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(71) Applicant *(for all designated States except US)*: **SAINT-GOBAIN ISOVER** [FR/FR]; Les Miroirs, 18, avenue d'Alsace, F-92400 Courbevoie (FR).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **BOGE, Birgit** [DE/DE]; Tannhäuserring 174, 68199 Mannheim (DE). **GRÖNER, Wilhelm** [DE/DE]; Lorscher Strasse 13, 69198 Schriesheim (DE).

(74) Agents: **HERRMANN-TRENTEPOHL, W.** et al.; Forstenrieder Allee 59, 81476 München (DE).

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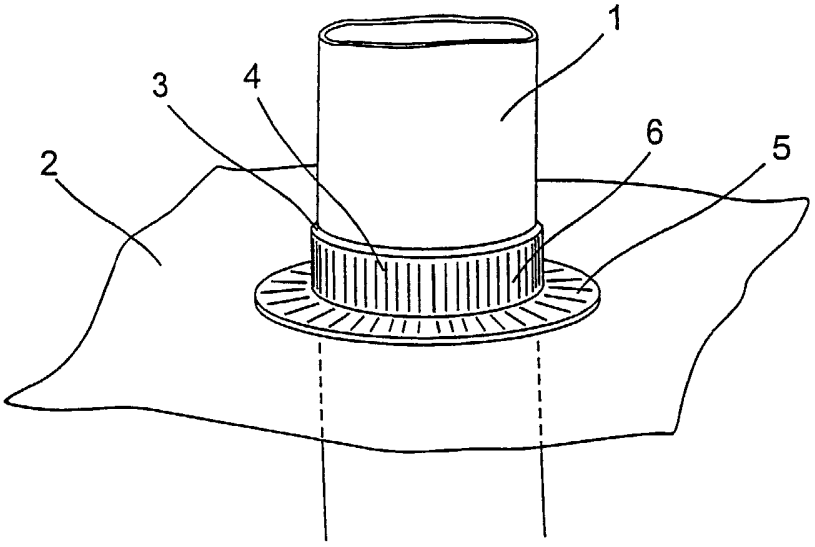
(54) Title: SELF-ADHESIVE SEALING TAPE FOR SEALING THE PASSAGES OF CONSTRUCTION UNITS THROUGH PLASTIC FOILS LINING ROOFS



(57) Abstract: A self-adhesive flexible sealing tape, especially on a butyl or acrylic base, possibly a butyl rubber base, intended for sealing purposes and so designed that both the sealing tape and the carrier foil applied to the sealing tape are capable of being stretched, thus enabling the carrier tape to follow the stretching state of the sealing tape.

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Self-adhesive sealing tape for sealing the passages of construction units through plastic foils lining roofs

The present invention concerns a self-adhesive sealing tape in accordance with the preamble of Claim 1 hereinbelow.

It is well known that roofs, especially pitched roofs, but also the walls of buildings are thermally insulated by means of the application of mineral wool products or other heat insulation materials between rafters and/or beams. When this is done, it is generally necessary to cover these materials with a plastic foil to act as a vapour barrier and constitute an air-tight covering. On the other hand, local passages have also to be provided in order to permit leads, cables and pipes to pass through the foil. It is therefore necessary for such passages of pipes through vapour barrier foils or roofing felts to be appropriately sealed. It is a common practice to use adhesive or sealing tapes for this purpose.

Such sealing tapes are usually formed on a plastic base, especially made of plastic material on a butyl rubber base. This material confers self-adhesive properties upon the sealing tape, so that for the purposes of storage and use a foil is normally applied to overlie and cover the sealing tape on both sides. Known sealing tapes for making good the passages of pipes through vapour barrier foils are thus covered by a plastic and in most cases transparent foil applied to one side, while the other and opposite side of the tape is covered by a peel-off foil that is perforated at the centre, siliconized transfer paper for example, which prevents successive layers of the tape from sticking to each other when the tape is wound onto a roll. When the sealing tape is used, it is generally folded along the middle and one half of the peel-off foil is then removed; thereafter the longitudinal half from which the foil has been removed is manually formed into a rosette, the other half of the peel-off foil is removed and the sealing tape is then made to

adhere to the pipe with this longitudinal half. To this end the user will previously have prepared a section of the sealing tape having a length corresponding to the pipe circumference airwaference. At the time the tape is made to stick to the pipe, the previously formed rosette is also pressed against the vapour barrier foil and made to adhere to it. Since the longitudinal half of the tape that does not stick to the barrel jacket of the pipe extends in a more or less radial direction therefrom, this means that the area of contact with the vapour barrier foil is larger than the original area of the tape, so that the tape must first be stretched in this area. This is possible when the chosen sealing tape is made of plastic material on a butyl rubber base, because these tapes have a substantial component of plastic material, so that the sealing tape, following the radial extension, can be appropriately stretched in the radial direction. In actual practice, however, the known sealing tapes are associated with the drawback that, given the multi-layer structure of the sealing tape, which consists of carrier and foil, the stretching is adversely affected by the existence of tensions and deformations, which have the effect that the adhesion of the sealing tape to the vapour barrier foil and the barrel jacket of the pipe may come apart at least over part of the area. This is due, above all, to the fact that especially the plastic foil will tend to warp and form folds, so that the deformable sealing tape will become detached from the vapour barrier foil in at least some sections. Local leaks may therefore form, especially in the area of such warps and folds, so that the vapour barrier will no longer be airtight. Furthermore, the crumpled and/or folded sealing tape will give rise to a poor appearance and convey the impression of poor and careless workmanship in creating and sealing the passage of the pipe through the vapour barrier foil. Lastly, the adhesive capacity of the longitudinal half formed into a rosette will be adversely affected when this longitudinal half without a peel-off foil is manually stretched.

