



HU000027192T2

(19) **HU****MAGYARORSZÁG**
Szellemi Tulajdon Nemzeti Hivatala(11) Lajstromszám: **E 027 192**(13) **T2****EURÓPAI SZABADALOM**
SZÖVEGÉNEK FORDÍTÁSA(21) Magyar ügyszám: **E 06 791649**(22) A bejelentés napja: **2006. 08. 25.**

(96) Az európai bejelentés bejelentési száma:

EP 20060791649

(97) Az európai bejelentés közzétételi adatai:

EP 1937910 A1**2007. 04. 26.**

(97) Az európai szabadalom megadásának meghirdetési adatai:

EP 1937910 B1**2016. 01. 06.**(51) Int. Cl.: **E04D 1/04**

(2006.01)

(86) A nemzetközi (PCT) bejelentési szám:

PCT/EP 06/008332

(87) A nemzetközi közzétételi szám:

WO 07045299

(30) Elsőbbségi adatok:

102005050657**2005. 10. 20.****DE**

(72) Feltaláló(k):

FINK, Josef, A-3372 Blindenmarkt (AT)

(73) Jogosult(ak):

Monier Roofing GmbH, 61440 Oberursel (DE)

(74) Képviselő:

**Danubia Szabadalmi és Jogi Iroda Kft.,
Budapest**

(54)

Tetőcserép legalább egy, kiemelkedésekkel határolt vízfolyóval

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

Roof tile with at least one water course defined by projections

Description

The invention relates to a roof tile according to the preamble to Patent Claim 1.

In the course of the manufacture of roof tiles using the extrusion process, a fresh concrete layer is applied as an endless ribbon to a string of adjoining lower moulds of identical length conveyed at a constant speed, which ribbon is formed appropriately on the upper side by means of moulding tools having the usual surface contour for roof tiles. The continuously applied fresh concrete layer is then cut to size in a cutting station at the end of a respective lower mould by means of a cutting tool configured as knife, so that each lower mould carries an individual roof tile blank. The roof tile blank lying on its lower mould then hardens in a drying chamber and is subsequently provided with a surface coating. A method of this kind for the manufacture of roof tiles is described in DE 35 22 846 A1.

In order to cover a pitched roof with roof tiles of this kind in a manner that is resistant to driving rain, it is necessary for the neighbouring roof tiles in a ridge-eaves line to be laid in an overlapping manner. The respective overlapping length is dependent in each case on the respective roof pitch, i.e. in the case of a very steep roof pitch the overlap can be selected such that it is smaller than in the case of a very shallow roof pitch.

Constructive measures have also been adopted, however, in which the roof tile is provided with transverse bottom ribs on its under side at the foot edge. The lower moulds familiar from DE 35 22 846 A1 are thus equipped on their transverse edges with depressions, such that the fresh concrete pressed into these depressions forms suspension lugs at the top edge of the roof tile blank and transversely oriented bottom ribs at the foot edge. In this way, the ridge-side roof tile can be positioned during laying with its suspension lugs hooked on a roof batten and with its bottom ribs resting on the surface of the adjacent roof tile in the direction of the eaves. The presence of the bottom ribs means that a kind of labyrinth, which counteracts the ingress of rainwater, is created in the overlapping region of the roof tiles.

The use of these roof tiles is problematic in the case of roofs with a pitch of less than 22°, however, since a very large overlapping length of the roof tiles is required because of the shallow pitch of the roof. Consequently, a very large number of parallel rows of roof tiles must be laid between the ridge and the eaves. The material and labour costs are increased considerably due to the requirement for a large number of roof tiles and for the establishment of a roof batten construction adapted to the number of rows of roof tiles. Buildings with very shallow roof pitches are thus frequently roofed with large-format, cheaper and lighter roofing materials, for example metal sheet or fibre cement panels.

As a result, a change has taken place in favour of providing the roof tiles on their upper side in the region of their top edge with a water barrier, which prevents the ingress of driving rain. The overlapping of the roof tiles can be reduced significantly in this way, so that the material and labour costs are reduced.

Methods are described in DE 18 12 456 A1 and DE 25 08 551 A1 which are suitable for providing the roof tile blanks resting on their lower moulds with a water barrier. In both methods, a water barrier is first formed from a separately supplied fresh concrete, which is then subsequently pressed or stuck onto the upper side of the roof tile blank in the region of the top edge. The water barrier in this case is of relatively broad execution, in order to assure, on the one hand, adequate dimensional stability and, on the other hand, a substance-to-substance bond over a large area.

However, the roof tiles equipped with a water barrier according to the above-mentioned method have the disadvantage that, because of the use of different fresh concretes, a weakening joint occurs between the roof tile and the water barrier, which joint is sensitive to shock and has a propensity to cracking.

