

Description

[0001] The present invention relates to a device constructed as a section with an I-, H-, [-, □-, T- or L-shaped cross-section, which sections are utilized as supporting elements in the broadest sense for partition walls as so called "Wooden Stud" elements and as supporting element connected with floor slabs, wall plates and roofing sheets, for example, for the wooden frame construction.

[0002] Support sections for building up, for example, partition walls are mostly known as "Metal Stud" profiles, which are used in maximum 5% of new houses under construction in Holland, according to TNO research. TNO is a well-known recognized Dutch research institute for, amongst others, the field of building constructions. From market research it further appears, that in a small market segmentation "Metal Stud"-like partition walls are used very frequently. The market share in Holland seems to amount to approximately EUR 140-180.10⁶ and at a cost price of approximately 40 EUR/m² it yearly concerns approximately 4.10⁶m² "Metal Stud" walls. Here, it concerns non-bearing interior walls. A disadvantage of the "Metal Studs" is, that these are made of thin metal plates and are bent in a [-shape and as a consequence have a very limited resistance against deformation due to torsion. Actually, if not mounted, it is an extremely slack profile, but can be easily cut at length with a scissor. In practice, first a section is fixed to the ceiling, floor and walls and then [-shaped "Metal Stud" sections are placed in between at regular distances, in which the connection is rather weak. Against these relatively slack sections the plates should be screwed on both sides. In practice, the plates are generally gypsum boards or plaster and only after screwing onto the "Metal Stud" sections, a real connection in the partition wall is created, in which making a tight smooth wall is often a problem.

[0003] A further disadvantage of the "Metal Studs" is that the production of steel plate costs a lot of energy (approximately 30 MT/kg) while the "Wooden Studs" for the OSB plate are built up of wood chips with resin and pressed together in layers through which the energy contents seems much less, i.e. the product is much environmentally friendly. Also the delivery and transport of iron ore must be reviewed, while OSB plate material of wood chips can be made of inland wood, through which a very environmentally friendly and durable product is created. Further, the woods grow, so at a well set up forestry program no depletion of natural sources occurs, which is honoured with the FSC hallmark (FSC = forest Stewardship Council).

[0004] In the German "Offenlegungsschrift" DE 198 24596 A1 also a light partition wall (Leichtbauwand) is described, in which also supports in the shape of "Studs" are used. The mentioned supports or posts or "Studs" against which the sheeting (for example gypsum board) should be screwed, exists of a plastic based on wood- or other plastic made from fibre, which are shaped by

means of a stuffing press into profiles with an H- or hollow rectangular cross-section.

[0005] Here, it concerns a stuffing press product that is mainly made of plastic and is therefore relatively slack to make a strong and smooth partition wall, especially at horizontal load.

[0006] The aim of the present invention concerns to provide a very environmentally friendly product in the shape of a "Wooden Stud", of which the above described disadvantages and other non-durable solutions are eliminated as much as possible.

[0007] Further the airborne sound insulation of the partition wall provided with "Metals Studs" and "Wooden Studs" are roughly the same, so that in the sense of building physics we can speak of equality.

[0008] To reach the mentioned aim of the invention a device is constructed as a section with an I-, H-, [-, □-, T- or L-shaped cross-section, built up from strips of board material, which is further developed in a very inventive way, characterized in that the mentioned sections are constructed of strips of board material into the mentioned I-, H-, [-, □-, T- or L-shaped cross-section, in which the interconnection of the mentioned strips of board material is executed by means of moulded patters and glue, in which a minimum thickness D of the board material is required, in which the preferred "Wooden Stud" profile for a partition wall, for example, has the I-shaped cross-section with a flange width B and section height A, in which the board material is preferably manufactured of durable managed forests, in which, for example, the making of the mentioned partition wall on the flanges or outer sides of the mentioned "Wooden Stud" profiles, cover plates of in the market available materials can be applied by means of staples, screws and such and in which insulation material can be applied in between the attached cover plates.

[0009] The advantage is a solid and also against torsion resistable section which retains its form, against which in a fast and supple way, for example, gypsum boards can be stapled or screwed, in which stapling, in practice, generally goes faster than screwing onto the "Metal Stud" walls, through which a production advantage in the construction can be reached and a solid smooth partition wall is created, which also has a very environmentally friendly and durable characteristic. This is of importance for durable construction.

[0010] Further, the device according to the invention is developed in such a way, that the mentioned board material of the body and flanges is an OSB (= Oriented Strand Board) plate material, and that the mentioned connection of the parts by means of moulded patterns and glue exists of a self-gripping tooth connection in, for example, a trapezium or round shape and in which the glue is a plastic adhesive.

