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(11) **EP 0 849 415 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.06.1998 Bulletin 1998/26

(51) Int. Cl.⁶: **E04F 13/06**, E04B 2/72,
E04C 2/40, E04C 2/04

(21) Application number: **97203883.0**

(22) Date of filing: **11.12.1997**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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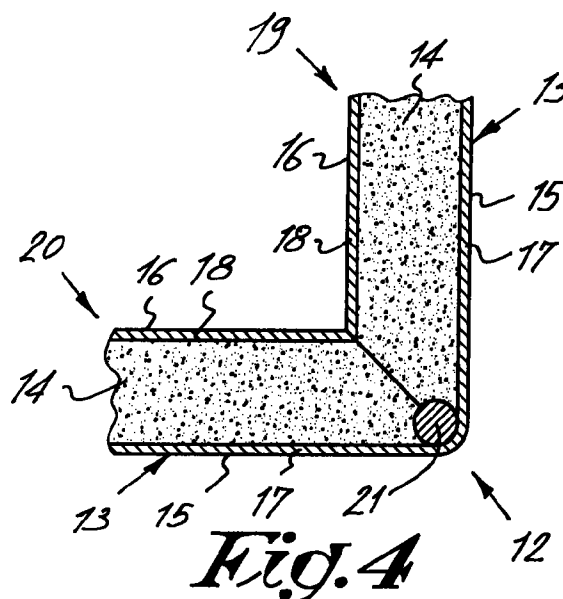
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(30) Priority: **19.12.1996 BE 9601068**

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(54) **Corner construction of cardboard-covered plaster board and method for realizing such corner construction, as well as auxiliary parts used therewith**

(57) Corner construction of cardboard-covered plaster board, whereby this board (13) consists of a core (14) and a covering layer (17) provided at least at one side (15) thereof, and whereby the board (13), with the exception of the covering layer (17), is interrupted at the height of the corner and is bent at the height of the covering layer (17) such that two board parts (19-20) are created which form an angle, characterized in that a profile (21) is provided between the board parts (19-20) which is impact-resistant, or at least offer a certain resistance against impacts, and which fits, respectively is situated against the covering layer (17), at the location where this latter is bent.



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Description

This invention relates to a corner construction of cardboard-covered plaster board, more particularly of a board consisting of a core of gypsum plaster or based on gypsum plaster and a covering layer provided at least at one side thereof.

The invention also relates to a method for realizing such corner construction, as well as auxiliary parts used therewith.

In the classic manner, an external corner of cardboard-covered plaster board is realized by placing the boards forming the corner against each other at this corner, attaching a zinc plated angular profile thereover and subsequently levelling the whole with filler to a smooth entire formation. In first instance, the angular profile used therewith is destined to provide a protection for the corner against external impacts and, in the second place, is also meant to provide for an adherence for the filling agent.

This classical technique shows the disadvantages that it requires a very time-consuming and precise activity on site; that additionally materials are necessary, such as an internal support profile which allows to fix the angular profile by nailing it on, the angular profile itself and filler; that this is a dirty work due to working with wet filler; and that the corner which is obtained as a result, no longer is a right angle, which may be esthetically undesirable, in particular in the case of certain natural or artificial incidences of light.

According to another known technique, a prefabricated corner construction is provided by milling a notch out of the cardboard-covered plaster board precisely up to the underlying cardboard layer and folding the cardboard-covered plaster board together. This method offers the advantage that the corners can be prefabricated in a workshop, such that on site only the installation has to be performed, without further finishing. Furthermore, with this method the use of additional finishing materials is almost excluded. More particularly, no external angular profile, no filler and, in many cases, also no internal fixation profile will be necessary any more.

Until now, this method, however, has the great disadvantage that the obtained external corners are no longer additionally protected and, as a result, are very sensible to external impacts. This results in that such prefabricated corner constructions are very suitable for the construction of ceilings and for wall parts at a height above the floor, but mostly are not suited for walls extending to the floor.

In order to still reinforce these latter corner constructions, an external angular profile may be attached, but this, then, again results in the already mentioned disadvantages of the aforementioned classical technique.

The technique of milling out of the cardboard-covered plaster board up to the underlying cardboard layer

and the subsequent folding tight of the cardboard-covered plaster board is described, amongst others, in WO 94/10403.

From WO 94/10403, it is also known to form a corner by making a relatively large recess in the board, in such a manner that two board parts are obtained, providing a flat strip in one of the board parts, and folding the whole at a distance from the free extremity of this strip. Hereby, the strip serves as a support for holding the cardboard board more or less flat, or as a fixation element for attaching the whole on a support structure. Considering that the strip does not extend up to the corner, a corner protection is not obtained.

