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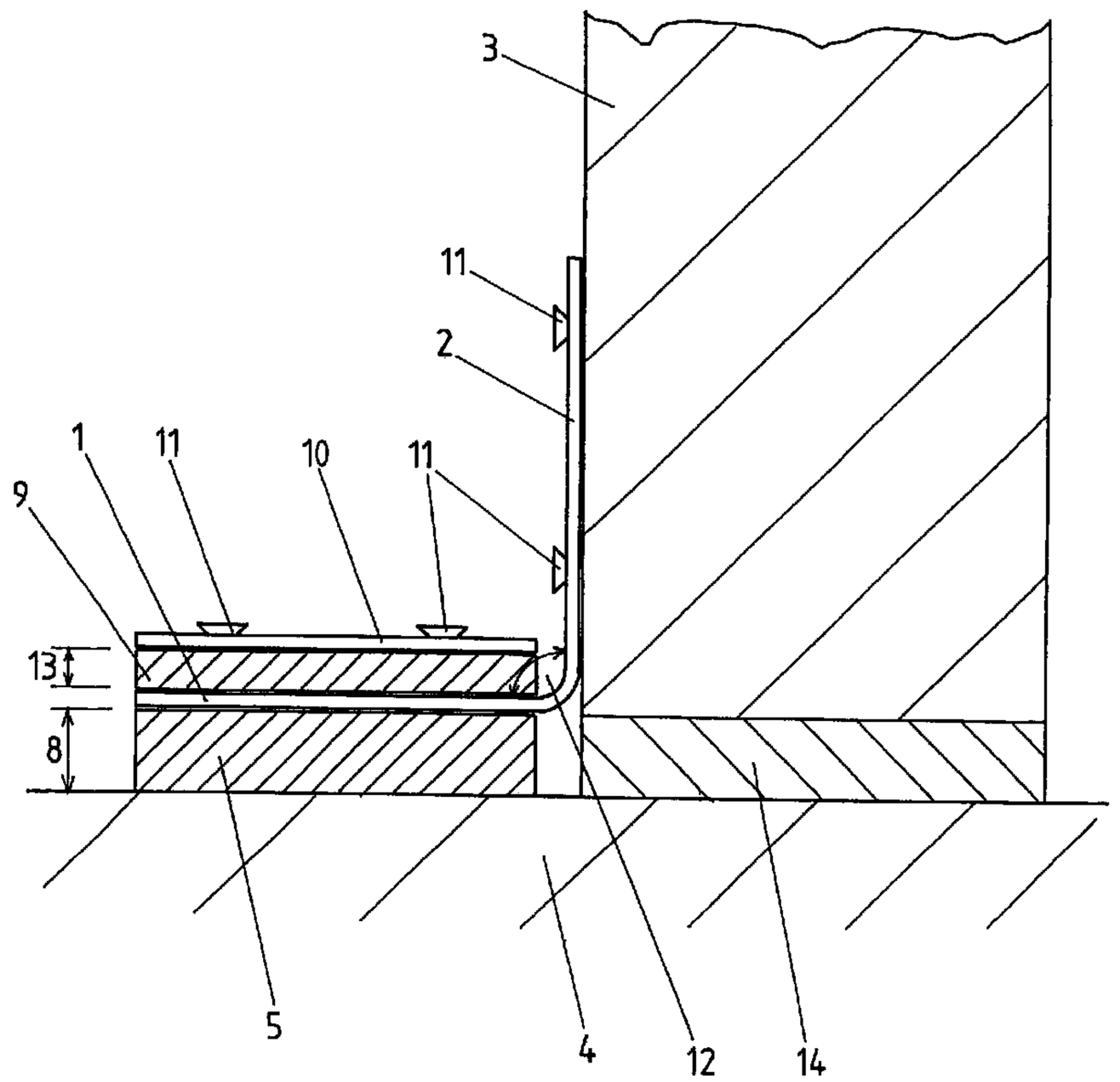

(57) Abrégé/Abstract:
An angled connector having at least two legs (1, 2) arranged at an angle in reference to each other deviating from 0° and 180° for mounting a first part (3) to a second part (4). The connector has at least at one leg (1) and at least one intermediate layer (5) is provided made from a sound-dampening or vibration insulating material.

ABSTRACT

An angled connector having at least two legs (1, 2) arranged at an angle in reference to each other deviating from 0° and 180° for mounting a first part (3) to a second part (4). The connector has at least at one leg (1) and at least one intermediate layer (5) is provided made from a sound-dampening or vibration insulating material.

ANGLED CONNECTOR

The present invention relates to an angled connector with at least two legs, arranged at an angle deviating from 0° and 180°, for mounting one part to another part.

