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(54) **CONNECTION SYSTEM**

(57) The invention relates to a connection system comprising at least one support element and at least one strip defining a strip connection plane. The at least one support element comprises one from among first retaining means and second retaining means, and the at least one strip comprises the other from among first retaining means and second retaining means. The second retaining means comprise a receiving area adapted to receive the first retaining means in the direction of the strip connection plane and thereby obtain a fixing position of the at least one strip, such that when the at least one strip is in said fixing position, the second retaining means impede extracting the strip in a direction contained in the strip connection plane.

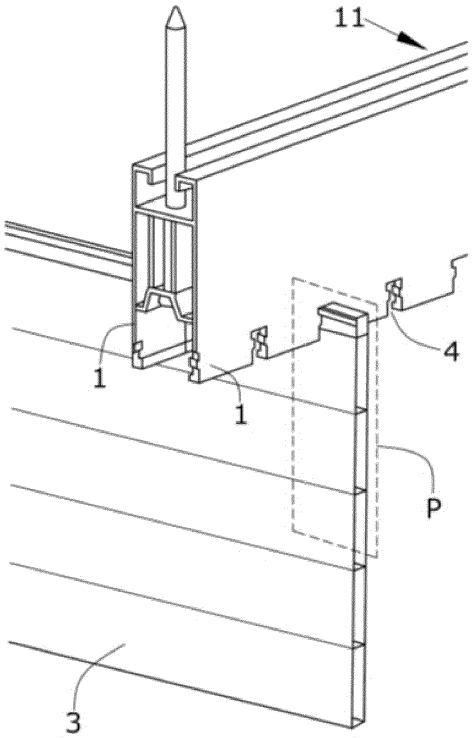

FIG.2

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Description

Object of the Invention

[0001] The present invention relates to a connection system for connecting decorative elements to be used on ceilings or walls.

Background of the Invention

[0002] There are a number of reasons for connecting decorative elements on a ceiling of either a shop or of any other type of room.

[0003] Known solutions normally use decorative elements manufactured from aluminum. In order for said elements to be safe, the decorative element is not very thick. As a result, these decorative elements may not be planar because since they cannot be very thick, the elements are limited due to buckling and bending issues. Something similar occurs when other materials are used.

[0004] These decorative elements are usually attached to rails or supports fixed on the ceiling by means of press fitting in a notch: since the decorative elements are thin sheets of aluminum, their connection end, intended for connecting said elements to the rail or support, is bent such that it can be press fitted onto flanges comprised in the rails or supports. These flanges are located such that the mentioned connection end is parallel to the ceiling, i.e., in the horizontal position, when the decorative element is in the fixing position. However, the main body of the decorative element must be perpendicular to the ceiling, i.e., in the vertical position, so that it is visible. Due to the fitting system, to prevent gravity or a gust of wind from pulling the decorative element out of the fixing position, the decorative element cannot weigh too much and the surface of the connection end intended for being fitted onto the flanges of the rail or support must be large enough to produce a friction force that makes it hard to extract said decorative element from the rails or supports fixed to the ceiling.

[0005] Due to these geometric limitations, when large surface areas are to be covered, the longitudinal attachment between different decorative elements is done by placing the elements one after the other. To assure that there are no empty gaps between contiguous decorative elements, one element normally even overlaps another, which is not easy to do given how small the space is.

Description of the Invention

[0006] The present invention proposes an alternative solution to the problems considered above by means of a connection system according to claim 1. The dependent claims define preferred embodiments of the invention.

[0007] A first aspect of the invention provides a connection system comprising
at least one support element, and
at least one strip defining a strip connection plane, where the at least one support element comprises one from among first retaining means and second retaining means, and the at least one strip comprises the other from among first retaining means and second retaining means,
the second retaining means comprise a receiving area adapted to receive the first retaining means in the direction of the strip connection plane and thereby obtain a fixing position of the at least one strip, such that when the at least one strip is in said fixing position, the second retaining means impede extracting the strip in a direction contained in the strip connection plane.

[0008] Strip connection plane will be understood as the midplane of the strip portion comprising one from among first retaining means and second retaining means.

