

[54] WALL COVERING DEFINING A
CONTINUOUS VENTILATING
CONDUIT

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Related U.S. Application Data

- [63] Continuation-in-part of Ser. No. 861,212, July
23, 1969, abandoned, which is a continuation-
in-part of Ser. No. 648,755, June 26, 1967,
abandoned.
- [52] U.S. Cl.**52/303, 52/521, 52/522,**
52/549, 52/553
- [51] Int. Cl.**E04b 1/70, E04d 3/30, E04d 3/362**
- [58] Field of Search.....**52/303, 309, 521, 522, 547,**
52/549, 551, 553

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[57] **ABSTRACT**

A wall shingle consisting of a profiled panel having at an upper, horizontal edge means for fixing the panel to a wall. At the lower edge, the shingle has means for complementary connecting to a shingle below it so that a run of shingles may be extended upwardly. On the vertical edges the shingle has means for interconnecting with a complementary edge of an adjacent shingle. Conveniently, one edge is of a tongue and other of a groove construction of a particular type. The configuration and shape of the shingles is such that both the vertical and horizontal run of the shingles provides for a continuous air-space between the thus defined wall covering and the wall.

4 Claims, 7 Drawing Figures

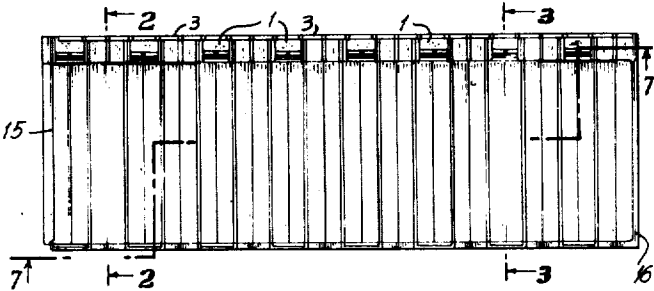


FIG. 1

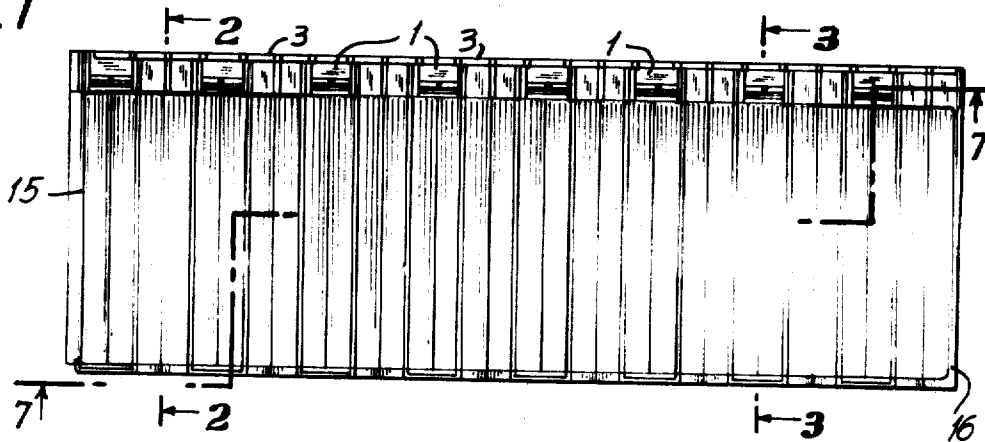


FIG. 2

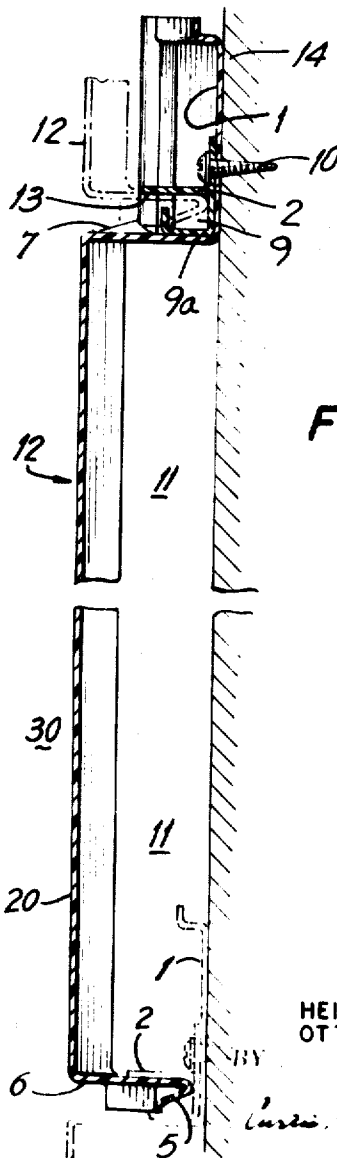
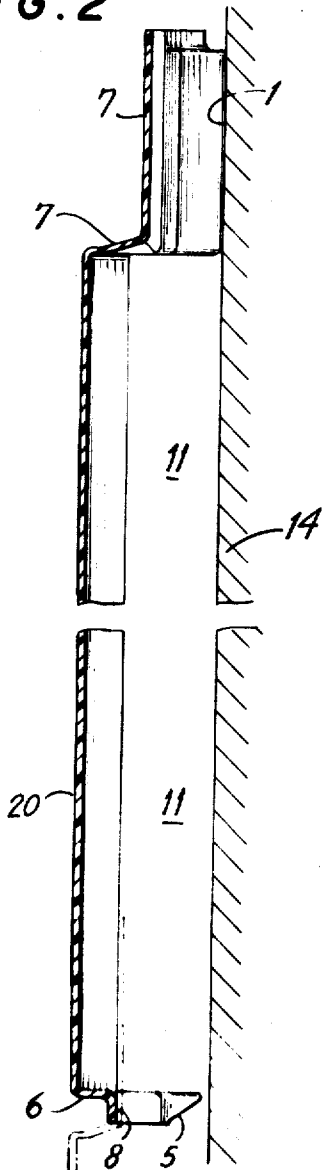