Generic angled connectors are used e.g., in construction, particularly wood construction and/or building construction, but also in other fields, such as machine construction. According to prior art, one of the legs of the angled connector is mounted to one of the parts and the other leg to the other part, which leads to both parts being fixed in reference to each other at an angle predetermined by the angled connector. Here, the legs are directly mounted to the parts, e.g., by screwing, which however particularly enhances the transfer of sound, especially in buildings.

The object of the invention is to further develop a generic angled connector such that this problem is eliminated or at least reduced.

According to the invention this is achieved in that at least on one of the legs at least one intermediate later is arranged comprising a sound absorbing or vibration insulating material.

According to the invention, there is provided an angled connector comprising at least first and second legs, arranged at an angle in reference to each other deviating from 0° and 180°, for mounting a first part to a second part, at least one intermediate layer being arranged at least on one of the legs, said at least one intermediate layer comprising a sound-absorbing or vibration-insulating material, wherein an additional intermediate layer comprising a sound-absorbing or vibration-insulating material is arranged on a side of said at least one

of the legs opposite the intermediate layer so that fastening elements to mount said at least one of the legs to one of the first part and the second part essentially contact said at least one of the legs exclusively via the additional intermediate layer and the intermediate layer, wherein one or more support plates are arranged on a side of the additional intermediate layer opposite said at least one of the legs, by which heads of the fastening elements are supportable, wherein mounting holes are provided in said at least one of the legs through which the fastening elements are passable, characterized in that the additional intermediate layer is arranged at least in proximity to the mounting holes.

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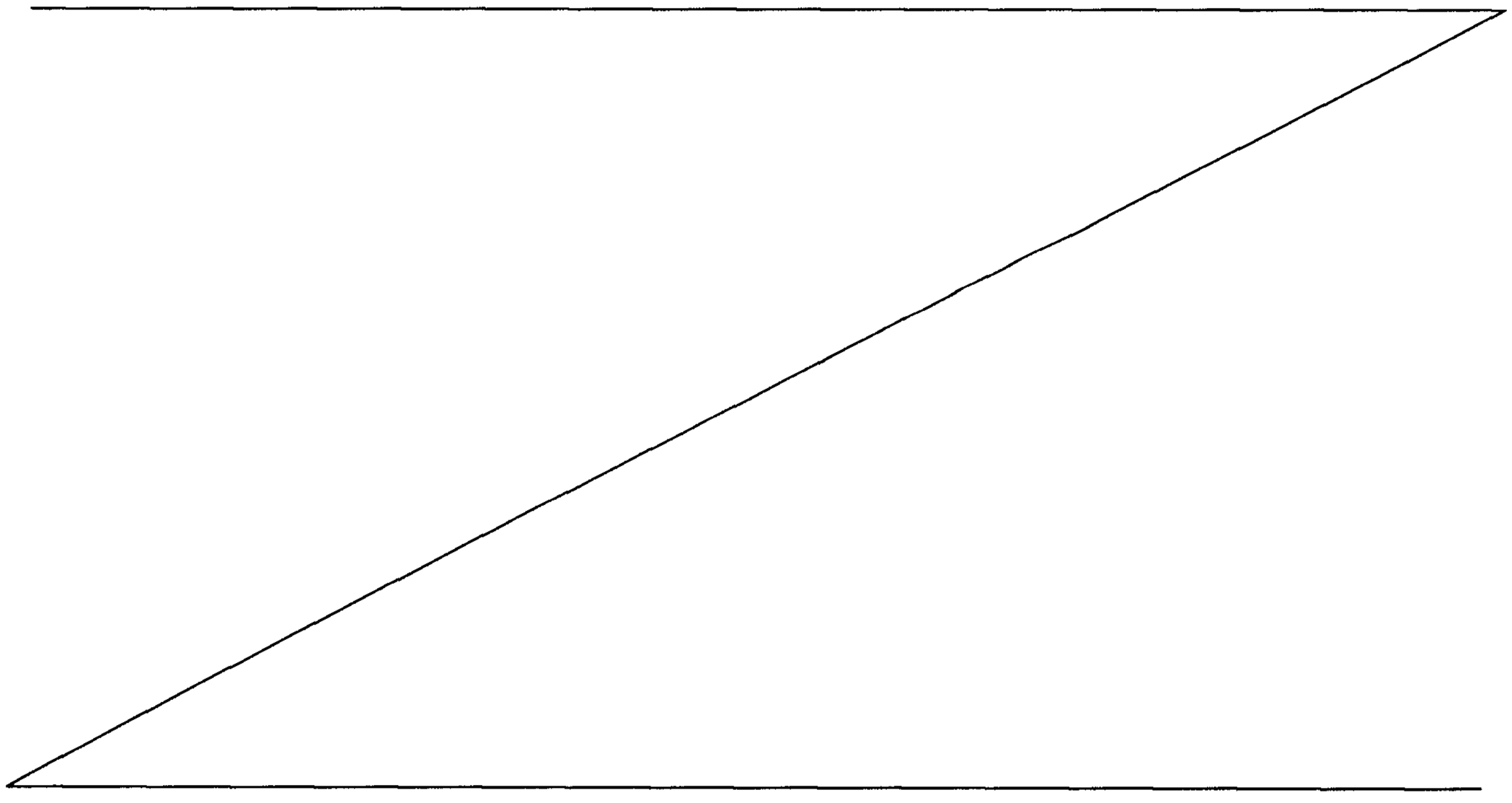
The material of the intermediate layer can be both sound absorbing and vibration insulating as well.