[0011] The advantages are a strong plate material, of which the formed moulded pattern makes a strong interconnection between, for example, the flanges and the body of, in this case, the I-shaped profile. This is

reached by connecting the same gripping tooth connection with a strong water-proof plastic adhesive.

[0012] Furthermore, the device according to the invention is further developed in such a way, that the mentioned minimum thickness D of the board material can vary from 6 to 60 mm, preferably for the required plate material OSB a thickness D of approximately 9 mm, in which the preferred I-profile B can be 45 mm and the A values 50, 75 or 100 mm.

[0013] The advantage is a strong, its form retaining "Wooden Stud" section for several wall heights and loads.

[0014] Furthermore, the device according to the invention is further developed in such a way, that for example, for a partition wall construction a U-profile is placed against the ceiling, floor and walls and the posts are preferably of an I-shaped cross-section, in which the body extrudes approx 20 mm from the ceiling and the bottom side can be placed flat on the U-shaped cross-section, and can be locked with a strip of board material, in which on one or both sides the created trellis of sections can be finished with plates, such as, for example, a gypsum board or plywood and such.

[0015] The advantage is a well mountable "Wooden Stud" section in partition walls.

[0016] The preferred construction of the invention will be described by way of example, and with reference to the accompanying drawing.

[0017] In which:

- Fig. 1 shows a preferred embodiment of an I-shaped cross-section of a "Wooden Stud" according to the invention;
- Fig. 2 ditto for a [-shaped cross-section;
- Fig. 3 ditto for a □-shaped cross-section;
- Fig. 4 ditto for a H-shaped cross-section;
- Fig. 5 detailed cross-section of the flange of the I-shaped cross-section of figure 1;
- Fig. 6 detailed cross-section of the body of the I-shaped cross-section of figure 1; and
- Fig. 7 horizontal cross-section of a partition wall with "Wooden Studs" according to the invention.

[0018] Figure 1 shows a preferred embodiment of an I-shaped cross-section 1 of a "Wooden Stud" according to the invention. The I-shaped cross-section 1 consists of two flanges 2 and a body 3, which preferably have a thickness of 9 mm and are made of OSB board material. The connection between the body 3 and the flanges 2 are made by a tooth connection glued together. The precise embodiment of the tooth connection 4 is shown in figures 5 and 6.

[0019] Figure 5 shows the dimensions of the cavity 5 in the flange 2 of the tooth connection 4 and figure 6 shows ditto for the pin or the nose 6 on the body 3 of the tooth connection 4.

[0020] The slope or conicity of the pin 6 and the hole 5 amounts 6 degrees.

[0021] Figure 2 shows a [-shaped cross-section 7 of the "Wooden Stud", in which the body 3 can have the same cross-section and the flanges 8 an adjusted shape.

[0022] Figure 3 shows a □-shaped cross section 9 of the "Wooden Stud" according to the invention. The bodies 3 can again be the same and the flanges 10 have an adjusted shape and width B^I.

[0023] Figure 4 shows an H-shaped cross-section 11 of the "Wooden Stud" according to the invention, in which the body 3 can again have the same shape and the flanges 12 have an enlarged width till B^I.

[0024] Figure 7 shows a horizontal cross-section 13, over a partition wall with "Wooden Studs" of an I-shaped cross-section 1. Between the flanges 2 an insulation layer 14 is applied and the I-shaped cross-section 1 is covered on both sides by means of, for example, gypsum boards and these are fixed with, for example, staples 16.

[0025] Finally it has to be emphasized, that the above description constitutes preferred embodiments of the "Wooden Stud", for example, for light, non-bearing but solid and smooth partition walls, and which have the same physical building characteristics with regard to sound insulation as the "Metal Stud" partition walls, but that further variations and modifications are still possible without departing the scope of this patent description.

Claims

1. Device constructed as a section with an I-, H-, [-, □-, T- or L-shaped cross-section, which sections are utilized as supporting elements in the broadest sense for partition walls as so called "Wooden Stud" elements and as supporting element connected with floor slabs, wall plates and roofing sheets, for example, for the wooden frame construction, **characterized in that**, the mentioned sections are constructed of strips of board material into the mentioned I-, H-, [-, □-, T- or L-shaped cross-section (1, 7, 9, 11), in which the interconnection of the mentioned strips of board material is done by means of moulded patterns and glue, in which a minimum thickness D of the board material is required, in which the preferred "Wooden Stud" profile for a partition wall, for example, has the I-shaped cross-section with a flange width B and section height A, in which the board material is preferably manufactured of durable managed forests, in which, for example, the making of the mentioned partition wall (13) on the flanges (2, 8, 10, 12) or outer sides of the mentioned "Wooden Stud" profiles, cover plates of in the market available materials can be applied by means of staples (16), screws and such and in which insulation material (14) can be applied in between the attached cover plates.

