



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.07.2009 Bulletin 2009/31

(51) Int Cl.:
A47K 3/00 (2006.01)

(21) Application number: **08150476.3**

(22) Date of filing: **22.01.2008**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**
Designated Extension States:
AL BA MK RS

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(54) **Waterproof sealing profile**

(57) A sealing profile is intended for waterproof sealing of a gap between a wall surface and a sanitary ware surface. The profiles comprise a first strip (2) and a second strip (2), which are foldable in relation to each other along a longitudinal folding line. The folding line is pro-

vided in a bending zone (3), which is made of a softer material than the material of the first and the second strip. The softer material has a shore A hardness value of 70 or lower. The folding line has a thickness of at least 50 % of the thickness of the strips.

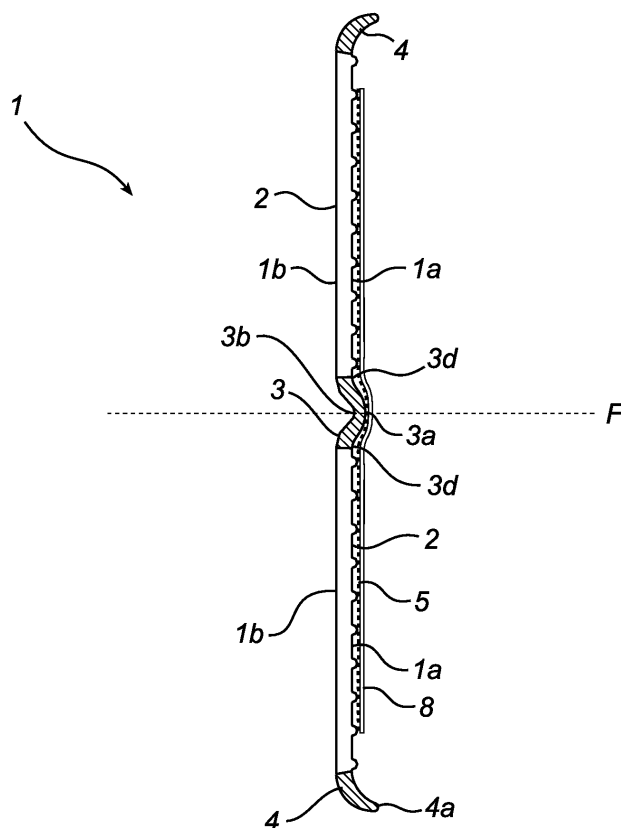


Fig. 1

Description

Technical Field of the Invention

[0001] Present invention relates to a sealing profile for waterproof sealing of a gap between a wall surface and a sanitary ware surface, comprising a first strip and a second strip, which are foldable in relation to each other along a longitudinal folding line.

Background Art

[0002] This type of sealing profiles are used as waterproof barrier between two surfaces, especially between a sanitary item, such as a bath, a basin, or a work surface, and a wall, for preventing seepage of water between the two surfaces. The problem with providing waterproof seals in bathrooms and kitchens have through the years resulted in a wide variety of sealing profile designs.

[0003] US 2003/017548 refers to a sealing member with a trapezoidal form and further shows a L-shaped strip with a sort of film hinge as prior art.

[0004] In DE 10 2004 003823 is shown a sealing member essentially in the form of a right-angled triangle.

[0005] In GB 2 136 288 is described a sealing member for sealing a gap between a bath or basin and an adjacent wall. This sealing member has, as seen in cross-section, a first limb to be attached to the wall and a second limb extending from the first limb. The first and the second limbs are substantially rigid and provided at their free ends with lips made of a softer material. Due to the rigid limbs the sealing member is only suitable for attachment to surfaces forming an angle of approx. 90° in relation to each other.

[0006] The problem with these sealing members is that they are unflexible and hard to attach to non-right-angled corners. As the corners to be sealed in bathrooms often differ from a right angle the known sealing strips do not always fulfil their purpose. But on the other hand is the more flexible the L-shaped strip mentioned above more prone to crack as its thin hinge acts as a stress concentration point. Consequently a strip of this kind has a shorter useful life.

