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(54) **Attachment device with acoustic isolation for use in building constructions**

(57) The present invention is related to an attachment device for interconnecting a supporting structure of a building and a wall or panel facing said supporting structure, the device comprising three elements, the first being attachable to the supporting structure, the second being a damping element, and the third being attachable to the exterior wall. The damping element is formed of a resilient material, and is arranged to connect the other two elements

without said two elements making direct contact, so that an acoustic and vibrational decoupling is obtained. In each embodiment, the first element is shaped so as to form an area for receiving the second element by inserting the second element into said area, without necessitating further mechanical attachment means. Likewise, the damping element comprises a receiving area (preferably a hole), for receiving the third element without the help of further mechanical attachment means.

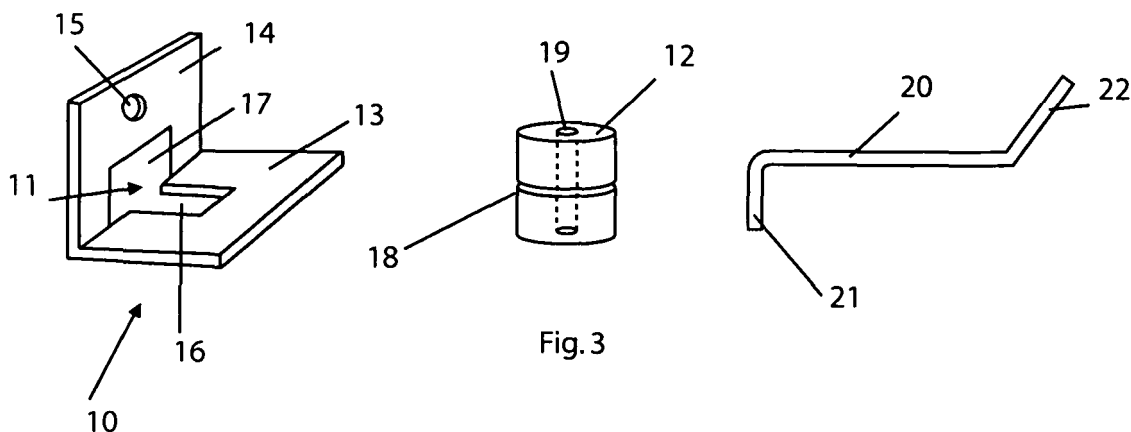


Fig. 3

## Description

### Field of the invention

[0001] The present invention is related to the field of construction, in particular to the acoustic isolation of the connection between members of a double-leaf structure, said members being a supporting structure and a wall or panel facing said structure (e.g. an exterior wall, interior wall or ceiling panel), and to an attachment device for realising such a connection.

### State of the art

[0002] The problem of acoustics in buildings, caused by the transmission of vibrations in structures are well known in the field of construction. In particular, an internal or external wall or panel located in front of, i.e. facing a supporting structure, must be attached, for reasons of stability, to the supporting structure by attachment devices. These devices are however liable to transmit vibrations from the facing wall or panel to the structure, and thereby transmit noise to the rest of the building. A known solution to this problem is the use of special devices comprising a less rigid damping material, which is arranged to prohibit the transmission of vibration, whilst the device maintains its function of taking up tensile and compressive forces, to thereby ensure the stability of the wall.

[0003] A first known device is shown in figure 1. It concerns an attachment device divided in two parts 2 and 3, wherein the continuity is ensured by a damping material 1, in which the outer ends of the two parts are embedded. Functionally, this device is quite effective, but it is difficult and expensive to realise the connection between the two parts and the damping material during production of the device.

[0004] One way of obviating the abovenamed problem is to realise the device by an assembling technique. Figure 2 shows an example. The damping material is divided in two parts 1a and 1b, which are mechanically attached to a support bracket 4, by the hook 5, which is equipped with assembling means 6. Even though this device is less complex, installation of this device is time consuming and difficult.

### Aims of the invention

[0005] The present invention aims to provide an attachment device which is simple, while offering the required characteristics in terms of mechanical and acoustical performance, without necessitating a complex installation, and without representing an important production cost.

