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(54) TUBULAR FRAME FOR OUTSIDE AND INSIDE METAL DOORS, WITH INVISIBLE INSTALLATION AND THE POSSIBILITY OF BEING FIRE-RESISTIVE

(57) This invention refers to a new invisibly installed tubular steel frame for exterior and interior doors, which allows several types of assembly: flush to the wall in the opening direction, in the closing direction and assembled in a corridor, and also offers the possibility of being fire resistant. This new tubular frame is designed with the purpose of allowing the door leaf to be flush with the wall both in the opening direction and in the closing direction, and of also being installed with an extensible assembly capable of adjusting to the total width of the masonry wall and preventing thermal bridge.

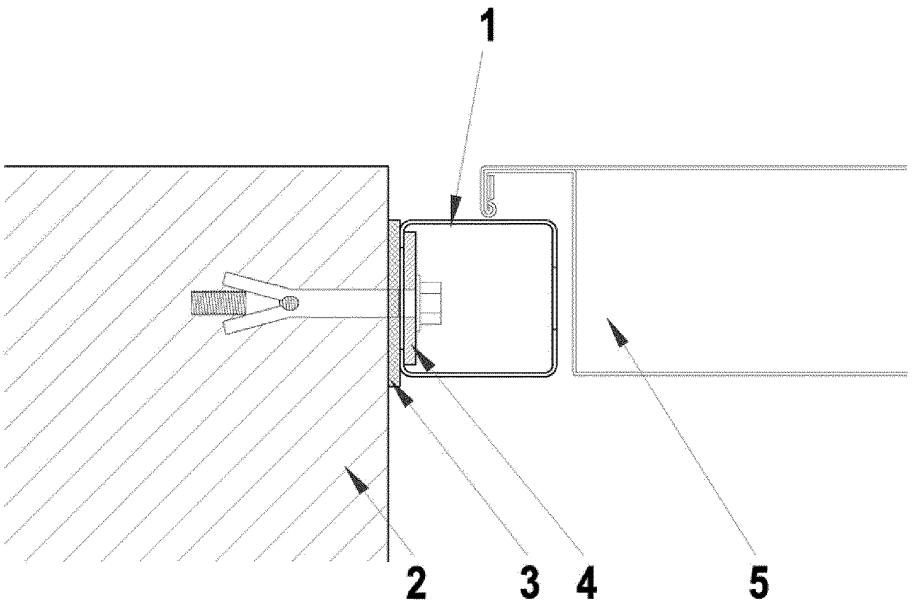

FIGURE 1

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Description

OBJECT OF THE INVENTION

[0001] This invention refers to a new invisibly installed tubular steel frame for exterior and interior doors, which allows various types of assembly and may possibly be fire resistant. This new tubular frame is designed with the purpose of allowing the door leaf to be flush with the wall and that it can also be installed with an extensible assembly capable of adjusting to the total width of the masonry wall.

BACKGROUND OF THE INVENTION

[0002] In the technical sector, the invention is part of the construction sector, in particular, the manufacture of hinged doors with steel frames, which may possibly be fire resistant.

[0003] In the state of the art, steel frame and fire resistant doors are well known, but in connection with the installation thereof, it is known that the frame is always visible as a rim around the door leaf, which aesthetically provides a poorer appearance to the door.

[0004] On the other hand, the installation of the preframe before the door frame is known, but the disadvantage is that carrying out this installation takes twice as long, since it is necessary to subsequently install a frame over the aforementioned preframe. Another disadvantage of this type of installation, is the space taken up in shipping which makes the total price of the door more expensive.

[0005] As for doors with invisible mechanisms, several existing models are known on the market. Such is the case of the invention ES 232427 U, which presents a door with an invisible security mechanism, but in which the frame and its installation remain visible. Or the invention ES 2334200 T1, which features an invisible installation hinge, but it does not hide the door frame assembly and does not offer the possibility to being fire resistant. As for hidden frames, the invention ES 0179714 U must be mentioned, which presents a semi-invisible frame, but it does not offer the possibility of being fire resistant and the leaf is not flush with the wall. Accordingly, the aforementioned inventions do not belong to the same technical sector as the present invention, since they cannot be used for the manufacture of hinged doors with a steel frame, with the possibility of being fire resistant.