2. Device as claimed in claim 1, **characterized in**

that, the mentioned board material of the body (3) and flanges (2, 8, 10, 12) is an OSB (= Oriented Strand Board) plate material. and such.

3. Device as claimed in claim 1, **characterized in that**, the mentioned board material of the body (3) and flanges (2, 8, 10, 12) is plywood (= multiplex) plate material. 5
4. Device as claimed in claim 1, **characterized in that**, the mentioned board material of the body (3) and flanges (2, 8, 10, 12) is MPF plate material. 10
5. Device as claimed in claims 1 and 2, or 3, or 4, **characterized in that**, the mentioned connection of the parts by means of moulded patterns and glue exists of a self-gripping tooth connection (4) in, for example, a trapezium or round shape and in which the glue is a plastic adhesive. 15
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6. Device as claimed in aforementioned claims, **characterized in that**, the mentioned minimum thickness D of the board material can vary from 6 to 60 mm, preferably for the required plate material OSB a thickness D of approximately 9 mm, in which the preferred I-profile B can be 45 mm and the A values 50, 75 or 100 mm. 25
7. Device as claimed in claim 1, **characterized in that**, the mentioned board material of the body (3) and flanges (2, 8, 10, 12) is preferably made of a kind of wood produced in durable managed forests and with that has the FSC hallmark (FSC = Forest Stewardship Council). 30
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8. Device as claimed in claims 1 - 4, **characterized in that**, the mentioned board material of the body (3) and flanges (2, 8, 10, 12) can be standard quality (interior quality), water-proof quality (exterior quality) and/or fire-resistant impregnated wood. 40
9. Device as claimed in claims 1 and 2, **characterized in that**, the mentioned I-profile is constructed of a body (3) of OSB-plate material and flanges (2, 8, 10, 12) of finger-jointed softwood, such as pine-wood. 45
10. Device as claimed in claim 1, **characterized in that**, for example, for a partition wall construction (13) a U-profile (7) is placed against the ceiling, floor and walls and the posts are preferably of an I-shaped cross-section (7), in which the body (3) extrudes approx 20 mm from the ceiling and the bottom side can be placed flat on the U-shaped cross-section (7), and can be locked with a strip of board material, in which on one or both sides the created trellis of sections can be finished with plates, such as, for example, a gypsum board or plywood (15) 50
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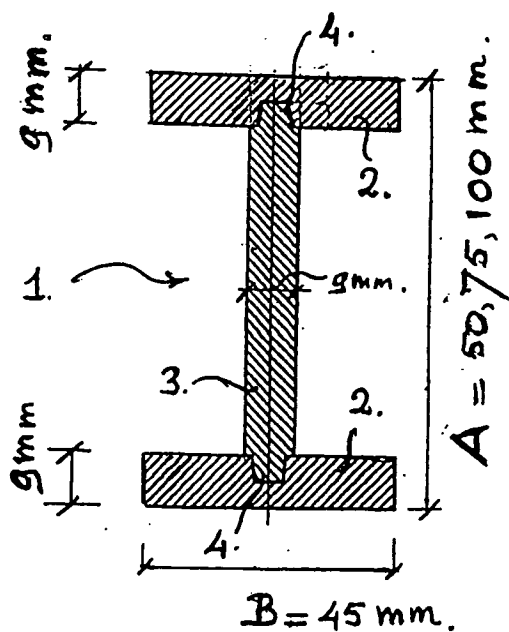


FIG. 1.

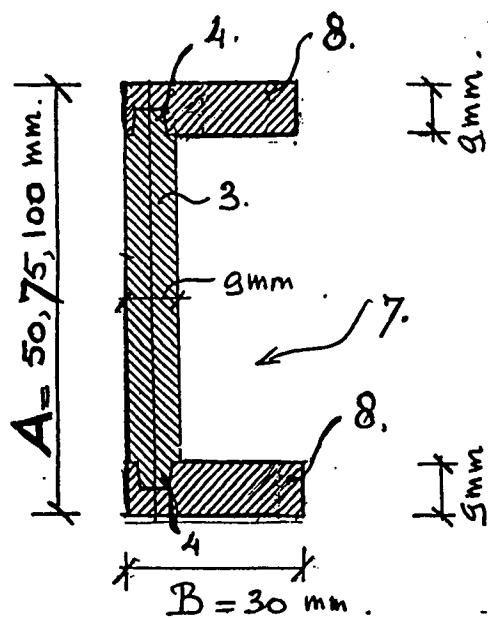


FIG. 2.