Other techniques for forming corners are also known from US 4.387.128 and US 2.142.771. Hereby, constructions are intended which allow to realize a rounded-off corner. To this aim, a bendable strip is provided in the board at the place where the corner has to be realized, in such a manner that, by bending, a rounded-off corner is obtained.

The system described in the aforementioned two American patents is intended for the use in boards consisting of wood, plywood and similar and is not suited for being applied in cardboard-covered plaster boards. Considering that in cardboard-covered plaster boards the cardboard layer only adheres with a relatively small force to the core consisting of gypsum plaster, it is not possible to make use of an elastically bent element for forming a corner, as the cardboard, by means of the resilient reaction force in the bent strip, would be pushed off from the gypsum plaster core.

Considering that in the system described in the aforementioned American patents, the strip has to be bendable and, thus, relatively thin, the obtained corner has the disadvantage that it can easily be damaged by indenting.

The method for the attachment of the strip which is described in the aforementioned two American patents, is just as little applicable for cardboard-covered plaster boards, as, according to this method, the board is milled off at the visible side, after which the strip is attached and smoothed off, and the covering layer subsequently is attached hereover. It is obvious that this is not possible with cardboard-covered plaster boards, as the cardboard is already present on the boards since their manufacturing.

From US 3.911.554, a method is known for forming a corner out of a plate which is provided with a metal covering layer. Hereby, the corner can be reinforced at the interior side by means of an angular profile. This technique is not suitable for cardboard-covered plaster plates, as in this case a corner would be obtained which is very sensitive to external impacts.

From DE 3.937.231, a corner construction is known for plates of plastic foam, whereby the adjacent parts are connected by means of a tongue-and-groove connection clicking together. The connection obtained hereby does not offer an additional resistance against

external impacts. Furthermore, such connection is not suitable for cardboard-covered plaster boards, as the gypsum plaster core is not elastic and would break apart during clicking together.

From GB 403.218 and FR 708.939, metal profiles are known which can be fixed at the corner of a wall and thereby can be worked into a plastering. Such profiles, however, are not suitable to be used in walls of cardboard-covered plaster boards.

In DE-U1-9106350, a corner protection profile is described which in fact can be applied in combination with cardboard-covered plaster boards. In order to form a corner, two plates are attached with their straight edges up to the proximity of the corner protection profile, and the residual spaces are filled with a filling substance, such as plaster. The obtained corner construction has the disadvantage that the covering layer does not extend over the corner, as a result of which unevennesses may occur and, furthermore, that the corner protection profile is visible.

The invention aims at a corner construction which does not show the aforementioned disadvantages.

To this aim, the invention aims at a corner construction of cardboard-covered plaster board, whereby this board consists of a core and a covering layer provided at least at one side thereof, and whereby the board, with the exception of the covering layer, is interrupted at the height of the corner and is bent at the height of the covering layer such that two board parts are created which form an angle, characterized in that a profile is provided between these board parts, which is impact-resistant and which fits, respectively is situated against the covering layer, at the location where this latter is bent.

With "impact-resistant" is meant that the profile at least offers a reinforcement of the corner, such that it can better resist to impacts.

As a profile is enclosed between these board parts which is impact-resistant, an also impact-resistant corner construction is obtained. As the board parts still are connected to each other, it is not necessary to use external profiles. As the profile is closed in, an enlargement at the exterior side is avoided, as a result of which the disadvantages of the above described classical technique do not manifest themselves, in other words, the obtained corner is always perfectly straight, in such a way that which incidence of light whatsoever does not cause a disturbing effect.

Preferably, use shall be made of a rigid profile, with which is meant that this profile is so rigid that this profile, as well as the covering layer extending thereover, can not become indented at the height of the corner, and that this profile does not exert any resilient force onto the covering layer.

Preferably, the profile is also fitted against the covering layer in such a manner that this profile with its circumference is tangential to the prolongations of the inner sides of the covering layer of the two board parts.

Preferably, the material of the core of the two board

parts extends up to the aforementioned profile. As a result thereof, the profile is laterally blocked and actually is attached. Furthermore, as a result of this, it is obtained that the covering layer directly extends from the core of one board part up to the profile, and extends from the profile directly up to the core of the other board part, such that, at the height of the corner, no parts are formed where the covering layer is not supported. As a result of this, it is excluded that the covering layer may become deformed locally or may be easily indented and possibly might tear.

The corner construction of the invention can form a part of a prefabricated construction, whereby boards and corners are cut and constructed beforehand to size, with specific dimensions, adapted to the application.