[0007] Hence there is a need of a waterproof, flexible and resistant sealing profile, which can be attached to surfaces, arranged in a wide variety of angles in relation to each other and which has a long useful life. The profile should also be easy to manufacture and to install, especially for a DIY person.

Summary of the Invention

[0008] The object of the invention is to meet this need. This is accomplished with a sealing profile, comprising a first strip and a second strip which are foldable in relation to each other along a longitudinal folding line, which profile is **characterized in that** the folding line is provided in a bending zone, which is made of a softer material

than the material of the first and the second strip, which softer material has a shore A hardness value of 70 or lower, and in that the folding line has a thickness of at least 50 % of the thickness of the strips. The softer material of the bending zone should further preferably have a shore A hardness value of at least 20 less than the shore A hardness value of the material of the strips. This combination of features provides for a flexible and durable sealing profile.

[0009] The bending zone, as seen in cross-section, is formed like a knee, with a knee cap on a first profile surface, intended to face the wall surface and the sanitary ware surface, and a bend of a knee on a second profile surface, opposite the first profile surface, wherein the first profile surface, including the knee cap suitably is provided with an adhesive, covered with a release paper. In this way, the first profile surface will along the whole knee-cap surface be provided with an adhesive, thus able to adhere to even an innermost part of an inner corner at the wall and gap to be sealed.

[0010] Preferably, each strip along its free long side has a sealing lip, which is made of a softer material than the material of the first and the second strip, which softer material has a shore A hardness value of 70 or lower and of at least 20 less than the shore A hardness value of the strips. The lips are not provided with an adhesive but are, due to the soft material, sealing by their own resilience against the wall surface and the sanitary ware surface.

[0011] For a cost-effective manufacturing the sealing profile is suitably integrally formed by co-extruding the strips, the bending zone and the lips as a flat blank.

[0012] The kneecap and the free end of the lips on the first and second strip, are, as seen in cross-section of the flat blank, preferably protruding in the same direction and essentially in the same degree in relation to the first profile surface. As these protruding parts are pressed against the wall surface with the same force they will be subject to a recovery force in the same degree.

[0013] The bend of the knee and the first profile surface are lying in the same plane, as seen in cross section of the flat blank. This design creates a bending indication at a connection between the bending zone and each strip. When the profile is attached to a wall surface and a sanitary ware surface, this indication will make the bending zone, due to the shape memory of the material, press the strips against said surfaces, further contributing to the adhesion between the profile and the surfaces.

Brief Description of the Drawings

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[0014] In the following, a preferred embodiment of sealing profile according to the invention is described in greater detail with reference to the accompanying drawings, in which

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Fig 1 is a cross section of a sealing profile according to the invention as a flat blank provided with an adhesive with a release paper,

Fig 2 shows the sealing profile in fig 1 folded,
Fig 3 shows the sealing profile in fig 1 attached to a wall and a bathtub.

Detailed Description of Preferred Embodiments of the Invention

[0015] The sealing profile 1 in fig 1-3 is a profile for waterproof sealing of a gap between a wall and a sanitary ware, which in the shown example is a bathtub, but which might also be a washbasin, sink or work surface. The profile 1 comprises a first strip 2 and a second strip 2 which are foldable in relation to each other along a longitudinal folding line. The thickness at the folding line, along the theoretical folding line F shown in fig 3, is at least 50 % of the thickness of the strips. It is possible to use the sealing profile 1 for a gap, which is approximately as wide as half the width of a strip.

[0016] The folding line is provided in a bending zone 3. The bending zone 3, as seen in cross-section, is formed like a knee, with a knee cap 3a on a first profile surface 1 a, intended to face the wall surface and the bath tub surface, and a bend 3b of a knee on a second profile surface 1 b, opposite the first profile surface 1a.

[0017] Each strip has along its free long side a sealing lip 4.

[0018] An adhesive 5, covered with a release paper 8, is provided on the first profile surface 1 a, including the kneecap 3a but not on the lips 4 and part of the strips adjacent the lips.