By the interposition of the intermediate layer made from a sound absorbing and/or vibration insulating material between at least one of the legs and one of the parts it is avoided at least to a large extent that impact sound is transferred from one part to the other part via the angled connector. Here, it can be provided that one



appropriate intermediate layer is provided between each of the two legs and the respective parts to be mounted thereto. In general, one intermediate layer at one of the legs is sufficient, though. Sound dampening and/or vibration insulating material usually represents material provided with better characteristics with regard to sound absorption and/or vibration insulation than the legs of the angled connectors, which usually are made from metal, preferably steel.

Beneficially, an elastomer is used as the sound absorbing and/or vibration insulating material for the intermediate layer. The intermediate layer can here be entirely made from this material or comprise additional materials as well. Beneficially, the intermediate layer has a static elasticity module ranging from 0.025 N/mm^2 (Newton per square millimeter) to 5 N/mm^2 and/or a dynamic elasticity module ranging from 0.025 N/mm^2 to 15 N/mm^2. Preferably the material is used in a compression range from 0.005 N/mm^2 to 1 N/mm^2. Furthermore, it is beneficial if the intermediate layer has a minimum thickness of at least 0.4 cm, preferably at least 0.6 cm. Preferably, the thickness ranges from 6 mm to 12 mm, however, any other thickness is possible. Particularly preferred elastomers are preferably foamed polyurethane-elastomers, rubber-elastomers, or also thermo-plastic elastomers.

Additional details and features are explained using an exemplary embodiment according to the invention.

The drawings show:

Fig. 1 is a perspective view of an exemplary embodiment of the invention

Fig. 2 is an exploded perspective view of the exemplary embodiment of Fig. 1, and

Fig. 3 is a side elevational view of a typical installation using the exemplary embodiment of the invention according to Figs. 1 and 2.

The angled connector according to the invention in the exemplary embodiment shown is essentially provided with legs 1 and 2 arranged orthogonally in reference to each other. This means that an angle 12 amounting to 90° +/- 5° exists between the legs 1 and 2. This is the most frequently used embodiment of angled connectors. They are always used when two parts 3 and 4 shall be mounted to each other at an essentially 90° angle, as shown in Figure 3. Deviating from the exemplary embodiment shown, any other angle ranging from 0° to 180° between the legs 1 and 2 is also possible, depending on the angle the parts 3 and 4 are to be mounted in reference to each other. Preferably it is provided that the respective angle 12 is fixed, thus the two legs 1 and 2 are not pivotal in reference to each other. Deviating therefrom it is also possible to embody the angled connector according to the invention with an angle variable with regard to the legs 1 and 2, e.g., in the form of a hinge.

In the embodiment shown, screws are provided as fastening elements 6, by which the leg 1 can be mounted to the part 4 and the leg 2 to the part 3. The screws 6 are guided through mounting holes 7 of the legs 2. The support head 11, embodied here in the form of a screw head, has a diameter respectively larger than the mounting hole 7 and thus ensures a secure connection.

Of course, as an alternative to the screws shown here other fastening elements known from prior art can be used, such as nails, rivets, bolts, adhesives, and the like.

According to the invention, the intermediate layer 5 made from a sound absorbing and/or vibration insulating material is arranged between the leg 1 and the part 4. It reduces the transfer of impact sound from one of the parts 3 or 4 to the other part 3 or 4 via said angled connector. In the exemplary embodiment shown, the intermediate layer 5 extends over the entire side of the leg 1 facing the part 4 in the assembled state. This is not mandatory. It is beneficial, however, when the

intermediate layer 5 is embodied and arranged at the leg 1 such that the leg 1 is exclusively in a physical contact with the part 4 with an interposition of the intermediate layer 5 and provided fastening elements 6, perhaps, when the leg 1 is fastened at the part 4. This prevents a sound bridge from developing, via which the impact sound can be transferred by the angled connector to the part, circumventing the intermediate layer 5. It is therefore beneficial for the leg 1 not to be in any direct contact to the part 4 at any point. It may be provided that at least mounting holes 7 are provided in one leg 1, 2 for fastening elements 6 passing through, preferably screws or nails. Here, the intermediate layer 5 is preferably arranged at least in the proximity of the mounting holes 7. The intermediate layer 5 can therefore also be embodied as an arrangement of sound-absorbing washers, as well. However, other structures with appropriate sound-absorbing features can be provided as intermediate layers 5, e.g., grid-shaped or honeycomb-shaped or frame-like structures.