The corner construction of the invention, however, can also be realized with standard dimensions, in such a manner that the corner construction, so to say, forms a corner element which exclusively has to be sawn to length, whereby the respective walls have to be adapted to the corner element.

The invention also relates to a method for realizing such corner constructions, either in a workshop or on site, in order to realize corner constructions to size for a specific application, or in a factory in order to realize standard designs in series production.

According to the invention, this method substantially consists in successively milling off the board at one side, up to the covering layer which is situated at the other side, thereby realizing a seat for a profile, providing the profile at the height of the seat, and folding the whole in the desired corner form. Preferably, the whole unit is glued together at the height of the corner. It is obvious that in this manner the corner construction can be realized very simple and very precisely.

In the most preferred form of embodiment, the enclosed profile is rod-shaped or comprises a rod-shaped part. As a result of this, an external corner is obtained which is much stronger than the reinforced corner obtained by means of the traditional system, as the traditionally applied corner protection profiles have a hollow angular side which can be easily indented.

It is also obvious that, according to the invention, the complete corner can be prepared in prefabrication in a workshop, such that the corner only has to be mounted on site, without the necessity of performing additional finishing activities. Thereby, the traditionally required finishing materials become redundant.

With the intention of better showing the characteristics of the invention, several preferred forms of embodiment are described hereafter, by means of example, without any limitative character, with reference to the accompanying drawings, wherein:

figure 1 represents a traditional embodiment of a corner construction;

figures 2 and 3 schematically represent an also known technique for forming a corner construction;

figure 4 in cross-section represents a corner construction according to the invention;

figures 5 and 6 represent how the corner construction from figure 4 can be realized;

figure 7 in cross-section represents a variant of a corner construction according to the invention;

figure 8 in cross-section represents another variant of the invention;

figure 9 in perspective represents the profile which is applied in the embodiment from figure 8.

As represented in figure 1, in a traditional corner construction 1 two cardboard-covered plaster boards 2-3 are placed at the height of the corner with their extremities against each other, against an internal support profile 4, and at the exterior side, an external angular profile 5 is provided thereupon which is hidden from sight by means of filler 6. Figure 1 demonstrates that hereby the disadvantages mentioned above in the introduction occur.

According to another technique already mentioned in the introduction, one starts, as shown in figure 2, with a cardboard-covered plaster board 7 in which a milled indentation 8 up to the lower cardboard layer 9 is provided, and the whole, as shown in figure 3, is folded tight, preferably against an internal support profile 10. It is obvious that the obtained corner construction 11 has little resistance against impacts.

In order to offer a solution for the aforementioned disadvantages, the invention, as shown in figure 4, provides in a corner construction 12 which is reinforced in a special manner.

As this is also the case in the embodiments from figures 1 to 3, reference is made to a corner construction 12 which is realized of a board 13 consisting of a core 14 and, provided at least at one side 15 thereof and preferably, as shown, at both sides 15-16, a covering layer, 17-18 respectively. Hereby, it is noted that the invention in the first instance is intended for classic cardboard-covered plaster boards, whereby the core 14 consists of gypsum plaster and the covering layers 17-18 consist of cardboard. More generally, however, according to the invention, the term "cardboard-covered plaster boards" also includes all boards having a core made of gypsum plaster or of a material based on gypsum plaster and which are provided with a covering layer 17 of a material which is foldable in a manner comparable to cardboard.

The particularity of the invention consists in that the corner construction 12 is characterized in that the board 13, with the exception of the covering layer 17, is interrupted at the height of the corner; that the board 13, at the height of the covering layer 17, is bent, respectively folded, such that two board parts 19-20 are created which form a corner; and that an impact-resistant profile 21 is enclosed between these board parts 19-20 which, as represented, fits against the covering layer 17, as a result of which an optimum resistance against impacts

is obtained, whereas the profile 21 still is kept from sight.

Preferably, the profile 21 is rounded off at least at the side which fits against the covering layer, in such a manner that a smooth corner is formed and no acute edges effect on the covering layer 17. In order to obtain this, a rod-shaped profile may be applied which preferably is massive.

In the embodiment of figure 4, the profile 21 is completely enclosed, as a result of which it perfectly remains at its place.

The narrow edges 22-23 of the board parts 19-20 are mitred and fit against each other.

At the height of the corner, the various joining parts can be mutually connected in that the whole is glued together.

The method of the invention, for realizing the corner construction 12 of figure 4, is illustrated in steps in figures 5 and 6.