[0019] The sealing profile is made of environment-friendly halogen free polymer material.

[0020] The bending zone 3 and sealing lips 4 are made of a softer material than the material of the first and the second strip, but the lips and the bending zone need not be of the same material. The material of the strips has a shore A hardness of at least 90. The softer materials have a shore A hardness value of 70 or lower, i.e. at least 20 less than the shore A hardness value of the material of the strips, which makes the bending zone 3 flexible such that the strips are foldable in an angle of 70-180° in relation to each other, and hence the profile is able to seal a gap between surfaces which are arranged in an angle of 70-180° in relation to each other. The softer material is preferably an EPDM terpolymer.

[0021] The sealing profile 1 is integrally formed by co-extruding the strips, the accurate bending zone 3 and the lips 4 as a flat blank. The blank is then provided with the adhesive 5, covered with the release paper 8 and cut to lengths suitable for transport and storing.

[0022] The sealing profile 1 can also be manufactured by triextrusion if the lips and the bending zone are made of different materials.

[0023] Before application of the profile a corner to be sealed is carefully cleaned. The profile is folded, which will stretch the first profile surface 1 a in the bending zone 3, distributing the adhesive over the zone. The release paper 8 is removed from the profile, and the profile is

pressed into to the corner.

[0024] When attached to a surface the material of the bending zone 3 will be subjected to a constant stress due to the stretching. This stress might lead to cracking. As the folding line has a thickness of at least 50 % of the thickness of the strips it will be less prone to stress cracking than prior art seals. Still, due to the softer material of the bending zone 3 the strips are easy to fold and arrange in different angles in relation to each other.

[0025] Further the bending zone 3 will try to retake its original form as extruded due to its shape memory, i.e. its inherent recovery force. As extruded the bend 3b of the knee and the first profile surface 1 a are lying in the same plane, creating a bending indication 3d at a connection between the bending zone 3 and each strip 2. When the profile is attached to the wall surface 6 and the bathtub surface 7, this indication that will make the bending zone 3, due to its shape memory, press the strips against said surfaces, further contributing to the attachment between the profile and the surfaces. Even the part of profile covering the gap, hence not attached to any surface, will in this way be pressed towards the bathtub.

[0026] The kneecap 3a and the free end of the lips 4 on the first and second strip, as seen in cross-section of the flat blank in Fig 3, are protruding in the same direction and essentially in the same degree in relation to the first profile surface 1 a. When the profile 1 is attached to a surface the lips 4 are deformed and by their own resilience pressed against the surface, sealing between of the profile itself and the surface.

[0027] The softer material of the lips in combination with the elastic properties of the strips themselves make it possible to attach the profile securely to non planar wall surfaces, such as tiles with splices and glasfiber fabric.

[0028] As all the surfaces to seal in a bathroom do not have a 90 ° relationship the sealing profile according the invention makes it possible to use the same profile for different gaps to be sealed in a bathroom giving a more aesthetic impression. The first and the second strip can have different lengths, depending on the gap to be sealed, which further increases its flexibility.

[0029] According the invention the material properties, such as creep, flexibility and recovery, are optimised for providing a sealing profile with improved sealing and adhering properties and durability.

Claims

1. Sealing profile for waterproof sealing of a gap between a wall surface and a sanitary ware surface, comprising a first strip (2) and a second strip (2) which are foldable in relation to each other along a longitudinal folding line,

characterized in that the folding line is provided in a bending zone (3), which is made of a softer material

than the material of the first and the second strip, which softer material has a shore A hardness value of 70 or lower, and **in that** the folding line has a thickness of at least 50 % of the thickness of the strips.