The present invention therefore sets out to introduce some simple measures that will render possible the reliable sealing of the passages of pipes through vapour barrier foils and the like, while yet keeping the actual application extremely simple.

According to the invention, this aim is achieved by means of the features set out in the characterizing part of Claim 1 hereinbelow, while useful further developments of the invention are characterized by the features described in the various dependent claims.

In accordance with the invention, given a sealing tape that is formed on a butyl or an acrylic base, especially on a butyl rubber base, said base being covered on one side by a plastic foil that serves as carrier foil and on the opposite side by a peel-off foil, said carrier foil being made to be stretchable and this in such a manner as to enable the carrier foil to follow the enlargement and/or stretching of the section of the sealing tape that – in order to make said sealing tape adhere to the flat vapour barrier foil – is bent in the manner of a flange, that is to say, the carrier foil is enabled to follow the stretched state that has to be attained if the sealing tape is to adhere to the flat vapour barrier foil and, what is more, will permanently maintain this adhesion. This prevents the warping of the carrier foil and the formation of folds and this, in turn, not only confers an unobjectionable appearance upon the sealed passage, but also prevents the stretched sealing tape from becoming detached from the vapour barrier foil, thus preventing even a partial and autonomous peeling in the absence of external influences. In a very simple manner it thus becomes possible to assure a reliable and permanent seal even in the case of very complex pipe passages.

To this end it will be helpful not only if a tape with plastoelastic characteristics and a high plastic component is used as sealing tape and, further, if the stretching capacity of the carrier foil matches the stretching capacity of the sealing tape, especially if it is made equal to it.

Preferably the stretchable carrier foil will be made of plastic material, especially transparent plastic material and, preferably, of polyamide.

In a particularly appropriate embodiment of the invention the carrier foil is designed for a predetermined thickness, which will be in the range between 15 and 30 μm, especially between 17 and 20 μm, and preferably of the order of 20 μm. Such a design of

the protective foil assures that the stretching capacity of the protective foil will be in line will be in line with the stretching capacity of the sealing tape, so that it will permanently follow the latter when it is radially enlarged while it is being made to adhere to the vapour barrier foil. Such a design makes it possible for the adhesive or sealing tape to be appropriately stretchable even when it is stretched in combination with the carrier foil on one side and will not tear even when it is stretched up 100%. Preferably sealing tape and carrier foil will here be designed for a stretching capacity in the range between 50 and 100%, especially between 70 and 80%. To this end it may be advantageous if the carrier foil is at least half-sidedly crêped in the longitudinal direction.

It is of practical importance to provide the peel-off foil of the sealing tape and/or the carrier foil with perforations or appropriate subdivisions in the longitudinal direction of the sealing tape, because this will make it possible for the sealing tape to be folded and appropriately pre-stretched on one side. The sealing tape does not have to be stretched when it is made to adhere to the pipe jacket, but this becomes necessary in the case of the remaining part of the sealing tape, which is bent away from the pipe jacket in the manner of a flange, and that is the reason why a one-sided elongation or pre-stretching of the sealing tape is advantageous.

In an advantageous embodiment of the invention the sealing tape is provided with a carrier foil made of polyamide that has a coating on a butyl or acrylic base, especially a butyl rubber base. In yet another embodiment the sealing tape can be provided with reinforcement inlays to increase its tear resistance. The incorporation of checker-pattern inserts will be particularly suitable for this purpose. To this end the material and the form of the checker pattern will be so chosen as to enable it to follow the stretching process.

In a practical and advantageous embodiment the sealing tape will be designed to have a thickness in the range between about 1.5 and 3 mm, and preferably about 2 mm.

It is now proposed to describe a preferred embodiment of the invention with the help of the single figure attached hereto, which, albeit in a purely schematic form, illustrates a pipe passage through a vapour barrier foil.

In this figure the reference number 1 designates a cylindrical pipe that passes through a vapour barrier foil 2, the passage being sealed and rendered air-tight by means of a sealing tape 3. The longitudinal half of sealing tape 3 designated by the reference number 4 is laid around the barrel jacket of the pipe 1 and made to adhere firmly to said barrel jacket, while the lower longitudinal half of the tape, which in the figure is designated by 5, is bent outwards from the barrel jacket in the manner of a flange and adheres to the vapour barrier foil 2. To this end it is evident that the lower longitudinal half 5 must be appropriately enlarged in order to be able to follow sealing tape section 4, which is laid around the barrel jacket of the pipe, and the radial stretching outwards and away from the barrel jacket. In this case the outer surface of sealing tape 3 that can be seen in the figure is covered by a carrier foil 6, which will be advantageously made of polyamide and, more particularly, transparent polyamide and be designed to have a thickness of 20 μm. The sealing tape itself has a thickness of about 2 mm.