First, the board 13, as shown in figure 5, is milled off at the side 16 until against the covering layer 17 situated at the other side 15. Hereby, on one hand, a recess 24 is formed with a top angle X which, in the case of a right corner, is 90°, and, on the other hand, a seat 25 which subsequently shall function as a corner space for the application of the aforementioned profile 21.

Then a glue 26 suited therefore is applied on the completely finished surface, after which, as shown in figure 6, the rod-shaped profile 21 is provided in the seat 25, over the complete length of the board 13. By subsequently, as indicated by arrow Y, folding the board parts 19-20 in respect to each other and giving the glue 26 the time to set, a corner construction, as illustrated in figure 4, is obtained.

It is obvious that, in certain applications, it is not excluded to make no use of glue.

In figure 7, a variant of the corner construction 12 of the invention is shown, whereby it is additionally reinforced by means of an internal angular profile 27, preferably an L-profile. This L-profile can be attached in any manner. In figure 7, this attachment is realized by means of screws 28, but according to a variant, use might also be made of glue or similar.

The embodiment from figure 7 makes the use of an internal support profile 4, such as shown in figure 1, redundant.

As shown in figure 8, the internal angular profile 27 can form a whole with the profile 21, for example, by being mutually connected by means of a flange 29 which then takes place between the edges 22-23 of the board parts 19-20. It is obvious that the recess 24 then is manufactured in a suitable manner to prevent that the presence of the flange 29 has a disturbing effect when the board parts 19-20 are folded in an angle.

For the sake of clearness, figure 9 shows the composed profile 30 which is applied in figure 8. As visible, the flange 29 preferably is connected to the corner of the L-shaped angular profile 27, in the direction of the

bisecting line of the legs of this profile 27.

It is obvious that the profile parts 21-27-30 may have various cross-sections. So, for example, it is possible, instead of using a rod-shaped profile 21, to make the flange 29 longer, in such a manner that it rests with its free extremity against the inner side of the covering layer 17, as a result of which this flange 29 itself will function as a corner reinforcement profile. The angular profile 27 must not necessarily be L-shaped but may also consist of a hollow or square profile, a triangular profile or similar.

The flange 29 must not necessarily be massive and may also consist of a series of local connections which, at well-defined distances, couple the profile 21 to the profile 27.

The profiles 21-27-30 may consist of different materials, such as metal, for example, aluminium, synthetic material, and so on.

As represented schematically in dash-dot line in figure 8, the corner construction 12 may form part of a standard corner element with board parts 19-20 which extend over well-defined distances A and B and which eventually are provided with chamfers 31-32 allowing an adaptation to adjacent boards, by means of a filling agent.

It is obvious that the corner constructions from figures 7 and 8 can be realized in the same manner as described heretofore by means of the figures 5 and 6.

It is obvious that the invention also relates to the special auxiliary elements which are used for the realization of such corner construction 12, by which the profiles are intended which are especially designed to this aim, such as, for example, the aforementioned composed profile 30.

It is obvious that, in all forms of embodiment, the whole either can be glued and/or screwed together or not, either with the application of additional auxiliary elements or not.

Although the profile 21 preferably is rounded off, this is no necessity. According to a variant, use can be made of an angular profile or a profile with an acute edge.

The rounded-off side of the profile 21 which fits against the covering layer 17, preferably has a rounding radius which is smaller than half of the thickness of the cardboard-covered plaster board 13. In the most extreme case, this rounding radius is nihil, which means that the corner is straight.

Preferably, the total thickness of the profile 21, or, in the case of a composed profile 30, the total thickness of the part which is situated between the board parts 19 and 20, measured according to the direction perpendicular to the bisecting line, is smaller than half of the thickness of the cardboard-covered plaster board 13.

By working with a profile 21 showing one or both of the last-mentioned characteristics, a very compact corner is obtained.

It is obvious that the profile 21 itself may consist of

several parts, for example, may consist of two profiles which are placed against each other, which either are or are not attached to each other.

As already mentioned, it is obvious that the aforementioned cardboard-covered plaster board can be of any kind. The material of the core may, for example, be reinforced with an armouring or with fibers. The covering layers 17 and/or 18 themselves may be composed of different layers which not necessarily all have to consist of cardboard.

With the characteristic that the profile 21 fits against the covering layer 17 is meant that the profile 21 may fit against this covering layer 17 directly, as well as indirectly. With the latter is meant that, for example, glue is present between the profile 21 and the covering layer 17, or that eventually a thin flexible film or similar is provided there between, for example, for forming a liquid-tight screen between the covering layer 17 and the metal of the profile 21.