FIG. 3

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FIG. 4

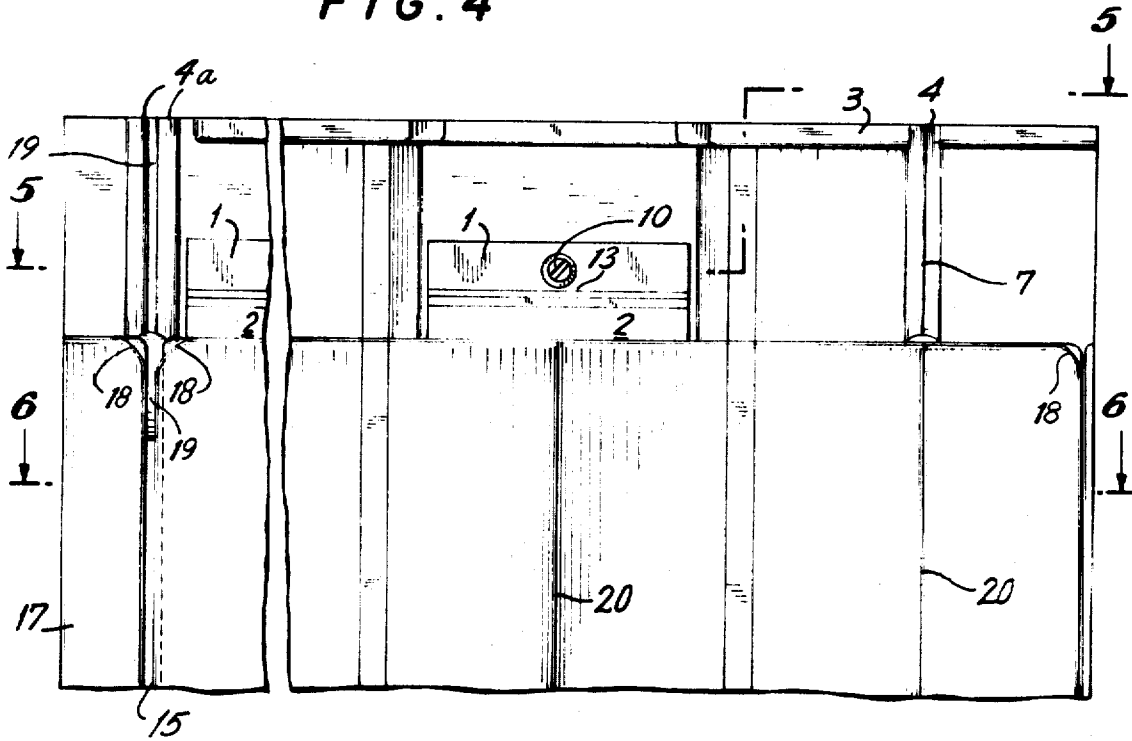


FIG. 5

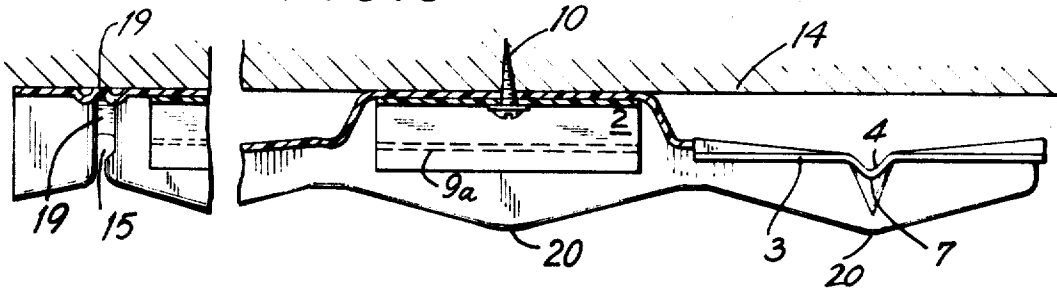
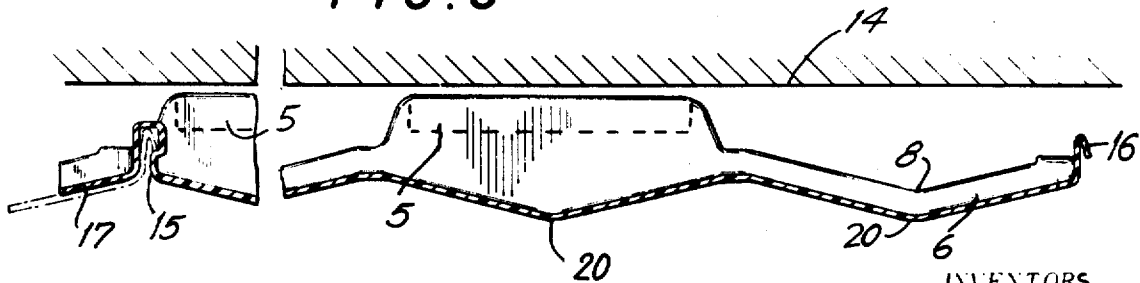


FIG. 6

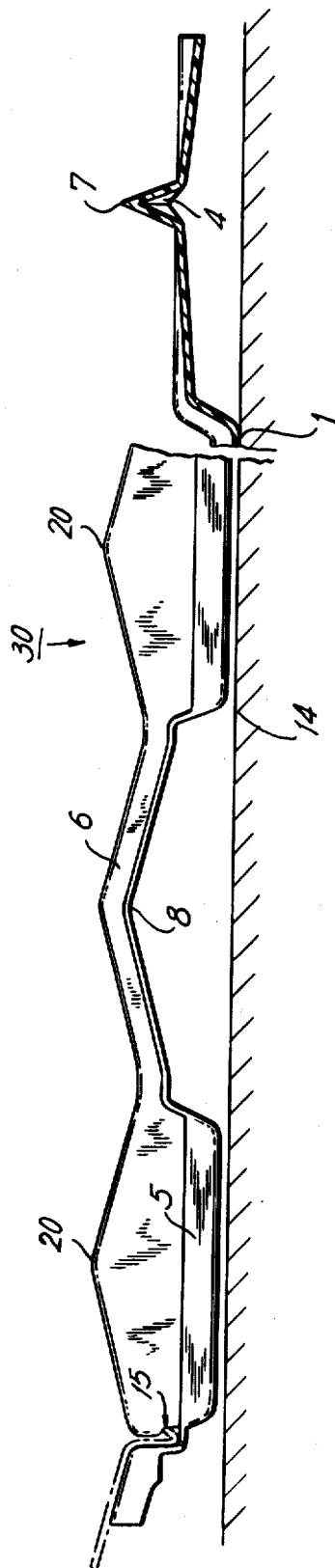


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FIG. 7



WALL COVERING DEFINING A CONTINUOUS VENTILATING CONDUIT

This application is a continuation-in-part of application Ser. No. 861,212 filed July 23, 1969, and now abandoned, which in turn is a streamlined continuation of application Ser. No. 648,755, filed June 26, 1967, and now abandoned.

