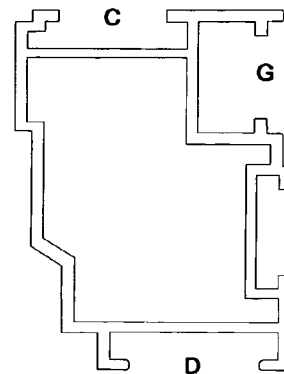


Fig.22 Sezione
Section

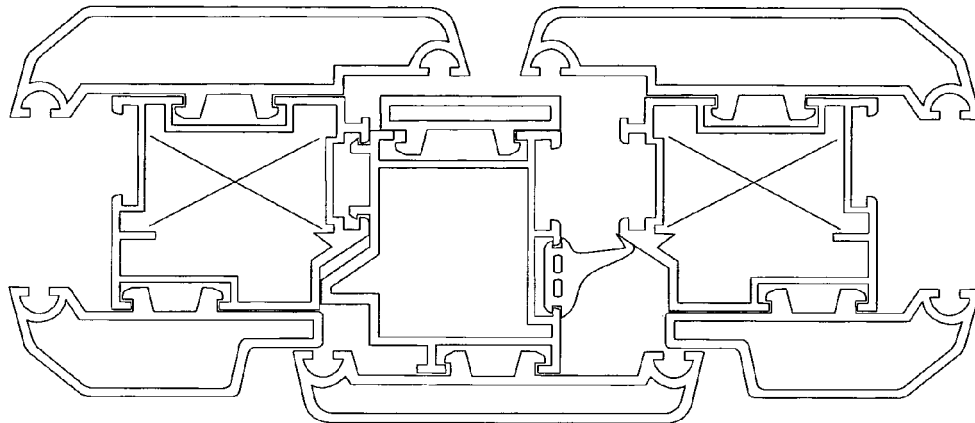


Fig.23 Sezione
Section
(Battuta centrale)
(Central rabbet profile)

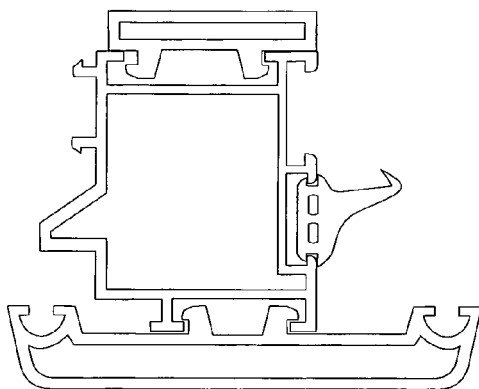


Fig.24 Sezione
Section
(Profilo portante centrale "battuta centrale")
(Main carrying profile "central rabbet")

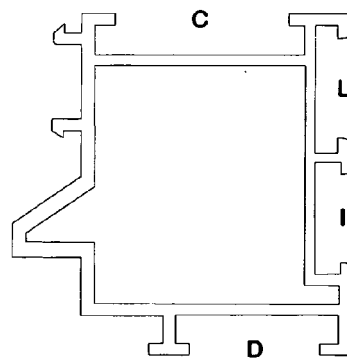


Fig.25 Sezione
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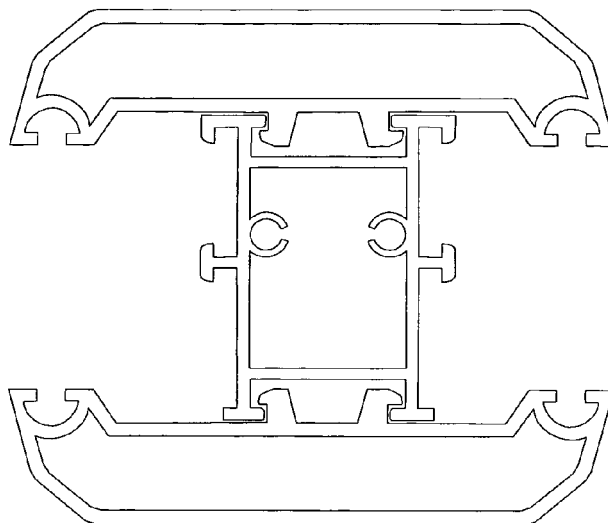


Fig.26 Sezione
Section

(Profilo portante centrale "trasverso")
(Main carrying profile "transverse")

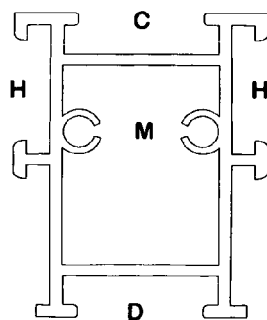


Fig.27 Sezione
Section

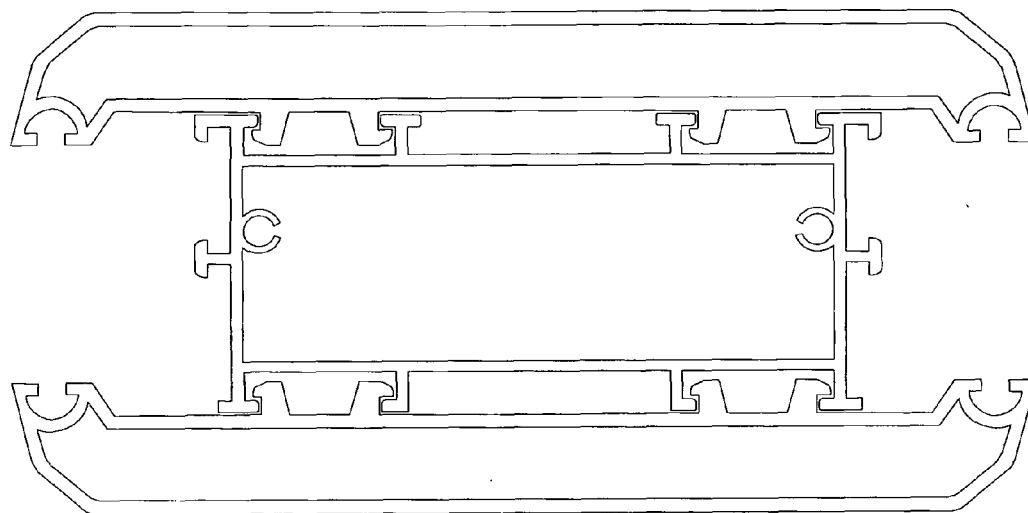


Fig.28 Sezione
Section
(Profilo portante centrale "fascione")
(Main carrying profile "band")