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2. Sealing profile according to claim 1, in which the softer material of the bending zone (3) has a shore A hardness value of at least 20 less than the shore A hardness value of the material of the strips. 10
3. Sealing profile according to claim 1 or 2, in which the bending zone (3), as seen in cross-section, is formed like a knee, with a knee cap (3a) on a first profile surface (1 a), intended to face the wall surface and the sanitary ware surface, and a bend (3b) of a knee on a second profile surface (1 b), opposite the first profile surface, wherein the first profile surface (1 a), including the knee cap (3a) is provided with an adhesive (5), covered with a release paper (8). 15
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4. Sealing profile according to any of claim 1-3, wherein each strip (2) along its free long side has a sealing lip (4), made of a softer material than the material of the first and the second strip, which softer material has a shore A hardness value of 70 or lower. 25
5. Sealing profile according to claim 6, in which the softer material of each sealing lip (4) has a shore A hardness value of at least 20 less than the shore A hardness value of the strips (2). 30
6. Sealing profile according to any of claim 1-5, which is integrally formed by co-extruding the strips (2) and the bending zone (3) as a flat blank. 35
7. Sealing profile according to claim 4, which is integrally formed by co-extruding the strips (2), the bending zone (3) and the lips (4) as a flat blank. 40
8. Sealing profile according to claim 3 and 7, in which the knee cap (3a) and the free end (4a) of the lip (4) on the first and second strip, as seen in cross-section of the flat blank, are protruding in the same direction and essentially in the same degree in relation to the first profile surface (1 a). 45
9. Sealing profile according to claim 7 or 8, wherein the bend (3b) of the knee and the first profile surface (1 a) are lying in the same plane, as seen in cross section of the flat blank. 50

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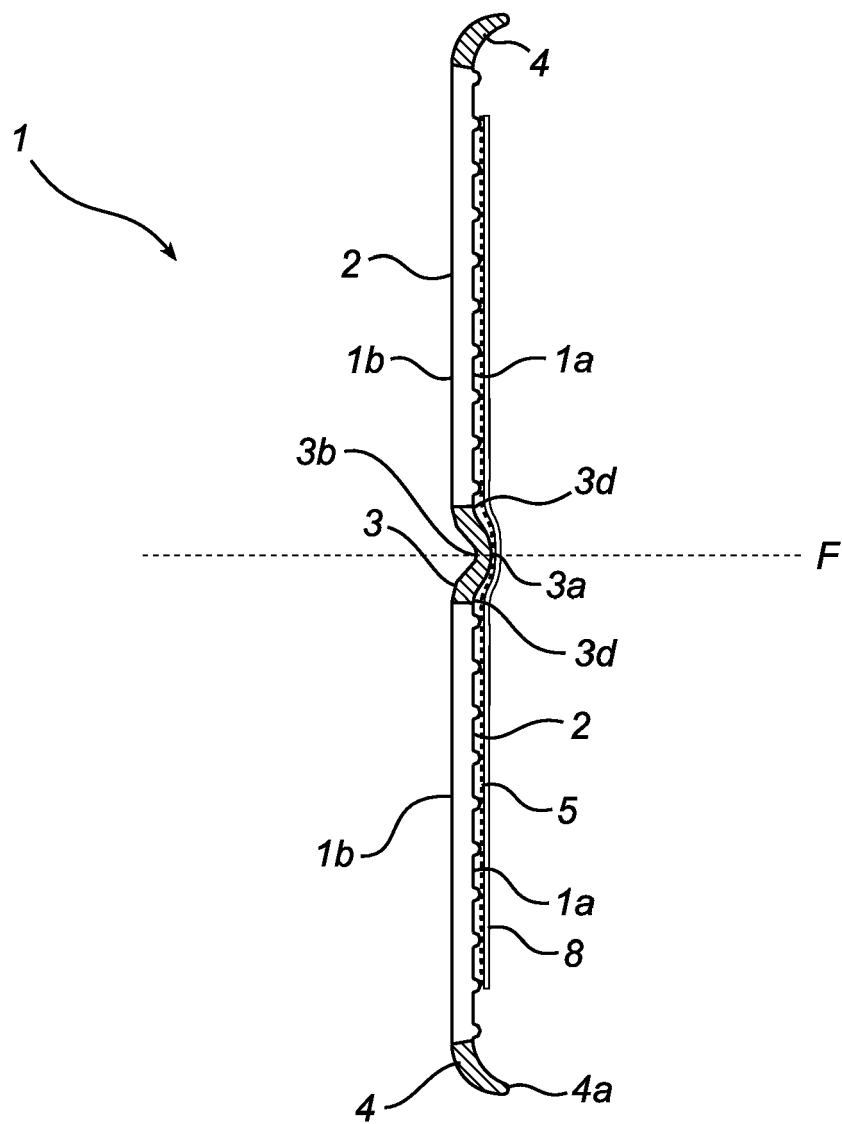