In order to overcome this deficiency, the practice has been adopted according to GB 664010 whereby the water barrier is formed on the top edge of the roof tile blank as the string of fresh concrete is cut into individual roof tile blanks. The roof tile blank and the water barrier thus consist of the same fresh concrete. A good connection can be obtained in this way between the water barrier and the roof tile.

In order to ensure the stackability and packability of the roof tiles, however, the suspension lugs on the underside of the roof tile lying at the top in the stack must be arranged at a very great distance from the top edge of the roof tile, so that sufficient space is available for the water barrier arranged on the upper side and directly on the top edge of the roof tile lying in the subjacent stack.

By comparing the roof tiles according to GB 664010 provided with a water barrier with the roof tiles represented in DE 35 22 846, Fig. 6 and 7, in which the suspension lugs are arranged in an optimal manner directly on the top edge of the roof tile, it will then become clear that the roof tiles that are familiar from GB 664010 possess a significantly reduced covering length because of the large distance of the suspension lugs from the top edge of the roof tile. Consequently, a large number of parallel rows of roof tiles is still required.

It is disadvantageous from a production engineering point of view, furthermore, that a separate set of lower moulds is required for the manufacture of roof tiles with a water barrier according to GB 664010, because the position of the suspension lugs differs from the optimal position in the case of conventional roof tiles.

The object of the invention is thus to make available a roof tile provided with a water barrier, which is capable of being produced on conventional lower moulds, which is able to bring its full covering length to bear, including in the case of roofs with a very shallow roof pitch, and which assures a reliable and permanent attachment of the water barrier.

This object is accomplished according to the characterizing features of Patent Claim 1.

The invention thus relates to a roof tile which, for example, has a central rib and at least one lateral cover groove or water groove having an interjacent water channel, in the region of which a water barrier is arranged. This water barrier is pressed with its edges partially into the material of the roof tile blank in the region of the water channel, the central rib and the lateral groove. It comprises a flexible elastic thin plate, to be precise being a material which does not correspond to the material of the roof tile.

The advantage that is achieved with the invention consists in particular in the fact that the water barrier is retained mechanically by the hardened concrete surrounding it. Separation of the water barrier from the roof tile -- as often occurs because of the joint in the case of the water barriers according to DE 18 12 456 A1 and DE 25 08 551 A1 in conjunction with packing and laying the roof tiles -- is prevented in this way.

Moreover, since the water barrier can be pressed into the fresh concrete with a freely selectable distance to the top edge of the roof tile blank, the suspension lugs can remain in their optimal position directly on the top edge on the underside of the roof tile blank, furthermore, so that the conventional lower moulds can be used. As a result, the high investment costs for a separate set of lower moulds in addition to a reduction in the covering length of the roof tiles also do not apply compared with the roof tile that is familiar from GB 664010.

The distance from the water barrier to the top edge of the roof tile blank is dependent on the roof tile model and the suspension lug. In order for the water barrier not to constitute an obstacle in conjunction with stacking of the roof tiles, the distance should be at least 10 mm, although preferably 25 mm.

Compared with the relatively broad water barriers made of concrete according to DE 18 12 456 A1 and DE 25 08 551 A1 (and likewise also DE 17 59 427 A, DE 1 838 431 U, AT 27 842 E), a gain is made in the covering length if the water barrier is of plate-shaped configuration. At the same time, the insertion of the water barrier into the compacted fresh concrete is facilitated as a result. In order for it to possess adequate stiffness, the material thickness of the water barrier should be at least 0.25 mm, although preferably 1 mm.

For the penetration of the water barrier into the fresh concrete, it may be advantageous if the edges of the sides of the water barrier penetrating into the fresh concrete are wedge-shaped in the direction of insertion.

The geometry of the water barrier is adapted to the respective cross-sectional profile of the roof tile blank in order to be able to fit the water barrier optimally in the region of the water channel, the lateral groove and the central rib.

For roof tiles with a smooth water channel, the water barrier is preferably trapezoidal with equal sides, so that the long side (base of the trapezium) of the inserted water barrier is exposed, whereas the remaining sides are inserted into the concrete in each case in the region of the water channel, the central rib and the lateral groove. In the case of a trapezoidal water barrier, the respective angle enclosed by the base and the sides should lie in the region between 40 and 70 degrees. The angle is preferably 57 degrees.

Water barriers configured in the shape of a circular segment or sickle-shaped water barriers are suitable, on the other hand, for roof tiles with concave shaped water channels.

In order to prevent circumvention of the water barrier in the region of the lateral groove and the central rib by the ingress of rainwater in the overlapping region, the water barrier can be of taller execution in the region of its adjacent end at that point than in the region of the water channel.

The circumvention of the water barrier can be made more difficult in addition if a run-off channel is provided, at least in the region of the central rib, upstream of the water barrier, which channel drains rainwater escaping at the water barrier back into the water channel of the roof tile.