When the fastening elements 6 are held at the part 4 in dowels, this might already be sufficient to avoid the transfer of impact sound via the fastening elements 6. If this is not the case, an additional intermediate layer 9 may be provided, as in the exemplary embodiment shown, which prevents at least to a large extent that impact sound can be transferred between the parts 3 and 4 via the angled connector and the fastening elements 6. The additional intermediate layer 9 also comprises sound-absorbing and/or vibration insulating material and may be produced from the same material as the intermediate layer 5. Here, it is not mandatory, either, for it to be embodied holohedral as in the exemplary embodiment shown. The additional intermediate layer 9 is to prevent sound impact from being transferred between the leg 1 and the fastening elements 6. This way, grid or honeycomb-shaped or frame or washer-like structures are also possible as additional intermediate layers 9, as long as a direct contact between the fastening elements 6 and the leg 1 can be avoided so that no effective sound bridge develops via the fastening elements 6.

The intermediate layer 5 and the additional intermediate layer 9 are beneficially mounted to the leg 1 in an undetachable manner. For this purpose, a preliminary assembly using the screws 6 may be sufficient, as shown in Fig. 1. However, it may be also provided that the leg 1 is adhered to the intermediate layer 5 and/or the additional intermediate layer 9 or can be cast therebetween. The thickness 8 of the intermediate layer 5 preferably amounts to at least 0.4 cm, particularly preferred to at least 0.6 cm. Beneficially, thicknesses are selected between 6 mm and 12 mm. The same applies to the thickness 13 of the additional intermediate layer 9, with the thickness 13 usually being less than the thickness 8.

A support plate 10 may be provided, as shown in the exemplary embodiment to prevent the support heads 11 of the fastening elements 9 from penetrating the relatively soft material of the additional intermediate layer 9 and thus fail to be held therein appropriately. This may be made from e.g., metal, preferably steel, or alternatively any appropriately hard and/or tough plastic. The mounting holes 7 provided thereat are once more smaller in their diameters than the support heads 11, so that the fastening elements 6 in the appropriately counter-sunk state press the support plate 10 against the additional intermediate layer 9, by which the entire angled connector is fixed tightly on the part 4. In the exemplary embodiment shown, the support plate 10 is once more embodied in one piece. This is not mandatory here, either. Here, too, as an alternative an arrangement of washers or a grid-like structure or the like are possible.

Fig. 3 shows a typical installation situation in which the post 3 is fastened as the first part to a bottom plate 4 as the second part via the angled connector according to the invention. The leg 2 of the angled connector is here directly connected to the first part 3 via the corresponding fastening elements. This part rests on a pad 14, which in turn serves to absorb impact sound, produced from an appropriately sound-absorbing and/or vibration insulating material. By this pad 14 a direct transfer of impact sound is prevented between both parts 3 and 4.

In order to avoid impact sound being transferred via the angled connector, the intermediate layer 5 is provided according to the already discussed exemplary embodiment according to the invention. The additional intermediate layer 9 prevents the transfer of impact sound via the fastening elements 6, by which the leg 1 is fastened at the part 4.

In general, it is possible to provide not only one of the two legs but both legs 1 and 2 with an appropriate intermediate layer 5 and an additional intermediate layer 9 if the particular installation situation renders it necessary to avoid the transfer of sound impact.

List of reference characters:

1	leg
2	leg
3	part
4	part
5	intermediate layer
6	fastening elements
7	mounting holes
8	thickness
9	additional intermediate layer
10	support plate
11	support head
12	angle
13	thickness
14	pad

CLAIMS

1. An angled connector comprising at least first and second legs (1, 2), arranged at an angle in reference to each other deviating from 0° and 180°, for mounting a first part (3) to a second part (4), at least one intermediate layer (5) being arranged at least on one of the legs (1), said at least one intermediate layer (5) comprising a sound-absorbing or vibration-insulating material, wherein an additional intermediate layer (9) comprising a sound-absorbing or vibration-insulating material is arranged on a side of said at least one of the legs (1) opposite the intermediate layer (5) so that fastening elements (6) to mount said at least one of the legs (1) to one of the first part (3) and the second part (4) essentially contact said at least one of the legs (1) exclusively via the additional intermediate layer (9) and the intermediate layer (5),

wherein one or more support plates (10) are arranged on a side of the additional intermediate layer (9) opposite said at least one of the legs (1), by which heads (11) of the fastening elements (6) are supportable, wherein mounting holes (7) are provided in said at least one of the legs (1) through which the fastening elements (6) are passable, characterized in that the additional intermediate layer (9) is arranged at least in proximity to the mounting holes (7).