This invention relates to wall shingles of large dimensions for the construction of ventilated wall coverings whereby a conduit space is provided between a wall and the non-exposed face of the shingle when horizontal and vertical runs of the shingles cover a wall. These wall shingles are profiled panels which, like roof shingles, are laid in overlapping relationship, but which differ from roof shingles in their form, size, horizontal and vertical interlocking means and the function these shingles perform in combination with a wall.

Profiled panels having two lateral locking edges with an air-space positioned between them have already been disclosed. These panels, usually manufactured by extrusion and known as tongue-and-groove panels, can be used for the construction of rear-ventilated wall coverings. Such profiled panels, however, have disadvantages regarding the draining of condensation and rain water, whether these are arranged in horizontal runs on vertical runs. Damp walls or substructures often occur when these panels are used. Furthermore, with such profiled panels, the means used for attaching the same to walls, for example, screws, can be seen from the outside, thermal expansion can only be taken up to a small extent, and there is only a small number of configurations possible for the exposed side of the profiled panel.

Profiled panels have also been proposed which are engaged by their two lateral edges in the substructure and which are clamped at the point of engagement by means of a resilient tube or a member of circular cross-section. These proposed profiled panels are preferably laid horizontally and the air-space behind the panels thus divided up into horizontal channels. As is the case with tongue-and-groove panels, disadvantages occur regarding water drainage, take-up of thermal expansion and the possible number of profile configurations. Condensed moisture collects at the clamping points and can thus penetrate directly into the wall.

Thus, in ventilating the space behind the exposed face of the shingle and between the unexposed face of the shingle and the wall, a number of prior art devices provide no proper solution to the problems because of the shortcomings associated with the ducting arrangement.

The present invention provides a wall shingle which comprises a profiled panel having at an upper, horizontal edge at least one means for fixing the panel to a wall. At the lower, horizontal edge, the shingle has means for complementary connecting with a shingle below it so that a run of shingles may be extended upwardly. On the vertical edges, the shingle has means for interconnecting with a complementary edge of an adjacent shingle. Conveniently, one vertical edge is of a particular tongue construction and the other is of a particular groove construction. The configuration and shape of the shingle is such that both the vertical and horizontal run of the shingles provides for a continuous air-space between the thus-formed wall covering and the wall.

Advantageously, there are at least two spaced apart means for attaching one edge of the shingle to the wall and, preferably, each pair of opposed edges of the shingle is provided with complementary connecting means which engage the shingle as well as the means for attaching the shingle to the wall to form a vertical run.

Advantageously, the shingles are so formed that a number of these can be assembled to form a horizontal run of a wall covering in which each shingle has a vertical locking edge or tongue which cooperates with a complementary vertical locking channel or groove on the adjacent shingle and also the upper edge of each shingle which is affixed to the wall.

Preferably the edge that will be uppermost when the shingle is affixed to a wall is provided with at least two spaced apart means for attaching this shingle to the wall and in this arrangement, the spaced apart means for attaching the upper edge advantageously incorporate also means for connecting the adjacent, vertically succeeding upper shingle. The means for attaching, as part thereof, have, for example, bracket means complementary to similarly spaced apart tab means on the upper, adjacent shingle engaging the bracket means. The tab means are on the lower edge of the shingle which will follow in the vertical run.

The bracket means consist of a locking clamp with a groove in the clamp positioned below the means for attaching, the last may be, for example, a flat plate carrying the clamp. When a wall covering is assembled, the means for attaching can be hidden by the lower edge of the upper, adjacent shingle. The means for attaching the shingles to the wall are, therefore, preferably set back from the outer, exposed surface of the profiled panel.

An arrangement of the wall shingles of the invention such as that described above gives a wall covering with continuous ventilation between the wall and the shingles whereby air ascends at low velocity because of the shingle construction, i.e. the tortuous path, in connection with the means for attaching the shingle to the wall. Additionally, the means for attaching the shingles are hidden from the eye.