In order to obtain secure fixing of the water barrier, this should penetrate into the fresh concrete to a depth of at least 0.5 mm, although preferably 3 mm, in the region of the water channel, the central rib and the lateral groove.

The embedding of the water barrier in the fresh concrete can be improved if the water barrier has anchoring elements on its edges penetrating into the fresh concrete.

The anchoring elements in this case can be horn-shaped or hook-shaped. The anchoring elements can project significantly deeper into the fresh concrete in comparison to the other edges of the water barrier. The anchoring elements are thus able to penetrate to a depth of 5.5 mm, for example, whereas the other edges of the water barrier penetrate to a depth of only 3 mm.

The water barrier is produced from corrosion-resistant or at least corrosion-protected material. Since the material of the water barrier is also exposed to fluctuations in temperature, its coefficient of thermal longitudinal expansion should approach close to that of concrete, in order not to destroy the surrounding concrete. Preferred materials for the water barrier are plastic, aluminium alloys, steel coated with zinc or stainless steel.

In order to protect the roof tile permanently against dirt adhesion and algal growth, the roof tile provided with a water barrier is provided with a surface coating, for example a polymer emulsion paint. Not only are the water barrier and the roof tile uniformly coloured in the process, so that material differences are no longer evident, but at the same time the surface coating seals any gap that is present between the water barrier and the roof tile.

Illustrative embodiments of the invention are represented in the drawings and are described in more detail below. In the drawings:

Fig. 1 depicts a top view of a section of a roof tile according to the invention;

Fig. 2 depicts a cross-section through a roof tile having a first water barrier;

Fig. 3 depicts a cross-section through a roof tile having a second water barrier;

Fig. 4 depicts a cross-section through a roof tile having a third water barrier;

Fig. 5 depicts a longitudinal section through the roof tile according to Fig. 2.

Represented in Fig. 1 is a part of a roof tile 1 in a top view. This roof tile 1 has a lateral water groove 2 as well as a central rib 3. A water channel 4 is present between the water groove 2 and the rib 3. Arranged in this water channel 4 is a water barrier 5, which comprises a thin and elastic metal component or plastic component. This water barrier 5 is pressed partially with its edges into the compressed, although still fresh concrete of the roof tile 1 in each case in the region of the water channel 4, the central rib 3 and the lateral groove 2. Once the roof tile 1 has hardened, the water barrier 5 sits tightly in the roof tile 1.

Fig. 2 depicts a cross-section through the roof tile 1, wherein the lateral cover fold 6 can now also be seen. Present between the cover fold 6 and the central rib 3 is a further water barrier 7, which is likewise configured as a thin and elastic plate.

The water barriers 5 and 7 have the form of a trapezium, wherein the small sides of the trapezium are pressed into the water channels 4, 8. The inclined lateral edges 9, 10; 11, 12 of the water barriers 5, 7 engage in the water groove 2 or the cover fold 6 and in the central rib 3. The long sides of the trapezium are essentially exposed. The penetration of the water barriers 5, 7 into the fresh concrete is facilitated by their trapezoidal design.

It will be appreciated that the water barriers are adapted in each case to the profile of the roof tile blanks.

Represented in Fig. 3 are two water barriers 13, 14, which differ from the water barriers 5, 7 in Fig. 2 in that they have hooks 15 to 18 or 19 to 22 at the corner points of the trapezium. These hooks 15 to 22 serve as anchoring elements in the fresh concrete.

Fig. 4 depicts a further variant of a water barrier 23, in which the long side 24 of the trapezium is led upwards at the ends. Two raised hook-shaped anchoring elements 25, 26 are formed in this way.

The ends of the bottom side 27 of the trapezium are provided with horn-shaped anchoring elements 28, 29. The roof tile 1 is represented only with its right half in Fig. 4.

The water barriers are preferably produced from a corrosion-resistant or corrosion-protected material. Weatherproof plastics or metals, for example aluminium or copper, are suitable materials.

Represented in Fig. 5 is a longitudinal section A-A through the roof tile 1 according to Fig. 2. The water barrier 5, the central rib 3 and the water channel 4 can be identified here. The water barrier 5 at this point is situated at least 10 mm from the edge 30 of the roof tile 1. This edge 30 is arranged in the direction of the ridge after laying of the roof tile 1. The edge 30 is also part of a suspension lug.

The roof tile represented in Figs. 1 to 5 has an essentially smooth water channel 4. Trapezoid-shaped water barriers are suitable for this water channel 4.

If, on the other hand, the water channel has a concave shape, the water barrier is preferably configured in the shape of a circular segment or is sickle-shaped.