[0009] This connection system advantageously allows fixing strips with different profiles, different thicknesses and made from different materials, eliminating the restriction existing in systems comprised in the state of the art.

[0010] In a particular embodiment, the receiving area comprises a straight section oriented according to a direction contained in the strip connection plane, the straight section being intended for housing a straight portion comprised in the first retaining means, and thereby preventing movements of the strip outside the strip connection plane when said strip is in the fixing position.

[0011] Advantageously, this embodiment notably limits movements of the strip outside the strip connection plane due to drafts, accidental impacts with large-sized apparatus, etc.

[0012] In a particular embodiment, the first retaining means comprise a clamping mechanism and the second retaining means comprise at least one stop.

[0013] This particular embodiment advantageously allows fixing the strips by means of introducing the first retaining means in the cavity until the clamping means comprised in the first retaining means are fixed by the stops.

[0014] In a particular embodiment, the second retaining means comprise at least two stops aligned in a direction perpendicular to the strip connection plane.

[0015] In a particular embodiment, the clamping mechanism comprises a harpoon-type tab.

[0016] In a particular embodiment, the connection system comprises at least one support rail where there are comprised two parallel support elements.

[0017] In a particular embodiment, one strip comprises a connection housing and another strip comprises a connection projection adapted to be fixed to the connection housing to obtain a coupling between both strips such that the connection plane of both strips coincides, both strips thereby being aligned.

[0018] This embodiment advantageously allows the attachment of several strips in the strip connection plane, such that a continuous surface is obtained.

[0019] In a particular embodiment, the strips are substantially planar.

[0020] In a particular embodiment, the midplane of each strip substantially coincides with the strip connection plane.

[0021] In a particular embodiment, each support element and each strip are made of a thermoplastic material.

[0022] In a particular embodiment, each support element and each strip are manufactured by means of a thermoplastic material extrusion process.

[0023] All the features and/or steps of methods described in this specification (including the claims, description and drawings) can be combined in any combination, with the exception of those combinations of such features that are mutually exclusive.

Description of the Drawings

[0024] These and other features and advantages of the invention will be better understood from the following detailed description of a preferred embodiment, given only by way of illustrative and non-limiting example in reference to the attached drawings.

Figure 1 shows a particular embodiment of a connection system according to the invention.

Figure 2 shows an enlarged view of the area of connection between a strip and a support element of a connection system according to the invention.

Figure 3 shows a profile view of a detail of a connection system according to the invention, in which the strip is still not in the fixing position.

Figure 4 shows a particular example of a connection system according to the invention.

Figure 5 shows both a profile view and a perspective view of a particular example of the support rail comprising two support elements.

Detailed Description of the Invention

[0025] Figure 1 shows a particular embodiment of a connection system according to the invention. This connection system comprises
two support rails (11), each comprising two support elements (1), one for each face of the support rail (11), and a strip (3) defining a strip connection plane (P).

[0026] In other particular embodiments, placing a support element (1), for example at the midpoint of the two support rails (11) seen in Figure 1, is sufficient.

[0027] Each support element (1) comprised in the support rail (11) comprises in this case second retaining means, and each strip (3) comprises first retaining means. It is obvious that this can be the other way around in other embodiments of the invention, and the first retaining means can be comprised in the support elements (1) and the second retaining means in the strips (3).

[0028] As defined above, the strip connection plane (P) is defined as the midplane of the strip portion comprising one from among first retaining means and second retaining means. In this case, the strip (3) comprises the first retaining means, so the strip connection plane (P) is defined as the midplane of the strip portion comprising the first retaining means.

[0029] In this figure, the strip connection plane (P) coincides with the midplane of the strip, since the strip is substantially planar. Nevertheless, in particular embodiments the strip follows a path differing from said strip connection plane.

[0030] Figure 2 shows an enlarged view of the area of connection between a strip (3) and a support element (1). It can be seen how the second retaining means, which in this particular example are comprised in the support elements (1), comprise a receiving area (4) adapted to receive the first retaining means in the direction of the strip connection plane (P) and thereby obtain a fixing position of the at least one strip (3), such that when the at least one strip (3) is in said fixing position, the second retaining means impede extracting the strip (3) in a direction contained in the strip connection plane (P).