For the purposes of practical use the sealing tape is made available wound onto a roll, where the side of the sealing tape opposite to the carrier foil is covered by a peel-off foil to protect its adhesive surface, though this peel-off foil is not shown in the figure. When the sealing tape is actually to be applied, the user first detaches a length of sealing tape corresponding to the circumference of pipe 1 and then folds it more or less in the area of the centre of the sealing tape, so that the part indicated in the figure by the reference number 4 is made to adhere to the barrel jacket and the folded part 5 is made to adhere the vapour barrier foil 2.

Claims

1. A self-adhesive flexible sealing tape, especially on a butyl or acrylic base, possibly a butyl rubber base or similar, intended for sealing purposes, especially for sealing the passages of building components through plastic foils laid against roofs and similar, especially for sealing the passages of pipes and cables through vapour barrier foils, where the sealing tape is covered on one side by a peel-off strip to protect its adhesive surface and on the opposite side by a carrier foil, **characterized in that** the sealing tape and the carrier foil are designed to be stretchable, and this in such a way that the carrier foil can to all intents and purposes permanently follow the stretched condition of the sealing tape that is necessary when the sealing tape is to be made to adhere to the vapour barrier foil, which in the mounted state is usually tensioned as a flat surface.
2. A sealing tape in accordance with Claim 1, **characterized in that** it makes use of a sealing tape with plastoelastic behaviour, especially a sealing tape with a high plastic component.
3. A sealing tape in accordance with Claim 1 or Claim 2, **characterized in that** the stretching capacity of the carrier foil is adapted to the stretching capacity of the sealing tape, especially made equal to it.
4. A sealing tape in accordance with anyone of the preceding claims, **characterized in that** the stretchable carrier foil is made of plastic material.
5. A sealing tape in accordance with Claim 4, characterized in that the carrier foil is made of polyethylene, especially polyamide.
6. A sealing tape in accordance with anyone of the preceding claims, **characterized in that** the carrier foil has a thickness in the range between 15 and 30 μm, especially between 17 and 22 μm, and preferably of about 20 μm.
7. A sealing tape in accordance with anyone of the preceding claims, **characterized in that** the sealing tape and the carrier foil are designed for a stretching capacity in the range between 50 and 100% and especially between 70 and 80%.

8. A sealing tape in accordance with anyone of the preceding claims, **characterized in that** the peel-off foil is perforated or subdivided in the longitudinal direction, and this in such a way as to make it possible for the sealing tape to be pre-stretched on one side.
9. A sealing tape in accordance with anyone of the preceding claims, **characterized in that** at least half the side of the carrier tape in the longitudinal direction is crêped.
10. A sealing tape in accordance with anyone of the preceding claims, **characterized in that** the sealing tape is provided with reinforcing insets, especially a checker pattern, to increase its tear resistance.
11. A sealing tape in accordance with anyone of the preceding claims, **characterized in that** the sealing tape has a thickness in the range between 0.5 and 3 mm, preferably a thickness of about 2 mm.

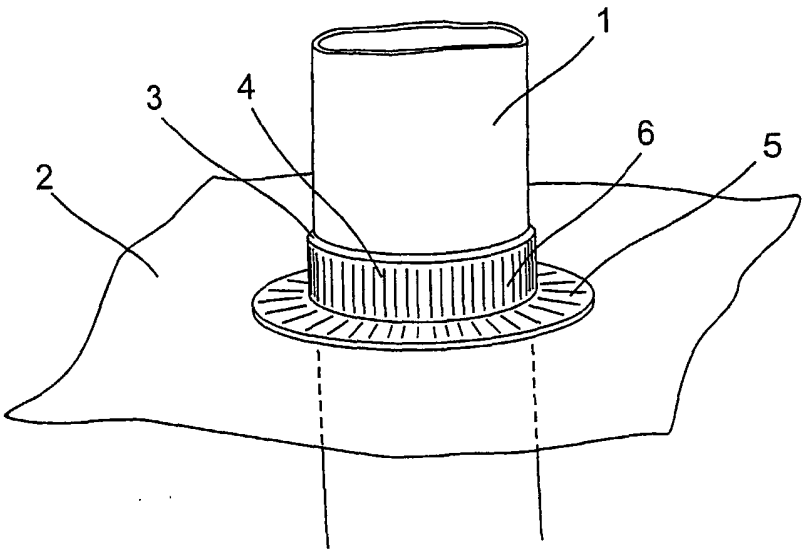

Fig. 1

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C09J E04D F16L H02G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

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Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
7 February 2003	24/02/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Schlicke, B

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
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