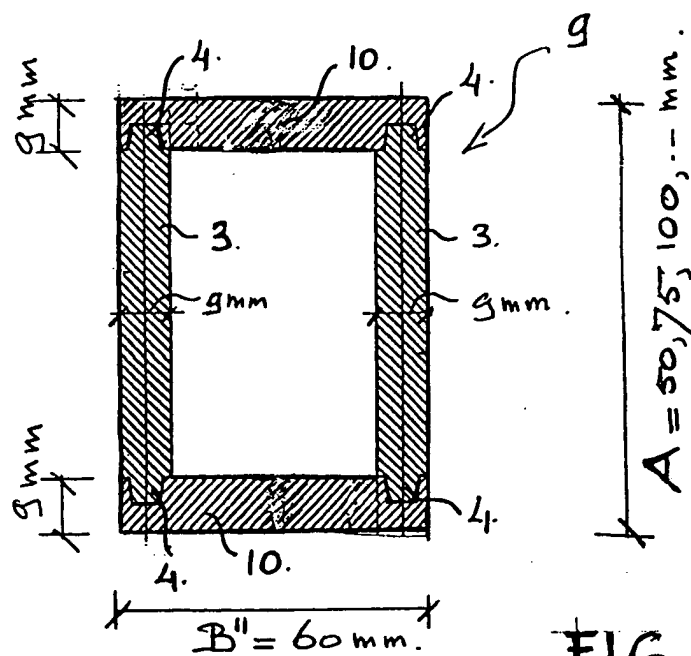


FIG. 3.