DESCRIPTION OF THE INVENTION

[0006] The invention consists of an invisibly installed tubular steel frame, which allows the door leaf to be flush with the wall, that offers the possibility of being fire resistant and that allows several types of assembly, such that it solves the problems posed: the installation of a preframe is not necessary and it improves both the speed of commissioning and the aesthetic and mechanical qualities of the door, as explained below.

[0007] The invention consists of a tubular frame that can act as a fire door and is made of steel in order to solve the problems posed: To achieve an invisible installation, so that it improves the assembly of the product in terms of the aesthetics, speed and quality of construction.

[0008] As it is a tubular steel frame, several types of installation are allowed, either with one side of the door leaf flush with the wall, in the opening direction, one side of the door leaf flush with the wall, in the closing direction or installation in a corridor.

[0009] The tubular frame is fixed to masonry wall by means of an anchor plate which is mechanically fixed to the tubular frame and screwed to the wall, installing between wall and frame a wall gasket that absorbs the imperfections of the construction and confers insulation to the assembly. Once the tubular frame has been assembled, this invention includes the possibility of being installed together with a telescopic adjustable frame assembly (patent number P201400334), which allows the assembly to be adjusted according to the thickness of the masonry wall.

[0010] A pressure angle is screwed to the tubular frame, the former being composed of two metal profiles, joined at a minimum distance by welding points, the interior profile is L-shaped at 90°, and the exterior profile is similar to the former with an end fold. The pressure angle serves as a guide to adequately accommodate the adjustable frame, which can be adjusted longitudinally depending on the construction specifications.

[0011] The telescopic adjustable frame is assembled once the construction is finished, such that the installation time is shorter, since the shape of the pressure angle, which behaves as a fixed measurement guide for the adjustable frame, makes the installation easier, because screwing is avoided, and it is only necessary to fit the parts, since the guide has the minimum distance to serve as a fastener and it regulates the total length of the invention, as the adjustable frame can run the full length of the pressure angle. The geometry of the assembly confers the telescopic adjustable frame an improvement in terms of physical, mechanical and resistance characteristics, since this section has a high inertia against external stresses; that is, it tends to remain stable against external mechanical aggressions.

[0012] Due to the discontinuities in the constructive elements, thermal bridges are produced, which are detrimental in terms of thermal insulation and fire resistance. A thermal bridge is a sudden temperature change between two elements, so it should be avoided whenever possible, because it allows the passage of air, both cold and hot, and even fire. With this object, the possibility of installing an insulation joint between the tubular frame and the aforementioned telescopic supplement is envisaged, which confers to the assembly insulating qualities against various elements such as fire, air, water, wind or noise. These insulating qualities of the joint are due to the physical properties that it transfers to the assembly:

thermal conductivity, resistance to the passage of heat and its geometry, as it blocks the passage of air between the tubular frame and the extensible supplement, preserving in this way the watertightness of the assembly.

[0013] The simplicity of the tubular frame design as a closed section confers a mechanical resistance greater than that of open section frames, as it better resists the torques to which the door can be subjected, produced by its own weight or by external mechanical agents.

DESCRIPTION OF THE DRAWINGS

[0014] Below, in order to allow a better understanding of this specification, and forming an integral part thereof, four figures are provided which, by way of illustration and without limiting the scope of the invention, represent the object thereof.

Figure 1.-Shows a horizontal section of the tubular frame (1) mechanically fixed to an anchor plate (4), which is screwed to the wall (2), placing a wall gasket (3) between the tubular frame (1) and the wall (2), making the wall (2) and the leaf (5) flush in the opening direction, and aligning the tubular frame (1) and the leaf (2) in the closing direction.

Figure 2.-Shows a horizontal section of the tubular frame (1) mechanically fixed to an anchor plate (4), which is screwed to the wall (2), placing a wall gasket (3) between the tubular frame (1) and the wall (2), making the leaf (5) assembly, the tubular frame (1) and the wall (2) flush in the closing direction.

Figure 3.-Shows a horizontal section of the tubular frame (1) and the leaf (5), wherein the tubular frame (1) is mechanically fixed to the anchor plate (4) which is screwed to the corridor wall (2), placing a wall gasket (3) between the tubular frame (1) and the wall (2).