2. An angled connector according to claim 1, characterized in that the sound-absorbing or vibration-insulating material comprises an elastic material.

3. An angled connector according to claim 1 or 2, characterized in that the legs (1, 2) are arranged essentially orthogonally in reference to each other.

4. An angled connector according one of the claims 1 to 3, characterized in that the intermediate layer (5) is designed and arranged at the first leg (1) so that when the first leg (1) is mounted to the second part (4), the first leg (1) is exclusively in a physical contact with the second part (4) through interposition of the intermediate

layer (5) or through interposition of the intermediate layer (5) and fastening elements (6).

5. An angled connector according to one of the claims 1 to 4, characterized in that at least in one of the legs (1, 2), mounting holes (7) are provided for guiding fastening elements (6), therethrough.

6. An angled connector according to claim 5, wherein the fastening elements (6) are selected from the group comprising screws and nails.

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7. An angled connector according to claim 5, characterized in that the intermediate layer (5) is arranged at least in proximity to the mounting holes (7).

8. An angled connector according to one of the claims 1 to 7, characterized in that the intermediate layer (5) is arranged on an entire side of the first leg (1) facing the second part (4) in an assembled position.

9. An angled connector according to one of the claims 1 to 8, characterized in that the intermediate layer (5) is fastened to the first leg (1) in an undetachable manner.

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10. An angled connector according to claim 9, characterized in that the intermediate layer (5) is fastened to the first first leg (1) in an adhered manner.

11. An angled connector according to one of the claims 1 to 10, characterized in that the legs (1, 2) are made of metal.

12. An angled connector according to claim 11, wherein the metal is steel.

13. An angled connector according to one of the claims 1 to 12, characterized in that the intermediate layer (5) has a minimum thickness (8) of at least 0.4 cm, preferable at least 0.6 cm.

14. An angled connector according to one of the claims 1 to 13, characterized in that the fastening elements (6) are screws or nails.

15. An angled connector according to one of the claims 1 to 14, characterized in that the additional intermediate layer (9) is arranged on the entire side of the first leg (1) opposite the side of the first leg (1) facing the second part (4) in the assembled state.

16. An angled connector according to one of the claims 1 to 15, characterized in that the sound-absorbing or vibration-insulating material comprises an elastic material.

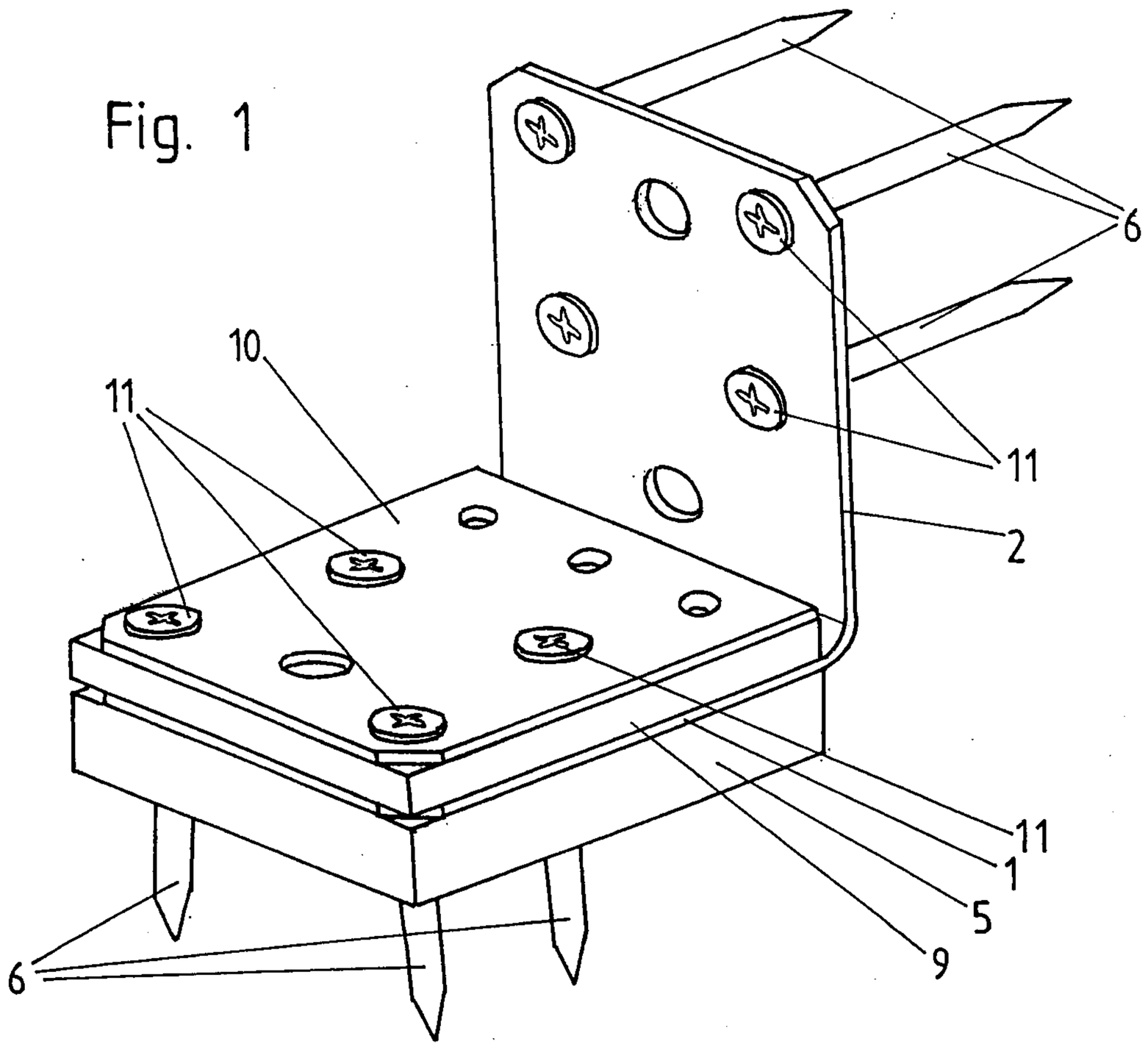
17. An angled connector according to one of the claims 1 to 16, characterized in that the intermediate layer (5) and/or the additional intermediate layer (9) comprise (comprises) a static elasticity module ranging from 0.025 N/mm² to 5 N/mm².