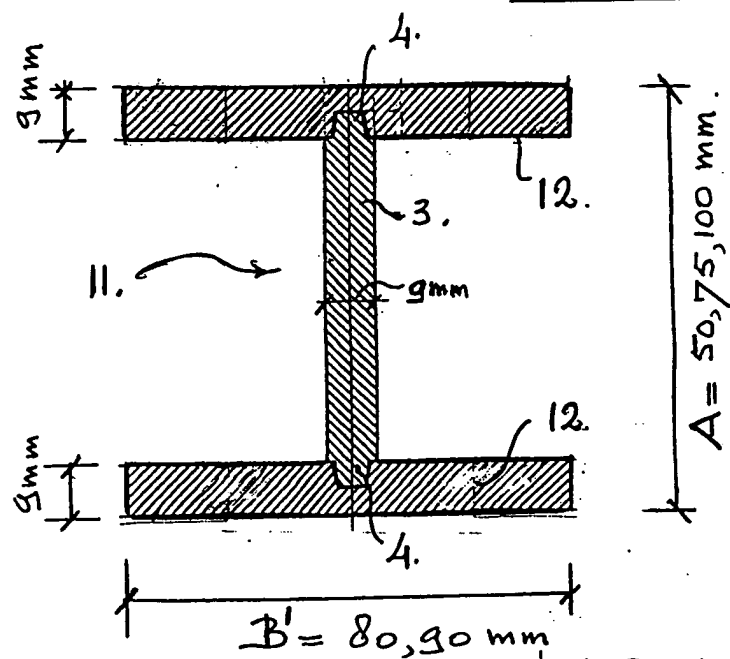
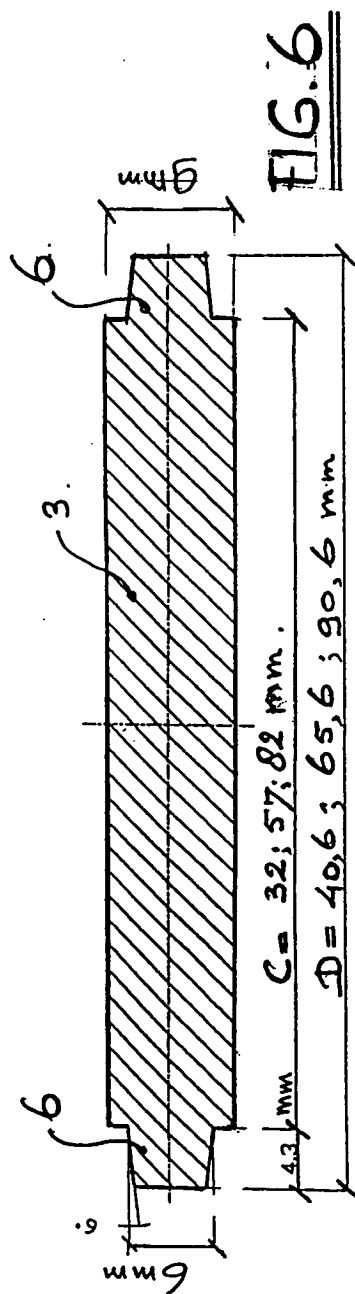
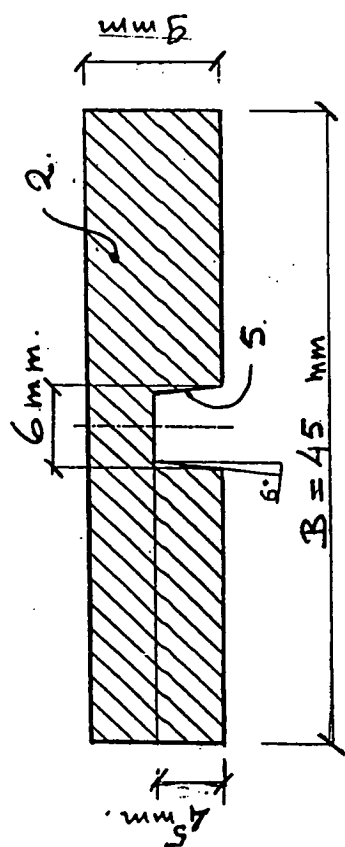
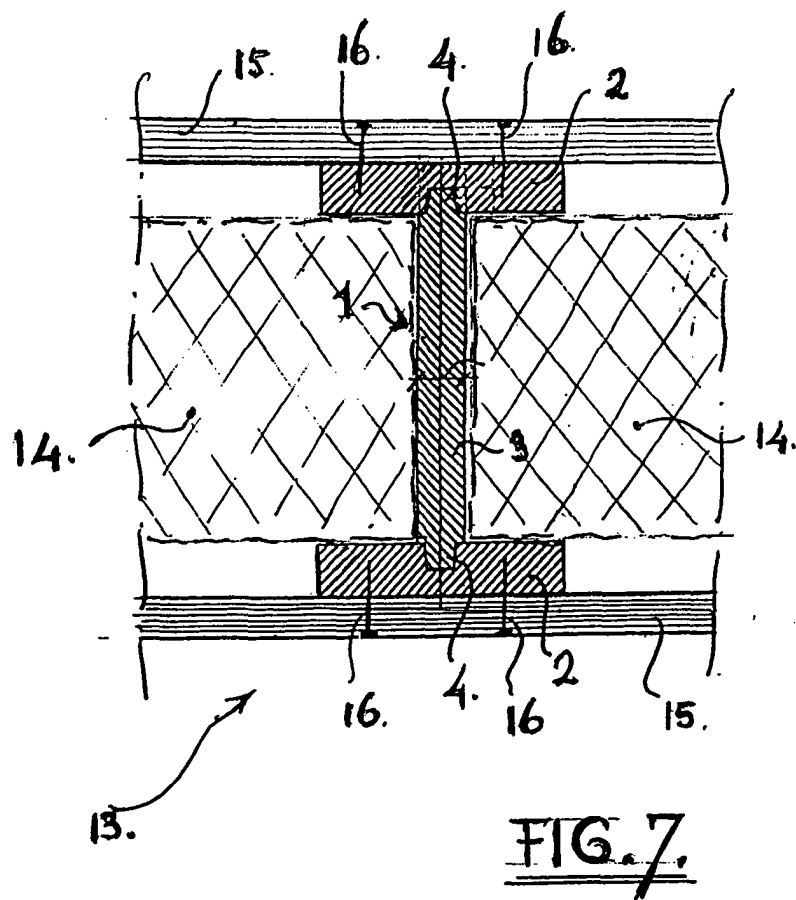


FIG. 4.







European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 03 07 8166

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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X	US 5 207 046 A (VEKKELI JOUKO) 4 May 1993 (1993-05-04) * claim 1; figure 5 *	1,5	
Y	EP 1 022 402 A (SCREEN SOLUTIONS LIMITED) 26 July 2000 (2000-07-26) * paragraph [0048] *	4	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Y	US 6 412 249 B1 (BOND JAMES R ET AL) 2 July 2002 (2002-07-02) * column 5, line 47-63 *	8	E04B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 23 January 2004	Examiner Rosborough, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 03 07 8166

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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