Figure 4.-Shows a horizontal section of the tubular frame (1) mechanically fixed to an anchor plate (4), which is screwed to the wall (2), placing a wall gasket (3) between the tubular frame (1) and the wall (2), making the wall (2) and the frame (5) flush in the opening direction, and in the closing direction, placing an insulation joint (6) and screwing to the tubular frame (1) **the telescopic adjustable frame,** consisting of an adjustable frame (8) and a pressure angle (7), the assembly covers the total thickness of the wall (2).

PREFERRED EMBODIMENT OF THE INVENTION

[0015] The invention is applied to exterior and interior hinged doors with a tubular steel frame, (1) mechanically fixed to an anchor plate (4), which is screwed to the wall (2), placing a wall gasket (3) between the tubular frame (1) and the wall (2), making the wall (2) and the leaf (5) flush in the opening direction and aligning the tubular frame (1) and the leaf (2) in the closing direction.

[0016] A second embodiment of the invention is that the tubular frame (1) is mechanically fixed to an anchor plate (4), which is screwed to the wall (2), placing a wall gasket (3) between the tubular frame (1) and the wall (2), making the leaf (5) assembly, the tubular frame (1) and the wall (2) flush in the closing direction.

[0017] A third embodiment of the invention is that the tubular frame (1) is mechanically fixed to an anchor plate (4) which is screwed to the corridor wall (2), placing a wall gasket (3) between the tubular frame (1) and the corridor wall (2).

[0018] A fourth embodiment of the invention is that the tubular frame (1) is mechanically fixed to an anchor plate (4), which is screwed to the wall (2), placing a wall gasket (3) between the tubular frame (1) and the wall (2), making the wall (2) and the leaf (5) flush in the opening direction, and in the closing direction, placing an insulation joint (6) and screwing the tubular frame (1) the telescopic adjustable frame, consisting of an adjustable frame (8) and a pressure angle (7), the assembly covers the total thickness of the wall (2).

[0019] Having sufficiently described the nature of the present invention, as well as how to put it into practice, a more extensive its explanation is not considered necessary for anyone skilled in the art to understand its scope and the advantages derived therefrom, while it is stated that, within its essential nature, it may be put into practice through other embodiments which differ in detail from the one indicated as an example, and which will also achieve the protection sought provided that these do not alter, change or modify its fundamental principle.

Claims

1. Invisibly installed tubular frame, for exterior and interior doors, which offers the possibility of being fire resistant, **characterized by** a tubular frame (1) and the leaf (5), wherein the tubular frame (1) is mechanically fixed to an anchor plate (4), which is screwed to the wall (2), placing a wall gasket (3) between the tubular frame (1) and the wall (2).

2. Invisibly installed tubular frame, according to claim 1, **characterized in that** the wall (2) and the leaf (5), are flush in the opening direction, and that the tubular frame (1) and leaf (2) are aligned in the closing direction.

3. Invisibly installed tubular frame, according to claim 1, **characterized in that** the leaf (5) assembly, the tubularframe (1) and the wall (2) are flush in the closing direction.

4. Invisibly installed tubular frame, according to claim 1, **characterized in that** the assembly can be as-

sembled in directly in a corridor, without needing to make a partition on which to install the tubular frame (1) and the leaf (5).

5. Invisibly installed tubular frame, according to claim 1; **characterized in that** the wall (2) and the leaf (5) are flush in the opening direction, and **in that** in the closing direction, placing an insulation joint (6) and screwing to the tubular frame (1) the telescopic adjustable frame, consisting of an adjustable frame (8) and a pressure angle (7), the assembly covers the total thickness of the wall (2).