Tetőcserép legalább egy, kiemelkedésekkel határolt vízfolyóval

SZABADALMI IGÉNYPONTOK

1. Tetőcserép (1) legalább egy, kiemelkedésekkel (2, 3) határolt vízfolyóval (4), aminek a tartományában egy vízgát (5, 7; 13, 14; 23) van elrendezve, ahol a vízgát (5, 7; 13, 14; 23) peremeinek legalább egy része a vízfolyó (4) falába és a kiemelkedések (2, 3) falába benyúlik, **azzal jellemezve, hogy a vízgátat (5, 7; 13, 14; 23) egy hajlékony lapka alkotja.**
2. Az 1. igénypont szerinti tetőcserép, **azzal jellemezve, hogy a vízgátat (5, 7; 13, 14; 23) egy fém vagy fém ötvözet alkotja.**

3. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) egy műanyag alkotja.
4. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) hőátadási együtthatója közel azonos a tetőcserép (1) hőátadási együtthatójával.
5. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) vastagsága kevesebb, mint 3 mm.
6. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) vastagsága nagyobb, mint 0.25 mm.
7. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) vastagsága mintegy 1 mm.
8. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) oldalsó élénél ékes kialakítású.
9. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) trapéz alakú.
10. A 9. igénypont szerinti tetőcserép, azzal jellemezve, hogy a trapéz rövidebb oldala és oldalsó oldalai (9, 10) a tetőcserépbe (1) vannak benyomva, míg a trapéz hosszabbik oldala lényegében szabadon van.
11. A 9. igénypont szerinti tetőcserép, azzal jellemezve, hogy a trapéz rövidebb oldala és oldalsó oldalai (9, 10) közötti szög 40 és 70 fok között van.
12. A 9. igénypont szerinti tetőcserép, azzal jellemezve, hogy a trapéz rövidebb oldala és oldalsó oldalai (9, 10) közötti szög 57 fok.
13. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) körszegmens alakú.
14. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) sarló alakú.
15. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vízgát (5, 7; 13, 14; 23) kihorgonyzó elemekkel (19 – 22) van ellátva.
16. A 10. és 15. igénypont szerinti tetőcserép, azzal jellemezve, hogy a kihorgonyzó elemek (19 – 22) a trapéz sarkainál vannak elrendezve.
17. A 10. és 16. igénypont szerinti tetőcserép, azzal jellemezve, hogy a kihorgonyzó elemek (19 – 22) kampó alakúak.
18. A 10. igénypont szerinti tetőcserép, azzal jellemezve, hogy a trapéz hosszabbik oldala (24) végeinél magasabban fekszik, mint közepén.
19. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy az egyik kiemelkedés, ami a vízlefolyót (4) határolja, egy középső karima (3).
20. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy az többi kiemelkedés, amik a vízlefolyót (4) határolják, oldalsó fedő vagy lefolyó peremek.

21. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vizgát (5, 7; 13, 14; 23) legalább 10 mm távolságra van a tetőcserép (1) oromoldali peremétől (30).
22. A 21. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vizgát (5, 7; 13, 14; 23) 25 mm távolságra van a tetőcserép (1) oromoldali peremétől (30).
23. A 19. igénypont szerinti tetőcserép, azzal jellemezve, hogy a középső karima (3) egy, a vizgát (5, 7; 13, 14; 23) fölötti lefolyóperemmel van ellátva.
24. Az 1. igénypont szerinti tetőcserép, azzal jellemezve, hogy a vizgát (5, 7; 13, 14; 23) legalább 0,5 mm-nyire benyúlik a tetőcserépbe (1).

Fig. 3

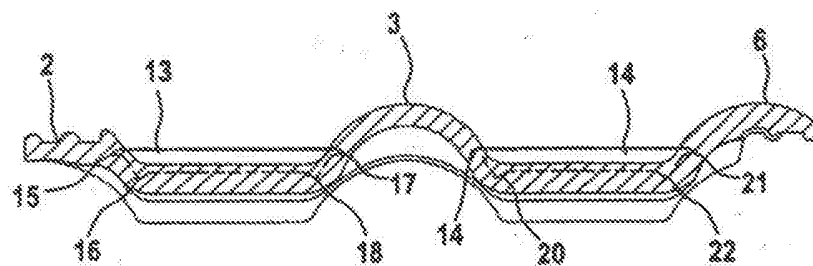


Fig. 4

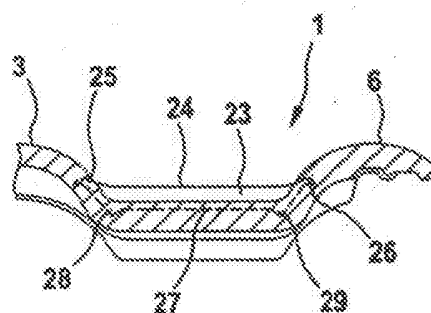


Fig. 5