Although the forms of embodiment represented in the figures always relate to angles of 90°, it is obvious that the invention is also applicable for corner constructions extending over other angles. The corresponding profiles 27 and/or 30 will then, of course, be adapted in shape.

The present invention is in no way limited to the forms of embodiment described by way of example and represented in the figures, however, on the contrary, such corner construction and method for the realization thereof and the auxiliary elements applied therewith, such as the composed profile 30, may be realized in various forms without leaving the scope of the invention.

Claims

1. Corner construction of cardboard-covered plaster board, whereby this board (13) consists of a core (14) and a covering layer (17) provided at least at one side (15) thereof, and whereby the board (13), with the exception of the covering layer (17), is interrupted at the height of the corner and is bent at the height of the covering layer (17) such that two board parts (19-20) are created which form an angle, characterized in that a profile (21) is provided between these board parts (19-20) which is impact-resistant, or at least offers a certain resistance against impacts, and which fits, respectively is situated against the covering layer (17), at the location where this latter is bent.
2. Corner construction according to claim 1, characterized in that the profile (21) consists of a rigid profile.
3. Corner construction according to claim 1 or 2, characterized in that the profile (21) is attached against the covering layer (17) in such a manner that this profile (12) is tangential to the prolongations of the

inner sides of the covering layer (17) of the two board parts (19-20).

4. Corner construction according to any of the preceding claims, characterized in that the two board parts (19-20) extend with their core up to the profile (21). 5
5. Corner construction according to any of the preceding claims, characterized in that the profile (21) is rounded off at least at the side which is directed towards the covering layer (17). 10
6. Corner construction according to any of the preceding claims, characterized in that the profile (21) is rod-shaped. 15
7. Corner construction according to any of the preceding claims, characterized in that it is provided with an internal angular profile (27) which fits against the board parts (19-20), whereby the board parts (19-20) eventually are screwed against the internal angular profile (27). 20
8. Corner construction according to any of the preceding claims, characterized in that the profile (21), or the composed profile (30) of which the profile (21) is a part, has dimensions which comply to one or both of the following parameters: 25
 - that the rounded-off side of the profile (21) which fits against the covering layer (17) has a rounding radius which is smaller than half of the thickness of the cardboard-covered plaster board (13); 30
 - that the total thickness of the profile (21), or, in the case of a composed profile (30), the total thickness of the part which is situated between the board parts (19-20), measured according to the direction perpendicular to the bisecting line, is smaller than half of the thickness of the cardboard-covered plaster board (13). 35 40
9. Corner construction according to any of the preceding claims, characterized in that the aforementioned profile (21) is completely enclosed between the core (14) of the surrounding board parts (19-20). 45
10. Corner construction according to claim 7 or 8, characterized in that the aforementioned profile (21) is manufactured in one part with the internal angular profile (27), such that both profiles form a composed profile (30). 50
11. Corner construction according to any of the preceding claims, characterized in that the whole is glued and/or screwed together. 55
12. Corner construction according to any of the aforementioned claims, characterized in that the board (13) is a cardboard-covered plaster board which is provided with a covering layer (17-18) from cardboard on both sides.
13. Method for realizing a corner construction, as described in any of the preceding claims, characterized in that it at least consists in successively milling off the board (13) at one side (16) up to the covering layer (17) which is situated at the other side (15), thereby realizing a seat (25) for a profile (21), providing the profile (21) at the height of the seat (25), and folding tight of the whole in the desired corner form.
14. Method according to claim 13, characterized in that during milling, a recess (24) in the shape of a well-defined angle is realized, in such a manner that the board parts (19-20) after folding match to each other in a mitred manner and that the aforementioned seat (25) is provided in the bottom of this recess (24).
15. Method according to claim 13 or 14, characterized in that the whole unit is glued together by first of all providing a quantity of glue (26) on the board at the height of the notch, subsequently bringing the profile (21-30) at its location and thereafter folding the whole unit together into the desired angle.
16. Auxiliary part for realizing a corner construction as described in any of the claims 1 to 12, characterized in that it consists of a composed profile (30) with a rod-shaped profile (21), an L-shaped angular profile (27) and a flange (29) which connects the angle of the L-shaped profile (27) to the rod-shaped profile (21).