Fig. 1

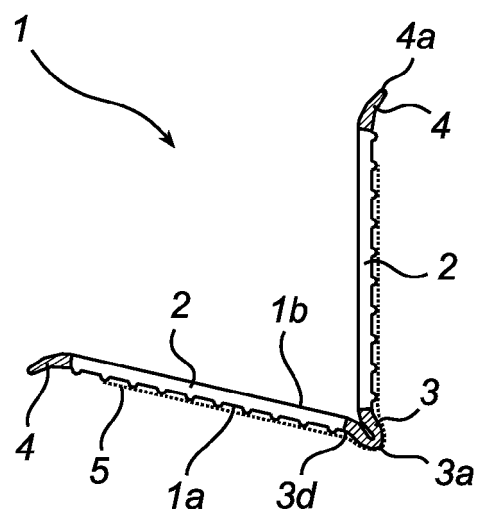


Fig. 2

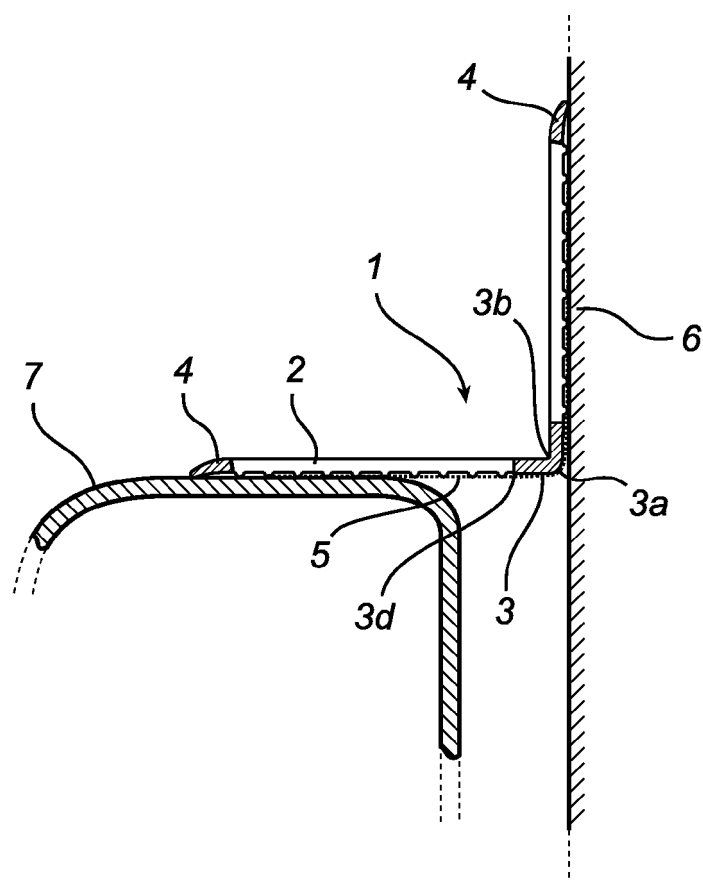


Fig. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 15 0476

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 204 376 A (CALVERT SCOTT A [US]) 27 May 1980 (1980-05-27) * column 3, line 16 - line 38; figure 1 *	1-9	INV. A47K3/00
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D,A	DE 10 2004 003823 A1 (REUSCHE HOLGER [DE]) 22 December 2005 (2005-12-22) * figure 1 *	1,3	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47K
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		30 June 2008	Zuurveld, Gerben
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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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 15 0476

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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30-06-2008

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REFERENCES CITED IN THE DESCRIPTION

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- GB 2136288 A [0005]