### Summary of the invention

[0006] The invention is related to devices as described in the appended claims. Various embodiments are de-

scribed in the dependent claims. The characteristic elements of the invention are the following : it concerns an attachment device equipped with an acoustic isolation, arranged to interconnect the members of a double leaf structure in a building, said members being a supporting structure and a wall or panel facing said supporting structure, the attachment device being composed of several elements which are assembled by fitting the elements together, and without using further mechanical connection means. The invention is not limited by any form or shape of the constituting elements of the attachment device.

[0007] In particular, the device comprises three elements, the first being attachable to the supporting structure, the second being a damping element, and the third being attachable to the facing wall or panel. The damping element is formed of a resilient material, and is arranged to connect the other two elements without said two elements making direct contact, so that an acoustic and vibrational decoupling is obtained. In each embodiment, the first element is shaped so as to form an area for receiving the second element by inserting the second element into said area, without necessitating further mechanical attachment means. Likewise, the damping element comprises a receiving area (preferably a hole), for receiving the third element without the help of further mechanical attachment means.

### Brief description of the drawings

[0008] Figures 1 and 2 illustrate attachment devices as known in the art.

[0009] Figure 3 illustrates an attachment device according to a first embodiment of the invention.

[0010] Figure 4 illustrates an attachment device according to a second embodiment of the invention.

[0011] Figure 5 illustrates an attachment device according to a third embodiment of the invention.

### Detailed description of the invention

[0012] The attachment device of the invention is realised by three different elements, the first one being a support bracket which is to be fixed to the supporting structure, the second one being an element formed of a damping material, and the third one being preferably a hook or flat profile, to be fixed to the facing wall or panel. The basic characteristic of the invention lies in the fact of being able to realise the assembled device with the help of constituting elements, especially designed to be assembled without difficulty, by simply fitting elements together. This characteristic allows a considerable cost reduction.

[0013] Figure 3 shows the constituting elements of a first embodiment of the invention. The first element (bracket 10) is provided with an opening 11, so that the damping element 12 may be fitted into said opening (from the left as seen on the drawing). The bracket 10 is ar-

ranged to be fixed to the supporting structure and automatically blocks the damping element. Bracket 10 is preferably produced as a plate-shaped element, which is bent at an essentially right angle, to obtain a flat subpart 13 and an upright sub-part 14. A hole 15 may be provided in the upright sub-part, for attaching the element to the supporting structure. The central opening 11 comprises a first portion 16 situated in the flat subpart 13 and a second portion 17 in the up-right sub-part 14. The width of portion 16 is smaller than the width of portion 17. The damping element 12 is provided as a cylindrical element with a central section 18 having a reduced diameter. The difference in width between the opening portions 16 and 17 in bracket 10 is such that the damping element may be inserted through the up-right opening portion 17, so that the section 18 with reduced diameter fits over the sides of the flat opening portion 16, and is thereby secured. No other mechanical connection is required between the bracket 10 and the damping element 12. The damping element 12 is provided with a central hole 19, which is arranged to receive an outer end 21 of the hook element 20 without a direct contact occurring between the hook 20 and the bracket 10. The second outer end 22 of the hook 20 is fixed to, e.g. embedded in, the facing wall (not shown).

**[0014]** Figure 4 shows a second embodiment according to the invention. The first element is a bracket 30 shaped so that the damping material is fitted into this bracket by gliding from the side. According to this embodiment, bracket 30 is provided as a plate-shaped element, one end of which is arranged to be fixed to a supporting structure (e.g. through hole 31), and which is bent at an essentially right angle at three different locations 32, 33 and 34, so as to form a rectangular-shaped area 50 (partially delineated by the dotted lines), each side of the rectangle being taken up at least partially by plate material. The damping element 35 can be inserted into said rectangular-shaped area from the side, and is shaped in a corresponding rectangular shape so as to be secured in the area 50, without requiring additional mechanical connection means. At the end opposite the end which is fixed to the supporting structure, an additional opening 36 may be provided to facilitate access to the damping element 35. The third element of the attachment device is a flat profile 37, provided with a pin 38, which can be fitted into the damping element 35. This damping element is provided with a hole 39 for receiving the pin 38. The third element may be provided in another shape as well, e.g. a hook element as shown in figure 3.