Fig. 1

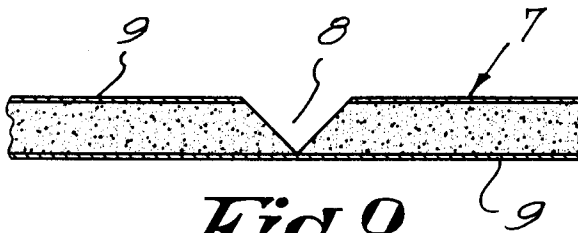
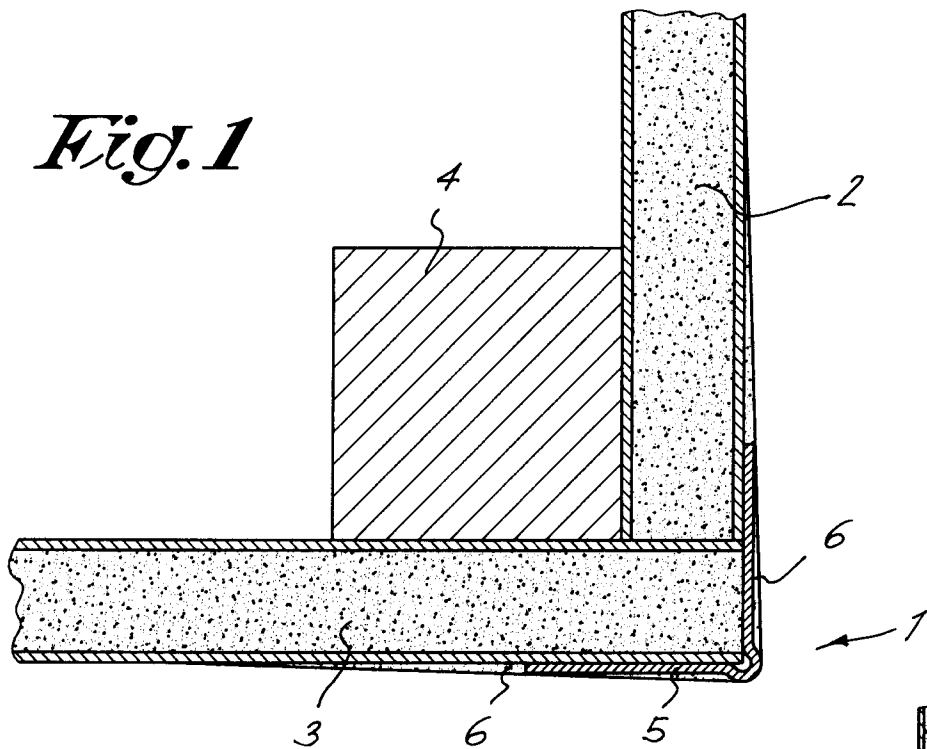


Fig. 2

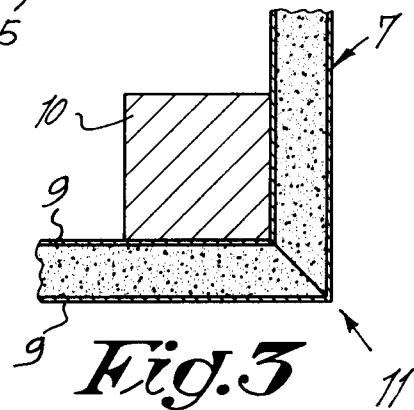


Fig. 3

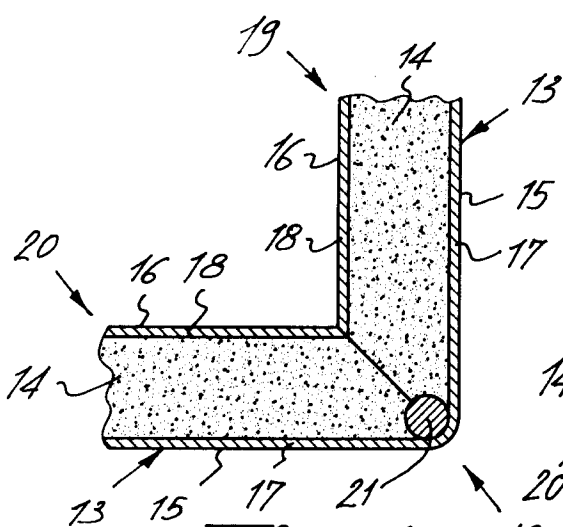


Fig. 4

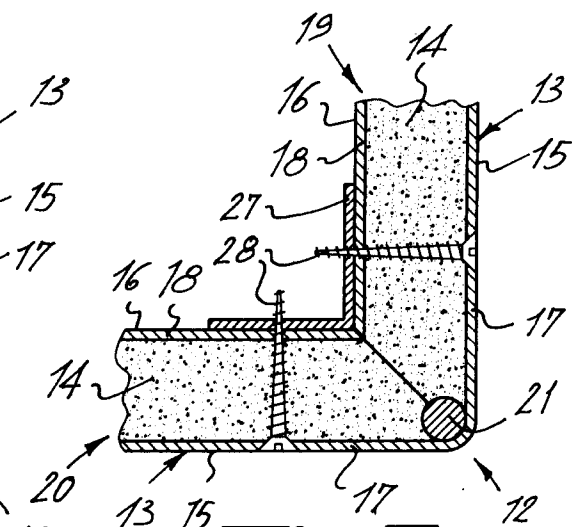
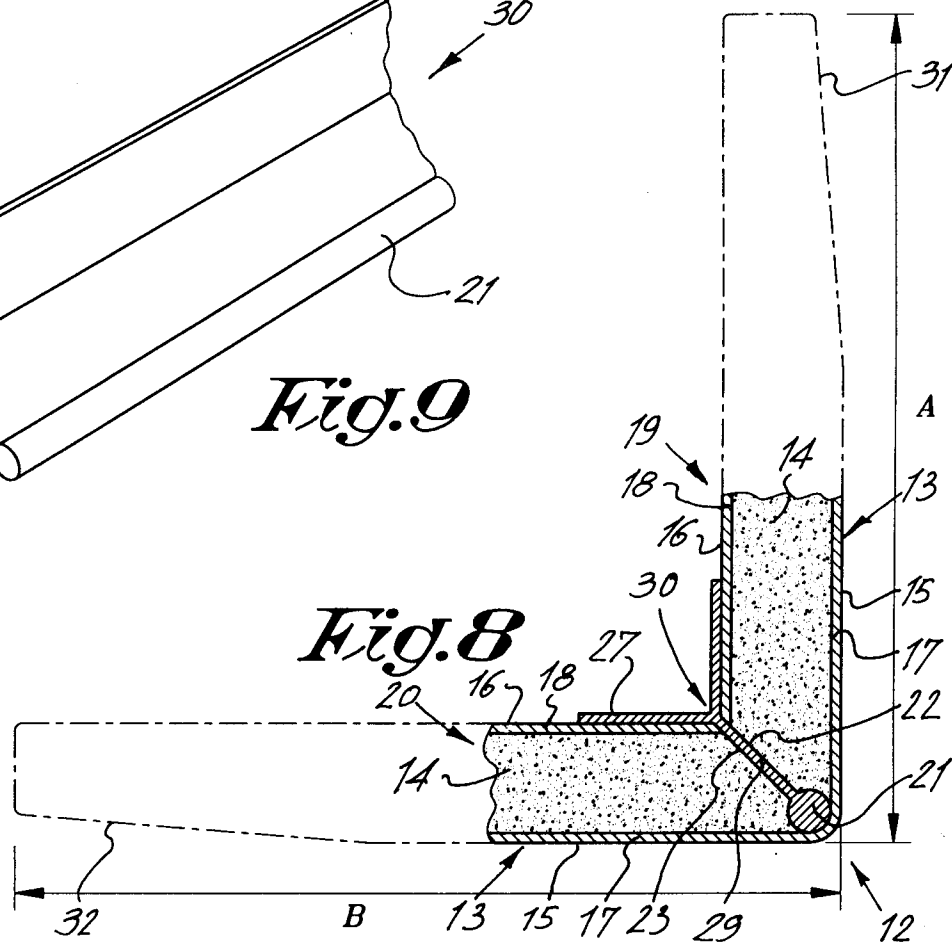
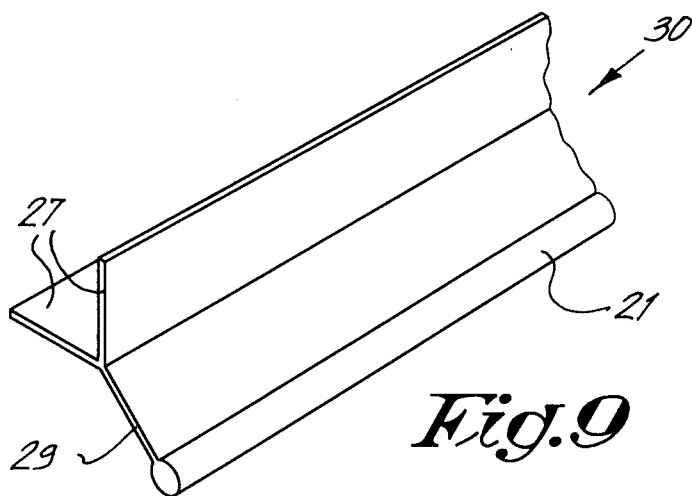
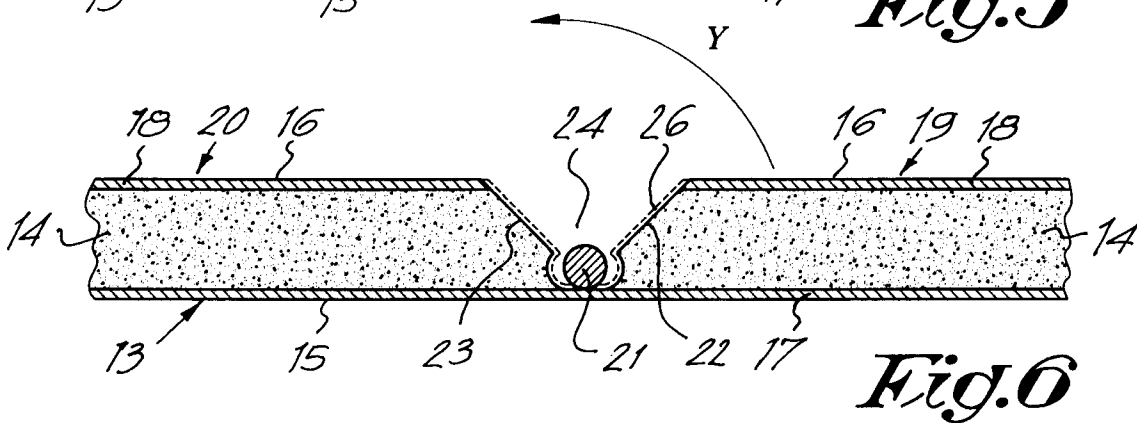
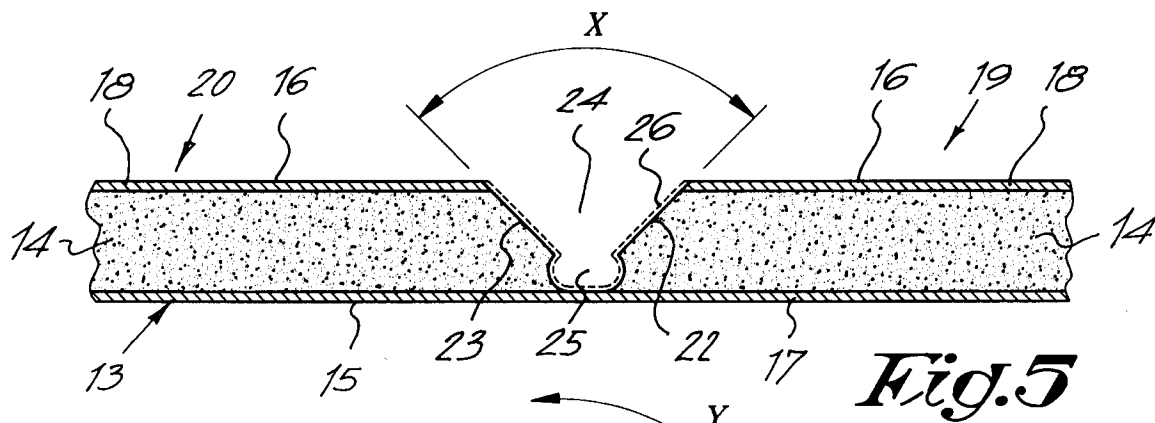


Fig. 7





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 20 3883

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,A	US 4 387 128 A (EMMS ET AL.) * column 2, line 41 - column 4, line 42; figures 1-9 * ---	1,3-9, 11,13,14	E04F13/06 E04B2/72 E04C2/40 E04C2/04
D,A	WO 94 10403 A (BARRANCE) * page 3, line 17 - page 6, line 36; figures 1-8 * ---	1,3,8, 12,13	
D,A	US 2 142 771 A (ALEXANDER) * the whole document * ---	1,3,5, 13,15	
D,A	GB 403 218 A (DARBYSHIRE) * page 2, line 105 - page 3, line 48; figures 1,2 * ---	1,6	
D,A	DE 91 06 350 U (JANNUSCH) * page 4, line 1 - page 5, line 33; figures 1-6 * ---	1,7	
D,A	DE 39 37 231 A (GEFINEX JACKON GMBH) * column 3, line 31 - column 4, line 66; figures 1,2,6 * ---	1,8,9, 13,14	E04F E04B E04C
D,A	US 3 911 554 A (FORD) * column 3, line 1 - column 6, line 12; figures 1-14 * ---	1,13-15	
D,A	FR 708 939 A (COPPENOLE) * the whole document * -----	1,16	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 23 February 1998	Examiner Ayiter, 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	

EPO FORM 1503 03/82 (P04C01)