18. An angled connector according to one of the claims 1 to 17, characterized in that the intermediate layer (5) and/or the additional intermediate layer (9) comprise (comprises) an elastomer.

19. An angled connector according to one of the claims 1 to 18, characterized in that the intermediate layer (5) and/or the additional intermediate layer (9) comprise (comprises) a polyurethane-elastomer, or a rubber elastomer, or a thermoplastic elastomer.

20. An angled connector according to claim 19, wherein the polyurethane-elastomer is foamed.

Fig. 1



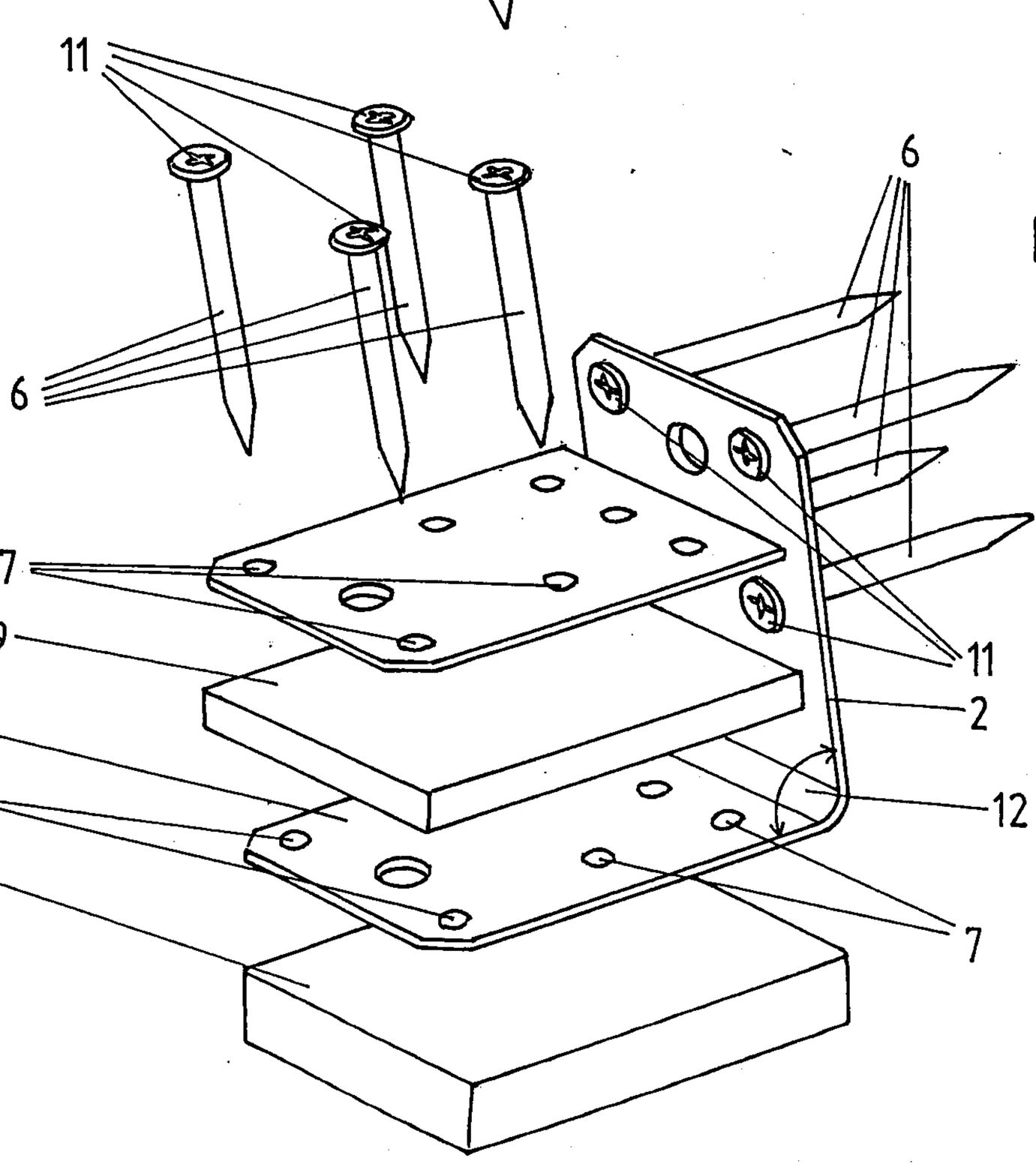
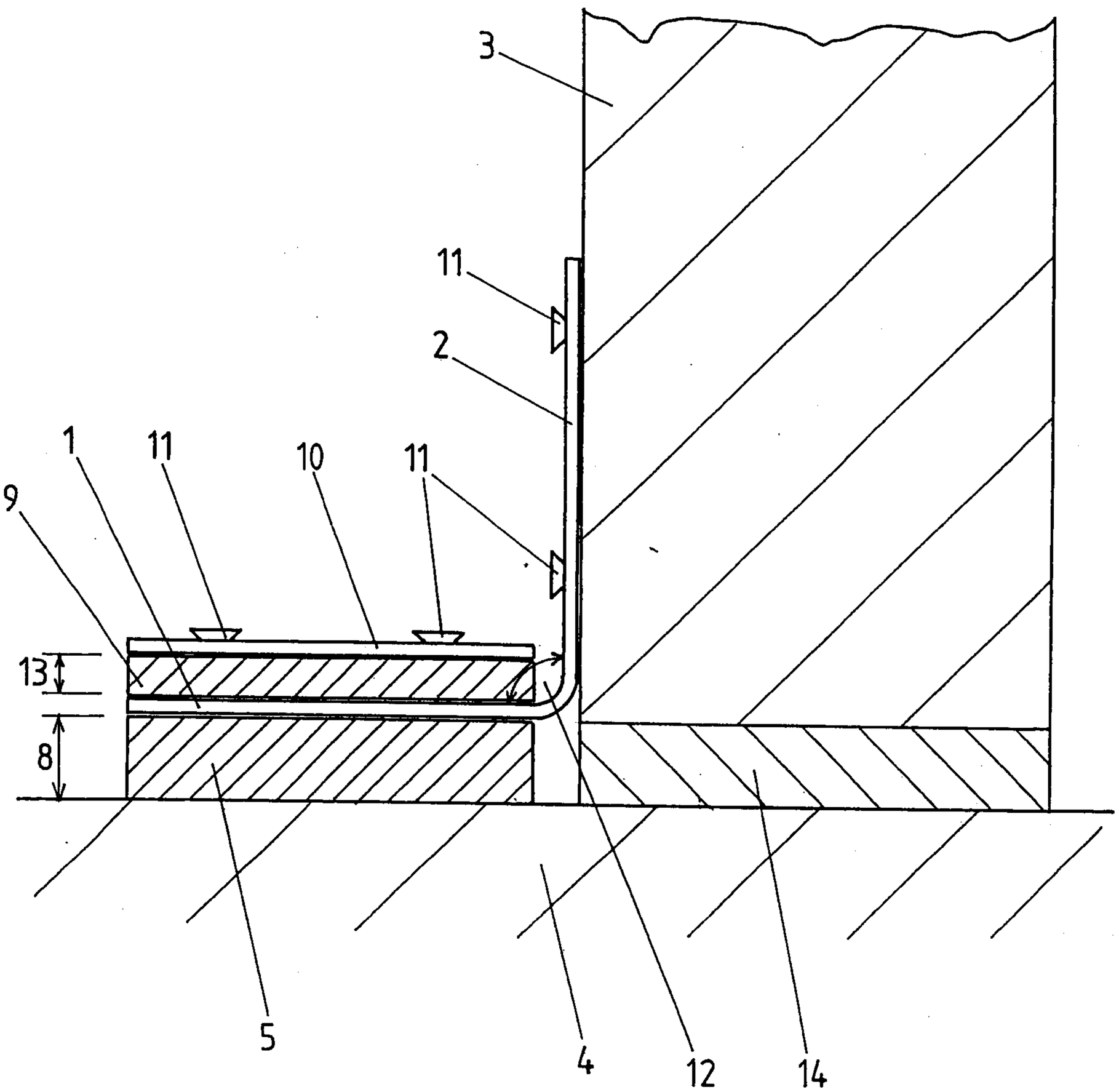
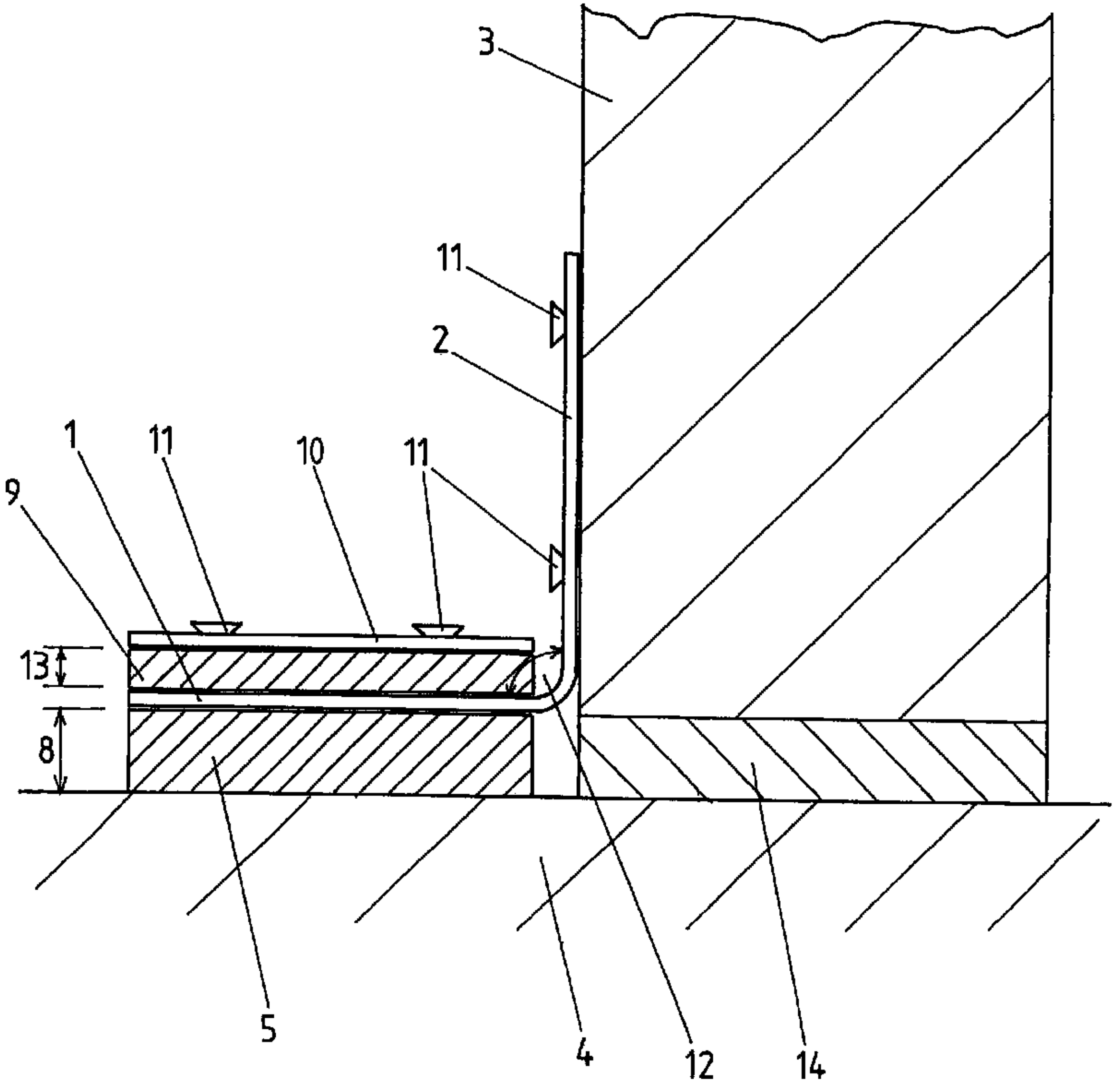


Fig. 2

Fig. 3

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