**[0015]** Figure 5 shows a third embodiment according to the invention. In this embodiment, the first element is a bracket 40 to be fixed to the supporting structure, and shaped so that the damping material 41 is fitted onto said element by a clip 42. For this purpose, the bracket comprises a rigid portion 43 which is to be fixed to the supporting structure, and a flexible clip portion 42. The clip portion may be a piece of plate material shaped in a cylindrical form, to form an inner cavity 60, and comprising

rounded ends 44 at the extremities. The plate material is flexible in that the rounded ends are pushed sideways when a cylindrical element with sufficient rigidity is pushed between the ends (from right to left on the drawing). This role is played by the damping element 41 which is formed as a cylindrical element with a size adapted to the size of the clip portion. By pushing the damping element between the rounded ends, it may be secured in the receiving area 60 of the bracket 40. The damping element comprises a central hole 45, in which the third element, e.g. a hook or a flat profile or another type of fixation element, may be fitted, to form the attachment device of the invention.

**[0016]** As is seen from the previous description, different forms of the invention are possible, wherein the principle remains that constituting elements are fitted together by gliding, clip action, pins or the like.

## Claims

1. Attachment device for interconnecting a supporting structure of a building and a wall or panel facing said supporting structure, said device comprising three elements :

- a first element (10,30,40) arranged to be fixed to said supporting structure,
- a second element (12,35,41) formed of a vibration damping material, the second element being attached to the first element,
- a third element (20,37) arranged to be fixed to said facing wall or panel, the third element being attached to the second element,
- the second element being arranged so that no direct contact occurs between the first and third element,

**characterized in that** the first element is provided with an area (11,50,60) for receiving therein the second element by insertion of the second element into said area, without using any further mechanical attachment means to secure the second element to the first element, and wherein the second element is provided with an area (19,39,45) for receiving therein the third element, without making use of any further mechanical attachment means to secure the third element to the second element.

2. Attachment device according to claim 1, wherein the first element is a bracket (10) formed of a plate-shaped material bent at an essentially right angle to form a flat part (13) and an upright part (14), and having a central opening (11), a first portion (16) of said opening being situated in the flat part (13), and a second portion (17) of said opening being situated in the upright part (14), the width of the first portion (16) being smaller than the width of the second por-

tion (17), and wherein the second element (12) is provided with a central section (18) with reduced diameter, said central section being arranged to fit between the edges of the first portion (16) of the opening (11), and wherein the second element (12) further comprises a hole (19) for receiving the third element (20) therein. 5

3. Attachment device according to claim 2, wherein said second element (12) is a cylinder-shaped element and wherein said hole (19) is placed centrally along the axis of said cylinder-shaped element. 10

4. Attachment device according to claim 1, wherein the first element is a bracket (30) formed of a plate-shaped material, bent at an essentially right angle at three locations (32,33,34), so as to form an essentially rectangular area (50) surrounded at least partially on four sides by plate material, and wherein the second element (35) is shaped so as to fit into said area, and wherein said second element comprises a hole (39) for receiving the third element (37) therein. 15 20

5. Attachment device according to claim 1, wherein the first element is a bracket (40) comprising a clip portion (42), and wherein the second element (41) is a cylinder shaped element dimensioned so as to fit into said clip portion, and wherein the second element (41) comprises a hole (45) for receiving the third element therein. 25 30

6. Attachment device according to any one of the preceding claims, wherein said third element is a hook-shaped element (20), wherein a first end (21) of said hookshaped element is inserted in said receiving area of the second element. 35

7. Attachment device according to any one of claims 1 to 5, wherein said third element is a flat profile (37), comprising a pin (38), said pin being inserted in the receiving area of the second element. 40