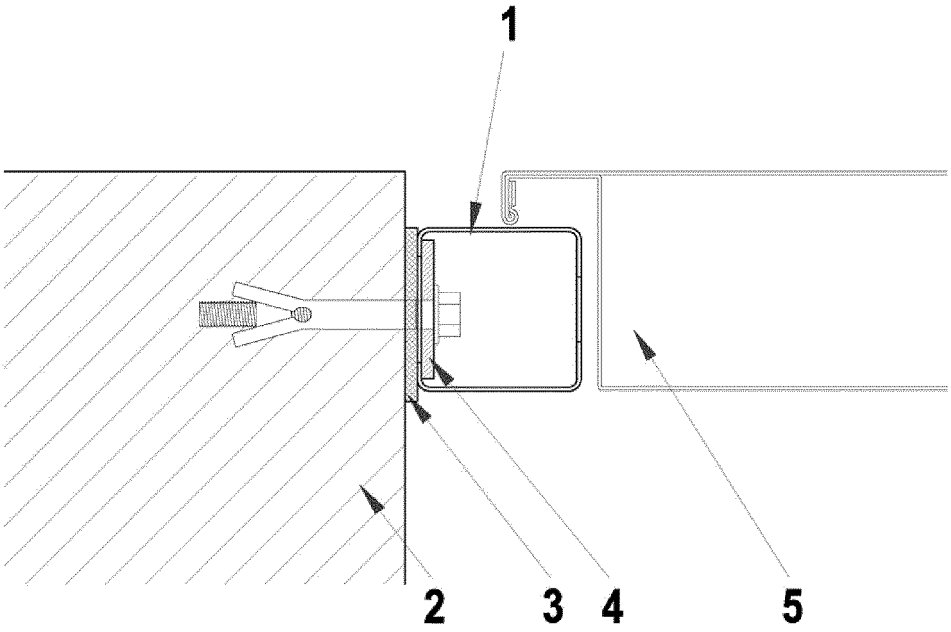

FIGURE 1

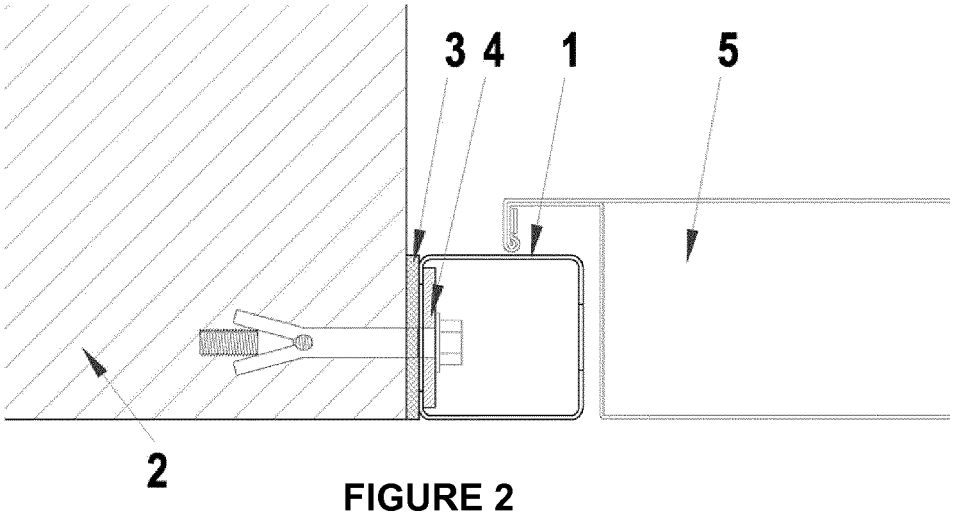

FIGURE 2

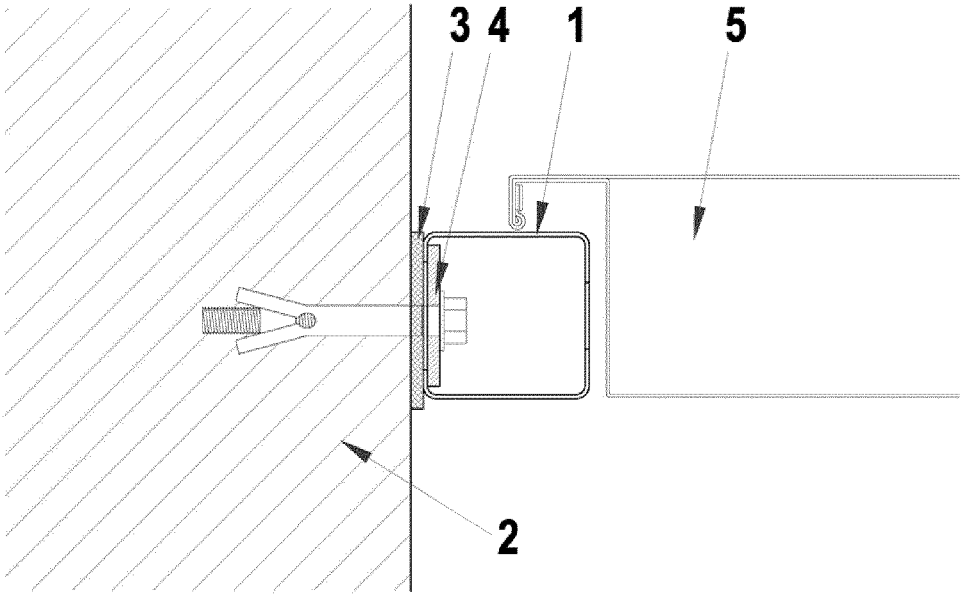

FIGURE 3

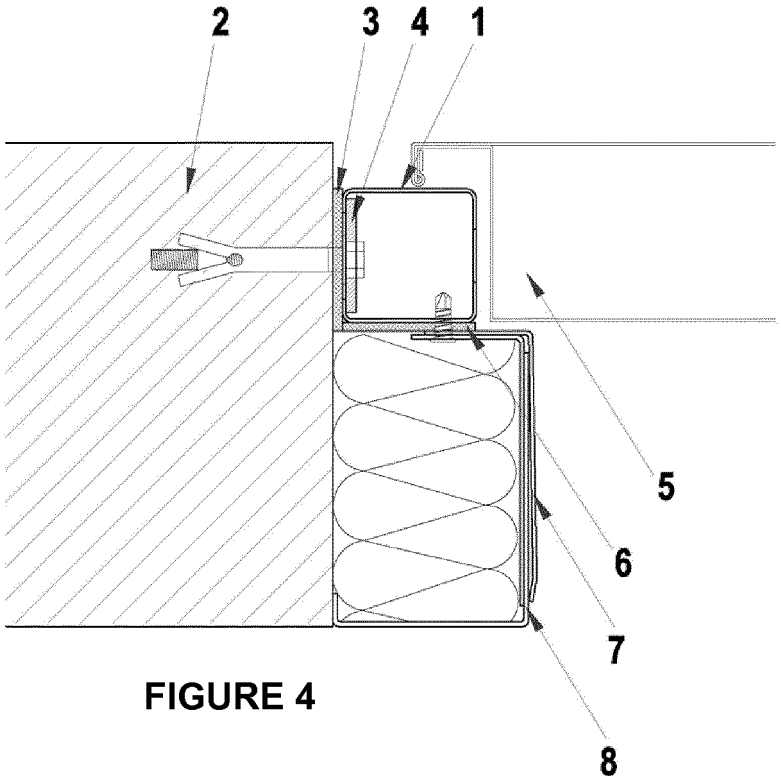

FIGURE 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2015/000149

A. CLASSIFICATION OF SUBJECT MATTER

E06B5/16 (2006.01)
E06B1/12 (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	ES 279372U U (EMPRESA NACIONAL DE ALUMINIO, S. A.) 16/11/1984, Pages 5-6; figures 1-2	1-5
Y	DE 2914467 A1 (DEUTSCHER STAHLBAU VERBAND DST) 16/10/1980, Page 9; figures 1-3	1-5
A	ES 2295284T T3 (REYNAERS ALUMINIUM NV) 16/04/2008, Pages 3-4; figures 1-3	1, 5
A	DE 2604777 A1 (KAEUFERLE STAHLBAU J) 11/08/1977, Pages 13-18; figures 1-6	1,5
A	ES 2137034T T3 (SCHUECO INT KG) 01/12/1999, Pages 3-5; figures 1-4	1, 5
A	DE 19625643 A1 (SOMMER METALLBAU STAHLBAU GMBH) 02/01/1998, Columnas 2-3; figure 1	1,5

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance.
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents , such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30/11/2015	**(02/12/2015)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer J. Hernández Cerdán Telephone No. 91 3495339

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2015/000149

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Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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- ES 2334200 T1 **[0005]**
- ES 0179714 U **[0005]**
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