[0031] Figure 3 shows a side view of a detail of a connection system according to the invention, in which the strip (3) is still not in the fixing position. This view allows seeing how, in this embodiment, the receiving area (4) comprises a straight section (5) oriented according to a direction contained in the strip connection plane (P), the straight section being intended for housing a straight portion (6) comprised in the first retaining means, which in this case are comprised in the strip (3), and thereby preventing movements of the strip (3) outside the strip connection plane (P) when said strip (3) is in the fixing position.

[0032] Furthermore, said figure also shows two stops (8) comprised in the second retaining means which, in this embodiment, are comprised in the support element (1) and aligned in a direction (N) perpendicular to the strip connection plane (P).

[0033] The clamping mechanism comprises a harpoon-type tab (7) to cooperate with this configuration of the second retaining means.

[0034] Figure 4 shows a particular example of a connection system according to the invention, which shows how one of the strips comprises a connection housing (9) and another strip (3), which is located contiguous thereto, comprises a connection projection (10) adapted to be fixed to the connection housing (9) to obtain a coupling between both strips (3). The configuration thereby obtained comprises two strips attached such that the connection plane of both strips coincides, both strips thereby being aligned. Mechanical continuity which is not altered by external circumstances affecting any of the strips is thereby assured, since both strips remain integral to one another when subjected to loads having components perpendicular to the connection plane in either one direction or the other.

[0035] Figure 5 shows both a side view and a perspective view of an embodiment of the support rail (11) comprising two support elements (1). This support rail can be anchored to ceilings or walls, and each of the support

elements (1) comprised in it comprises a plurality of second receiving means.

Claims

1. A connection system comprising
at least one support element (1), and
at least one strip (3) defining a strip connection plane (P),
where
the at least one support element (1) comprises one from among first retaining means and second retaining means, and the at least one strip (3) comprises the other from among first retaining means and second retaining means,
the second retaining means comprise a receiving area (4) adapted to receive the first retaining means in the direction of the strip connection plane (P) and thereby obtain a fixing position of the at least one strip (3), such that when the at least one strip (3) is in said fixing position, the second retaining means impede extracting the strip (3) in a direction contained in the strip connection plane (P).

2. The connection system (1) according to claim 1, wherein the receiving area (4) comprises a straight section (5) oriented according to a direction contained in the strip connection plane (P), the straight section (5) being intended for housing a straight portion (6) comprised in the first retaining means, and thereby preventing movements of the strip (3) outside the strip connection plane (P) when said strip (3) is in the fixing position.

3. The connection system (1) according to claim 1, wherein the first retaining means comprise a clamping mechanism and the second retaining means comprise at least one stop (8).

4. The connection system (1) according to claim 3, wherein the second retaining means comprise at least two stops (8) aligned in a direction perpendicular to the strip connection plane (P).

5. The connection system (1) according to any of claims 3 or 4, wherein the clamping mechanism comprises a harpoon-type tab (7).

6. The connection system (1) according to any of the preceding claims, comprising at least one support rail (11) where two parallel support elements (1) are comprised.

7. The connection system (1) according to any of the preceding claims, wherein a strip (3) comprises a connection housing (9) and another strip (3) comprises a connection projection (10) adapted to be fixed to the connection housing (9) to obtain a coupling between both strips (3) such that the connection plane of both strips coincides, both strips thereby being aligned.

8. The connection system (1) according to any of the preceding claims, wherein the strips (3) are substantially planar.

9. The connection system (1) according to the preceding claim, wherein the midplane of each strip (3) substantially coincides with the strip connection plane (P).

10. The connection system (1) according to any of the preceding claims, wherein each support element (1) and each strip (3) are made of a thermoplastic material.

11. The connection system (1) according to any of the preceding claims, wherein each support element (1) and each strip (3) are manufactured by means of a thermoplastic material extrusion process.