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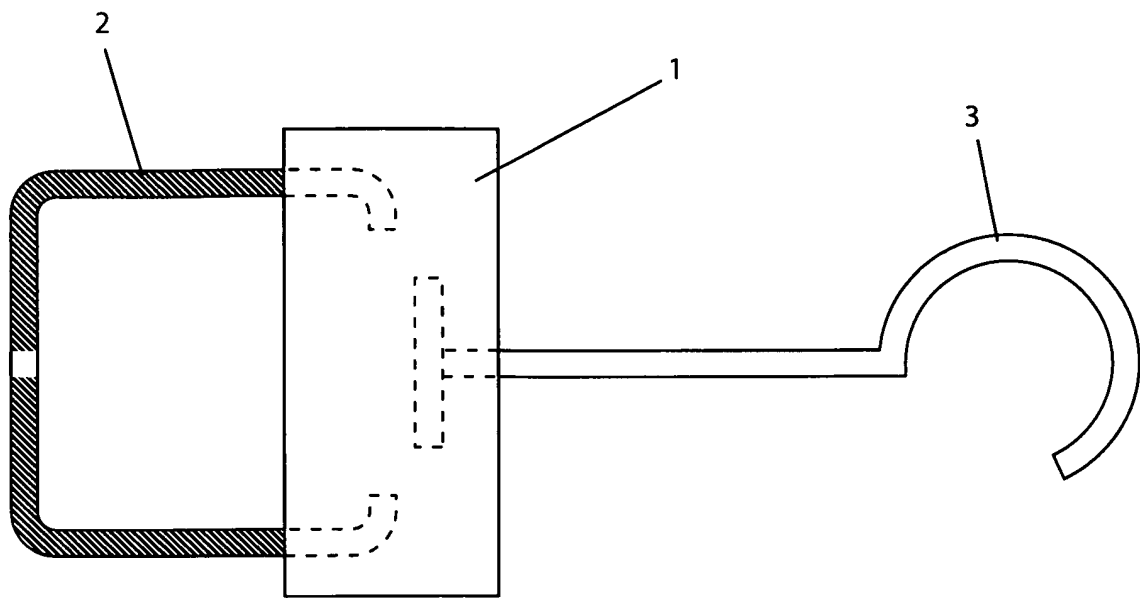


Fig. 1

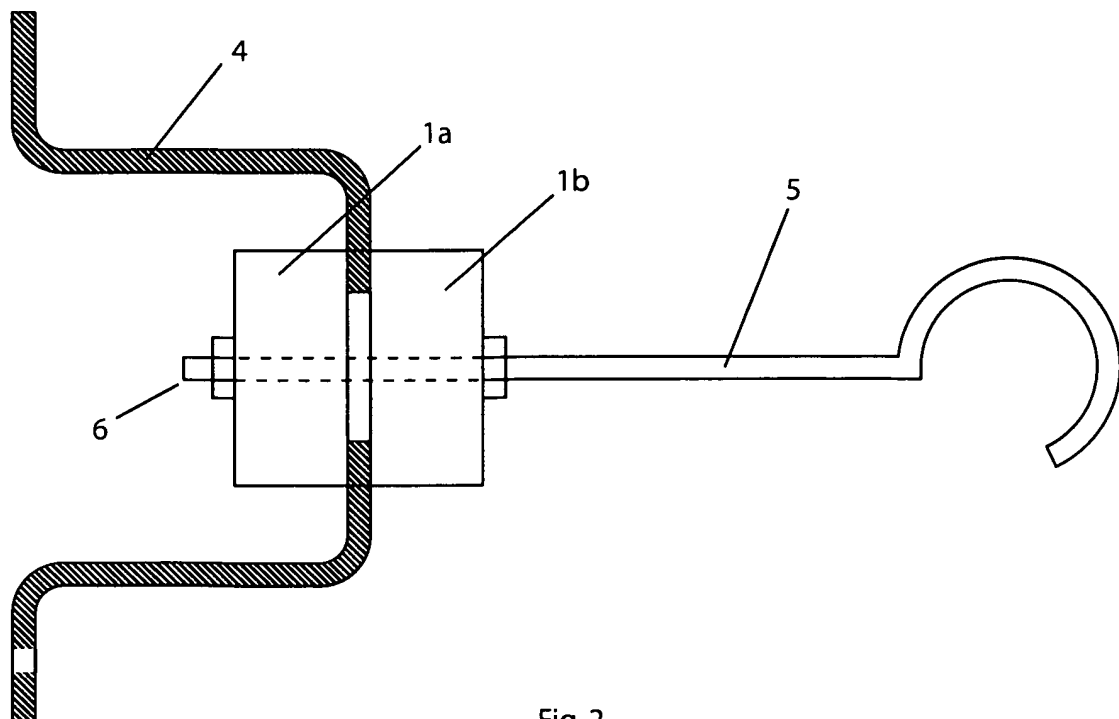


Fig. 2