In a further advantageous form of wall shingle according to the invention, the upper or lower edge of the shingle has spaced apart means for ducting or venting air. Thus, the opposite edges have similarly spaced apart vents and vent covering means so that, when the wall covering is assembled, spaced apart vent means are formed. Advantageously, the vent means are positioned between the spaced apart means for attaching the shingles which also comprise the previously described bracket means, for example, the clamp with a groove, and means for vent covering are positioned between the spaced apart means for connecting the shingles, for example, the tab means engaging the groove in the clamp. Thus, in the described wall covering a series of spaced apart vents are formed where the upper and lower horizontal edge of the shingles meet. With these vents, equalization of temperature in the air space between the wall and the shingle and the outside is realized and build up of condensation behind the wall-covering is eliminated. The removal of such condensation is further facilitated if the upper and lower edges of the shingles are slightly inclined to allow any condensation formed to run down from the vents.

Advantageously in this arrangement, each vent means comprises a vertical guide lug positioned midway across the width of the vent means. Each means for covering the vent has on its inner surface a corresponding surface element, which by its contact with the guide lug or a projection therefrom, provides a support for the means for covering the vent. This arrangement also facilitates the assembly of the wall-covering but does not substantially interfere with the effectiveness of the vents.

In a wall-covering assembled from shingles of the present invention each shingle is fixed to the wall at one edge only, advantageously the upper edge by the described means for attaching the wall shingles; and providing that there is some flexibility in the means for joining of the vertical and horizontal runs of shingles, expansion at all the edges is easily absorbed.

The shingles of the invention may be used in varying environments. If as a result of the environment a large degree of horizontal expansion in the surface of the shingle is likely to occur it is necessary to provide vertically extending undulations or grooves in the surface of the shingles, but this is only a choice in their design. The invention is not, however, limited to wall shingles having such vertically extending grooves. The surfaces of the shingles may, if desired, be printed with designs.

Provided that the wall shingles of the invention can be conveniently transported, there is no limit to their size but advantageously their width is in the range of from 250 to 500 centimeters and their height is in the range of from 50 to 100 centimeters.

The wall shingles of the present invention are advantageously manufactured from metallic materials such as plain and coated sheet. They can also be made of glass-fiber reinforced polyester resins or epoxy resins. Also suitable are thermoplastic materials, for example, polymethyl-methacrylate and rigid polyvinyl chloride. Wall shingles of the invention made of polyvinyl chloride having a chlorinated polyolefin content are especially advantageous regarding the ease of their manufacture, their appearance and their resistance to the effects of weathering.

One type of wall shingle in accordance with the present invention will now be described in greater detail by way of example only, with reference to the accompanying drawings in which:

FIG. 1 represents a front view of the wall shingle showing the exposed face of it;

FIG. 2 is a section taken along the line 2—2 of FIG. 1;

FIG. 3 is a section taken along the line 3—3 of FIG. 1;

FIG. 4 illustrates, in a front view, the upper horizontal edge of the wall shingle at one end thereof, i.e. vertical edge having a vertical groove therein;

FIG. 5 is a top view of the wall shingle along line 5—5 shown in FIG. 4;

FIG. 6 is a section through the air-duct, taken along the line 6—6 of FIG. 4;

FIG. 7 is part bottom view, part sectional view along line 7—7 of FIG. 1 and illustrates the clamping tabs 5 also shown in FIG. 6 as well as the spatial placement of a shingle in respect to the wall.

With reference to FIGS. 1 and 4, the wall shingle 30 comprises a profiled panel having along its upper

horizontal edge spaced apart means or surface for attaching the shingle to the wall labeled as 1 with a clamp 2 as part thereof. The clamp 2 defines a channel space 9 as shown in FIG. 3. Alternating with the surface 1 for attaching clamp 2 and the shingle 30 to wall 14 are spaced apart vent means 3, each of which includes a guide lug 4 as seen in FIG. 5. One side of the shingle, i.e. vertical edge has a locking groove 15 and the other, vertical edge has a complementary locking tongue 16. FIG. 6 shows that at its lower edge the shingle comprises spaced apart clamping tabs 5 (hidden, shown in cross section in FIG. 3) alternating with spaced apart means for covering the vent and labeled as 6 which also comprises an inner surface 8 and shown in FIG. 6.

The vent 3 and the means for covering the vent 6 are set back from the outer surface of the upper, vertically adjacent shingle 12 which covers the air-space 11, also seen in FIG. 2. The outer surface 7 of the guide lug 4 forms a support for the inner surface 8 of the vent covering part 6 as shown in FIGS. 5 and 6.