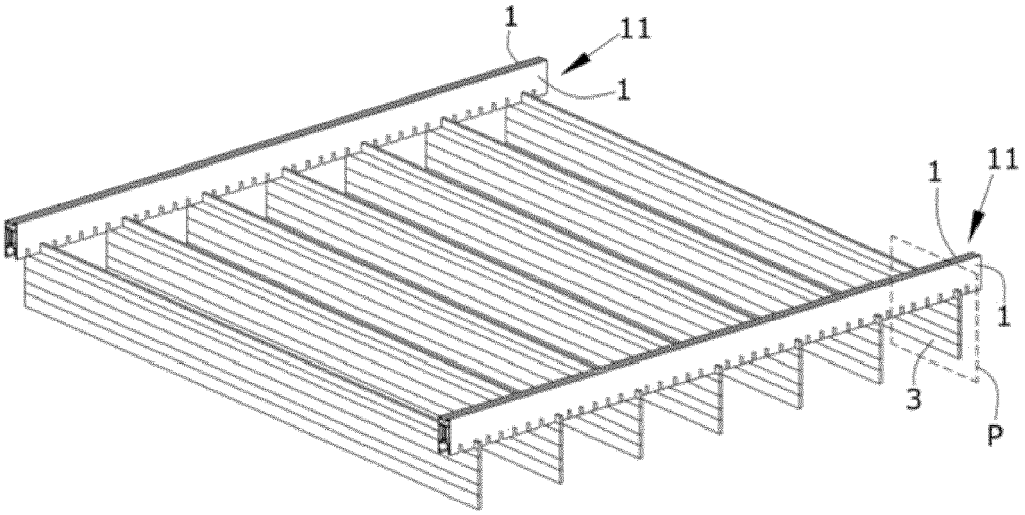

FIG.1

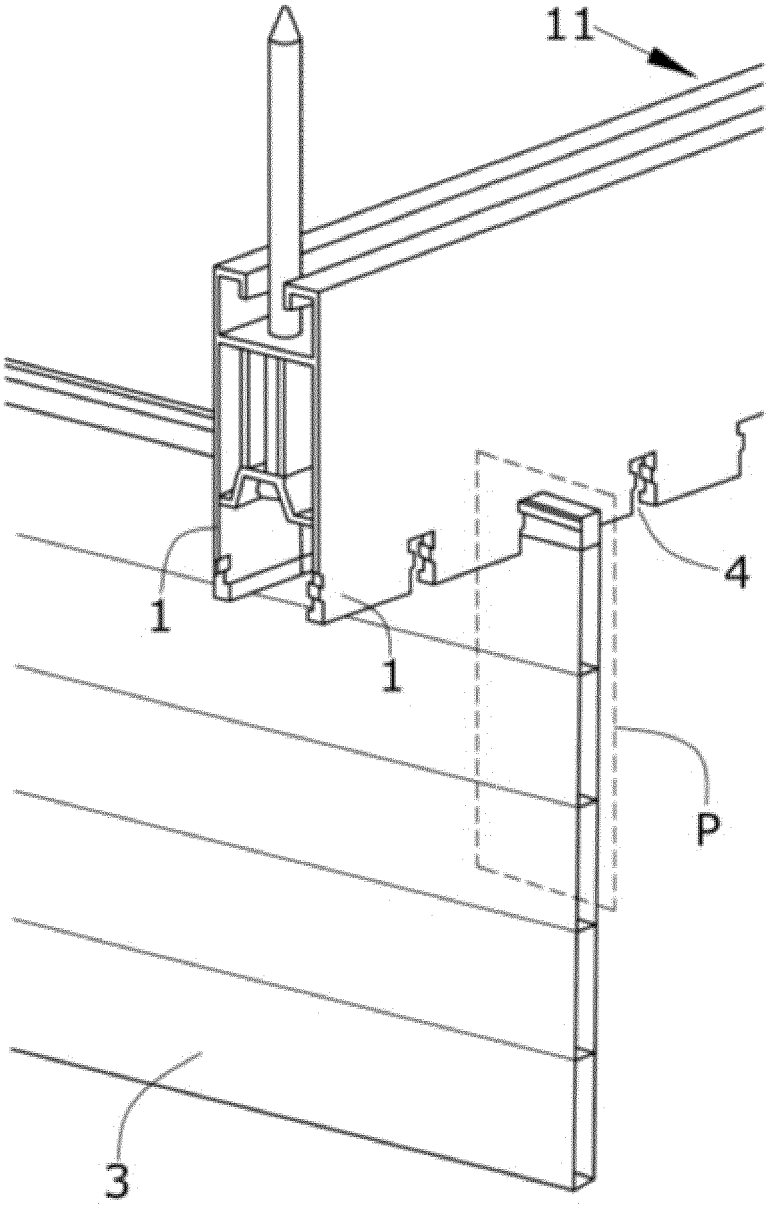

FIG.2

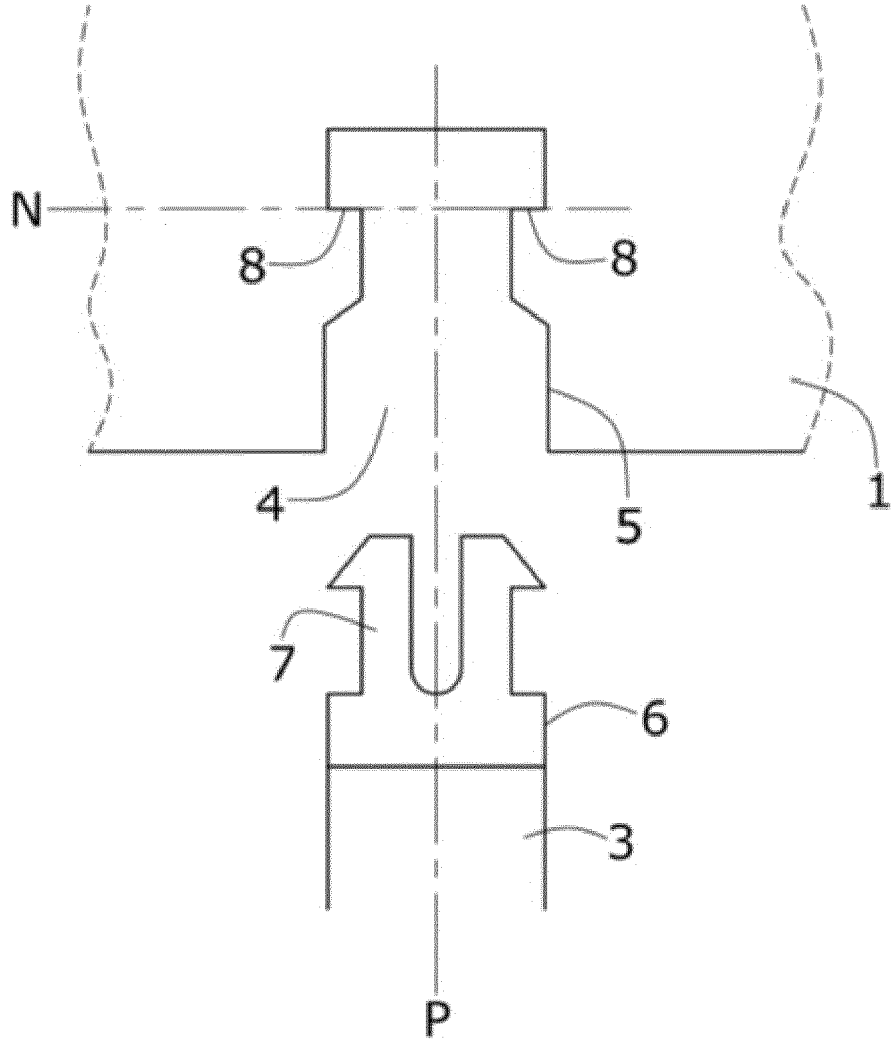

FIG.3

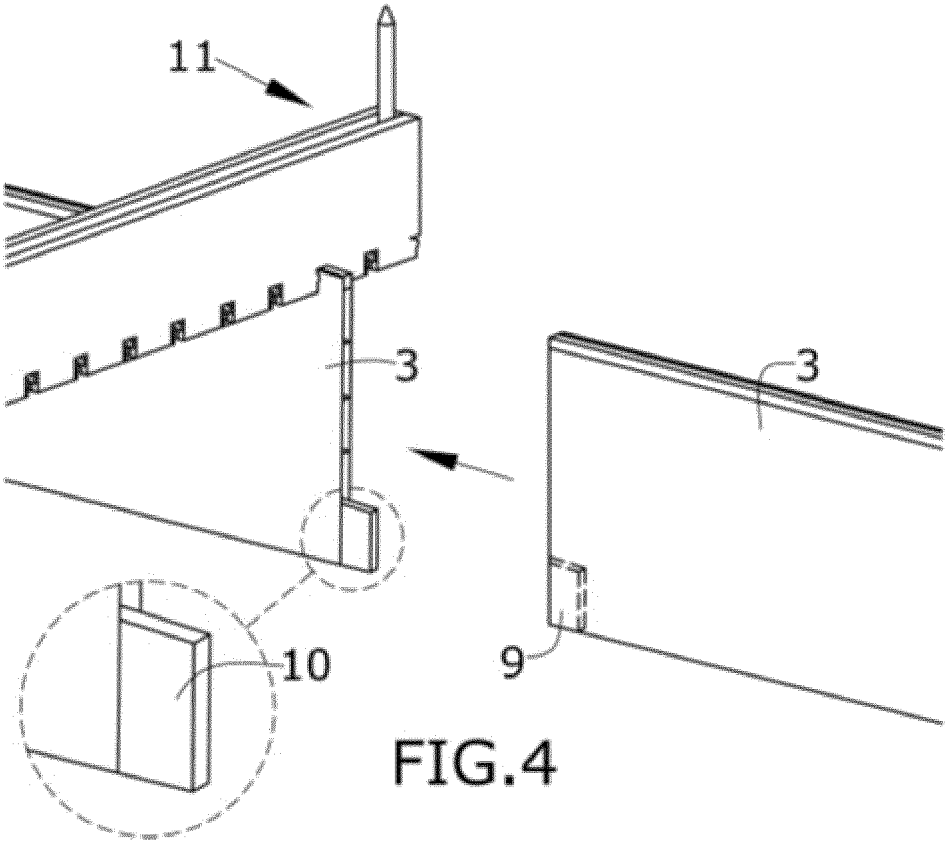

FIG.4

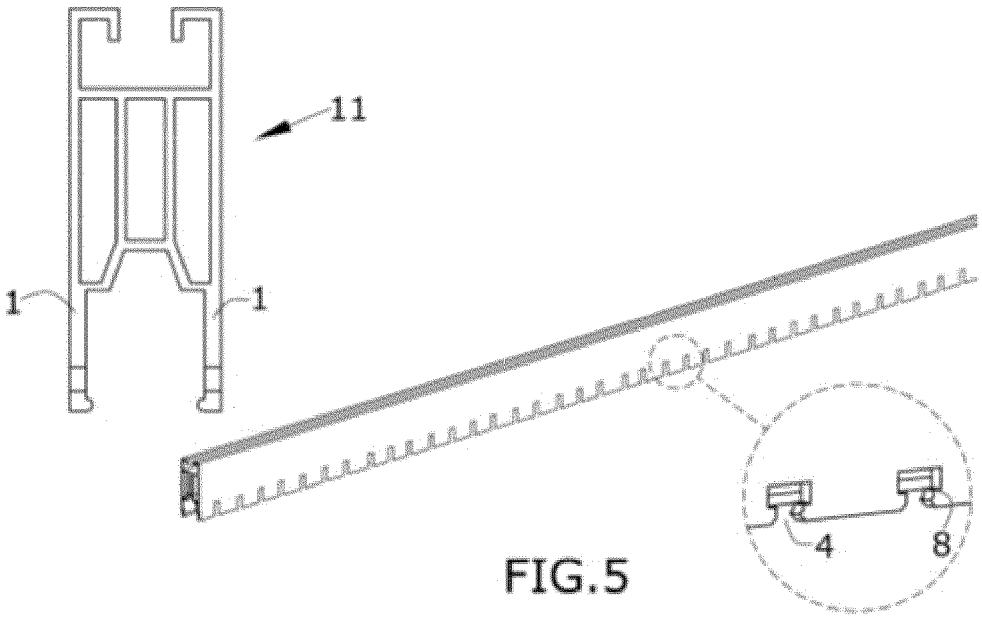

FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 15 38 2146

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

E04B
E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 September 2015	Bauer, Josef

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 38 2146

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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08-09-2015

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