The clamps 2 each comprise a channel space 9 which runs below an upper, clamp ledge 13. The clamp has a second, upturned ledge 9a, in the form of a U. A screw 10 connects the attaching means 1 with unitary clamp 2 and the shingle 30 to the wall 14. As can be seen from FIGS. 3 and 6, the arrangement is such that when a clamping tab 5 of an upper shingle is interlocked in the clamp 2 the screw 10 is hidden by the surface 12 of the upper shingle.

The locking groove 15 and the locking tongue 16 because of the natural resiliency of the material which has been taken into consideration in designing these two elements of the shingle serve to connect securely adjacent shingles by their vertical edges lockingly engaging in each other and when the shingles are so connected the wing 17 shown in FIGS. 4 and 6 is overlapped by a portion of the surface 12 of the adjacent shingle; the wings 17 thus ensure that the lateral joints between the shingles are kept water-proof.

An edge 18 of the exterior surface 12 of the shingle at the upper horizontal edge is slightly sloped as seen in FIG. 4 so as to provide a downwardly directed drainage surface for any moisture that collects at the horizontal junction between two adjacent shingles. In FIGS. 4 and 5, the channel 19, which has two ribs 4a and which opens into the locking groove 15 is inclined to provide for a transition from the wall 14 to the groove 15 as shown in FIGS. 4, 5 and 6.

As shown in FIG. 7, the shingle 30 rests on the wall at the surface 1 on which the clamp 2 is placed and the clamping tabs 5 as shown in the bottom view of the shingle are spaced away from the wall because the clamp 2 and the shingle at surface 1 are between the tab 5 and wall 14.

The exterior surface 12 of the shingle has vertically extending creases or ribs 20. Thermal expansion acting across the shingle is thus compensated, the shingle 30 acting as a bellows or a concertina. The vents at the horizontal junctions have a similar effect. Any expansion along the horizontal junctions can be absorbed by the play in the interlocking connexion formed between the locking tongue 16 and the locking groove 15 or the tab 5 and the clamp 2.

As it can be envisioned from the Figures herein, a horizontal run and a vertical run of these shingles may

be provided. In both directions the shingles engage each other in the described manner providing for an especially attractive yet functionally outstanding wall covering.

What is claimed is:

1. A wall covering system providing moisture removal from a wall which comprises: on a wall a run of shingles in a horizontal direction and a run of shingles in vertical direction; each shingle having an exterior face including a face exposed to weather; each shingle having a back side exposed to said wall; a top horizontal edge of said shingle resting on said wall with a plurality of horizontally spaced apart surfaces; clamp means placed on said horizontally spaced apart surfaces on said exterior face thereof; each shingle having bent means spaced away from said wall at said top horizontal edge alternating with said horizontally spaced apart surfaces; each shingle having a bottom horizontal edge having a tab means for lockingly engaging with said clamp means on a top horizontal edge of a next shingle in said run of shingles in said vertical direction; vent means at said bottom edge alternating with said tab means whereby said vent means cover superimposed thereover a corresponding vent means on top, horizontal edge of said next shingle in said vertical run; each of said shingles having a first vertical edge having groove means therein; each of said shingles hav-

ing a second vertical edge having a tongue means; each of said tongue means engaging a groove means on a next, adjacent shingle in said run in horizontal direction; means extending from said groove means whereby said tongue and groove are sealingly engaged with each other; said shingles in said run in said horizontal direction and said run in said vertical direction defining a horizontal and vertical space whereby venting of said space is achieved.

2. The wall covering as defined in claim 1 and wherein the clamp means is placed exteriorly on the surface of said shingle which rests on said wall and said clamp means and said shingles are affixed to said wall from said exterior surface by fastening means therefor.

3. The wall covering as defined in claim 2 and wherein the clamp means have an upper ledge and an upturned lower ledge, said lower ledge being spaced apart from said upper ledge and defining channel means for receiving a resilient, locking tab from said upper, adjacent shingle in said vertical run.

4. The wall covering as defined in claim 1 and wherein said clamp means and said tab means of each successive shingle in said vertical direction cooperate to provide for attachment of said shingles only to said wall at the top horizontal edge of each shingle.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,686,813 Dated August 29, 1972

Inventor(s) Heinz Breitwieser et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Heading:

Item [63], "continuation-in-part of Ser. No. 648,755" should read --continuation of Ser. No. 648,755.--

After Item [63], the following should be inserted

[30] Foreign Application Priority Data

August 13, 1966 Germany.....F 49 937

Signed and sealed this 19th day of December 1972.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents