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(54) **Panel for a sectional door, sectional door, and use of a profile on a sectional door**

Tafel für ein Sektionaltor, Sektionaltor und Verwendung eines Profils an einem Sektionaltor

Panneau pour porte sectionnelle, porte sectionnelle et utilisation d'un profil sur une porte sectionnelle

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Description

[0001] The present invention relates to a panel for a sectional door, a sectional door, and the use of a profile.

[0002] More specifically the invention concerns sectional doors, i.e. doors with a number of horizontal panels that can be pulled upwards to open the door, and which can be let or pushed downwards again to close the door.

[0003] Such sectional doors are generally designed and/or installed such that if the panels are opened from the closed position, they are pulled upwards, but also move slightly in the direction of the inside of the door, i. e. in the direction of the space that is closed off by the door. This can be achieved for example by sloping the plane in which the panels are located slightly towards the inside when the sectional door is closed.

[0004] Such a door is closed in the reverse way, whereby during the majority of the closing movement the panels move with relatively little friction, and during the last stage of closing they are pushed somewhat towards the outside, against a seal provided to this end.

[0005] This can be caused by gravity in combination with the design of the door, and acts to prevent or reduce friction of the components of the door against one another, for example the panels against seals or guide wheels against guide rails, so that these components are subject to less wear, and less force is needed to open and close the door.

[0006] However, this does not work with doors provided with a seal that acts against the side and/or top of the panels, for example a rubber strip that is fastened to the frame of the door and which uses the side of the panels as an end stop in order to be able to properly seal a closed door.

[0007] Such a sectional door is described for example in EP2426309, and can be applied to obtain a very good insulation value.

[0008] In this case the side edges and/or top edges of the panels slides along the seal, resulting in wear and/or a risk of detachment of the seals, which leads to higher costs and a poorer seal.

[0009] As a result the panels of the door also move less flexibly, such that a greater force is needed to operate them.

[0010] The purpose of the present invention is to provide a solution to at least one of the aforementioned and other disadvantages, by providing a panel for a sectional door, whereby one or both side edges have a surface that forms an angle with the outside and inside of the panel, whereby the included angle of this surface with the outside is an obtuse angle and the included angle of this surface with the inside is an acute angle.

[0011] This has the advantage that such a panel can be used in a sectional door with a seal on the sides of the panels and on the top of the top panel, whereby the panels easily come away from this seal during opening and thus can continue further movement with relatively little friction.

[0012] This has further advantages that a limited force is required for opening, and that wear on the seal and panels is reduced.

[0013] Because such a panel is pushed against the seal during the last phase of a closing movement of a sectional door, on account of the said surface that makes an acute angle with the inside of the panel, a better fitting seal is obtained in any case.

[0014] The outside and inside of the panels are hereby the sides of the panel that are respectively oriented towards the outside and inside of the building in which a sectional door is used with such panels. The side edges are the transverse ends of the panels.

[0015] Preferably the acute angle is between 45° and 85° and even more preferably between 60° and 85°.

[0016] In a preferred embodiment the panel comprises a panel body and profiles at each of the side edges and the top edge of the panel body, whereby the said surface is formed by the profile.

[0017] This is a practical way to manufacture such a profile.

[0018] In a further preferred embodiment the panel body is hollow with one or more openings on the side edges, whereby the profile is of such a size and is affixed such that the profile closes the openings.

[0019] A hollow panel body, whereby the cavity of this panel body can be filled with an insulating product, must be closed off, so that no air transport can take place via the cavity of the panel between the inside and outside of the building in which the panel is intended to be used. Traditionally this is done with a cap.

[0020] In the preferred embodiment described the profile takes over the function of this cap, so that a separate cap is no longer necessary.

[0021] The invention also concerns a sectional door that comprises at least one panel as described above.

[0022] In a preferred embodiment this sectional door also has at least one seal that seals off the sectional door in a closed position, whereby the dimensions of the components of the door are such that in a closed position of the sectional door the said surface or the said surfaces acts or act as an end stop for the seal.

[0023] Such a sectional has the advantage of reduced wear of a side seal and a light operation, as explained above.

[0024] Furthermore the invention also concerns the use of an open profile on the side edge of a panel of a sectional door, according to claim 13, whereby the profile is a profile with a base and two parallel flanks, whereby the base and the flanks of the profile are straight and the angle included by the outer surfaces of the base and a flank is acute, and preferably lies between 45° and 85° at the side edges and if applicable the top edge of a panel of a sectional door, whereby the base of the profile forms an end stop for a seal of the sectional door in the closed position.

[0025] With the intention of better showing the characteristics of the invention, a preferred embodiment of a

sectional door according to the invention is described hereinafter by way of an example, without any limiting nature, with reference to the accompanying drawings, wherein:

Figure 1 schematically shows a perspective view of an opening in a wall that is provided with a sectional door according to the invention that is provided with panels according to the invention; and
Figure 2 shows a cross-section according to line II-II when the sectional door is closed; and
Figure 3 shows the same cross-section as figure 2, but in a different position of use of the sectional door.
Figure 4 shows a cross-section according to line IV-IV when the sectional door is closed; and
Figure 5 shows the same cross-section as figure 4, but in a different position of use of the sectional door.

[0026] The sectional door 1 in figures 1 to 5 closes an opening between the inside and outside of a building and essentially consists of a frame 2 and a number, in this case four, of panels 3 connected on top of one another.

[0027] The bottom three panels 3, as shown in figures 2 and 3, have an inside 4, an outside 5 and two side edges 6. They consist of hollow panel bodies 7 that are provided on both sides with profiles 8 that form the side edges 6 of the panel. The profiles 8 are affixed over the sides of the panel bodies 7 such that they close off the cavity 9 in a panel body 7.

[0028] This done for example by bonding the profiles 8 over the entire surface with which they are in contact with the panel bodies 7, and by filling up the remaining openings, for example on the top and bottom of a panel. The cavity 9 is provided with insulating material, for example insulating foam.

[0029] It can also be useful here to saw off the panel bodies 7 at their sides obliquely to obtain a better fit with the profiles 9.

[0030] The thickness of the panel bodies 7 is D.

[0031] The profiles 8 are open profiles, i.e. their cross section is approximately U-shaped or hook shaped, and are made from polyester. They have a straight base 10 and two straight parallel flanks, i.e. a first straight flank 11, that is on the inside 4 of the panel, and a second straight flank 12 that is on the outside 5 of the panel. The distance A between the two flanks A is equal to the thickness D of a panel body 7.

[0032] The outer surface 13 of the base 10 and the outer surface 14 of the first flank 11 make an included angle α with one another of approx. 80°. As the first flank 11 runs parallel to the inside 4 of the panels 3, the outer surface 13 of the base 10 makes the same angle α with the inside 4 of the panels 3.

[0033] The top panel 3, as shown in figures 4 and 5, also has a profile 8 in addition to its top edge, so that a top surface 16 of the panel 3 is formed by the outer surface 13 of the base 10 of this profile 8.

[0034] In this case this is a profile 8 whose outer surface 13 of the base 10 and the outer surface 14 of the first flank 11 make an included angle β with one another of approx. 75°.

[0035] Four seals are fastened to the frame 2 of the sectional door 1, constructed as rubber strips, i.e. a first seal 17 and second seal 18, that are on the side of the sectional door 1, and a third seal 19 and a fourth seal 20 that are on the top of the sectional door 1. The second seal 18 is hereby constructed as a seal with three ribs, and the fourth seal 20 is a double construction.

[0036] The first seal 17 preferably connects to the third seal 19 and the second seal 18 preferably connects to the fourth seal 20, to form two sealing arches for a good airtight fit of the sectional door 1 in the closed position.

[0037] With the sectional door 1 in the closed position, as shown in figures 2 and 4, the first and third seals 17 and 19 are in contact with the outside of the panels 3, in this case more specifically with the second flank 12 of the profile 8, and the second and fourth seal 18 and 20 are in contact with the outer surface 13 of the base 10 of the profile 8.

[0038] The second flank 12, respectively on the side edges 6 of the panels 3 and on the top edge 15 of the top panel 3, thus forms end stops for the first and third seals 17 and 19 respectively.

[0039] The outer surface 13 of the base 10, respectively on the side edges 6 of the panels 3 and on the top edge 15 of the top panel 3, forms end stops for the second and fourth seals 18 and 20 respectively.

[0040] The opening of the sectional door 1 has the following consequences, that are described with the aid of figures 2 to 5.

[0041] The normally closed position of the sectional door is as described above, and as shown in figures 2 and 4. As soon as an upward force is exerted on the panels 3, they move upwards. As a result of the design of the sectional door a horizontal movement shown by arrow P is also brought about, such that, as shown in figures 3 and 5, the panels 3 come away from the seals 17 to 20.

[0042] The panels 3 can now be opened further upwards in the conventional way, without further excessive friction or risk of damage or wear to the seals 17 to 20, so that the sectional door 1 is opened.

[0043] The present invention is by no means limited to the embodiment described as an example and shown in the drawings, but a panel and sectional door according to the invention can be realised in all kinds of variants and in different ways within the scope of the claims, without departing from the scope of the invention.

Claims

1. Panel (3) for a sectional door (1), **characterised in that** one or both side edges (6) of the panel have a surface (13) and this surface (13) forms an angle with the outside (5) and inside (4) of the panel (3),

whereby the included angle of this surface (13) with the outside (5) is an obtuse angle and the included angle (α, β) of this surface (13) with the inside (4) is an acute angle.

2. Panel according to claim 1, **characterised in that** no seal is mounted on the surface (13, 16).

3. Panel (3) according to claim 1 or 2, **characterised in that** both side edges (6) and the top edge (15) of the panel (3) have a surface (13, 16) that forms an angle with the outside (5) and inside (4) of the panel (3), whereby the included angle of this surface (13, 16) with the outside (5) is an obtuse angle and the included angle (α, β) of this surface (13, 16) with the inside (4) is an acute angle.

4. Panel according to claim any one of the previous claims, **characterised in that** the acute angle (α, β) is between 45° and 85°.

5. Panel according to any one of the previous claims, **characterised in that** the panel (3) comprises a panel body (7) and a profile (8) on the sides (15) of the panel body (7), whereby the said surface (13) is formed by the profile (8).

6. Panel according to claim 5, **characterised in that** the profile (8) is an open profile (8) with a base (10) and two parallel flanks (11, 12) that is affixed with its open side over the panel body (7), whereby the said surface (13) is formed by the base (10).

7. Panel according to claim 5 or 6, **characterised in that** the base (10) and the flanks (11,12) of the profile are straight, whereby the said surface is formed by the outer surface (13) of the base (10) and whereby the included angle (α, β) of the outer surfaces (13, 14) of the base (10) and a flank (11) is equal to the acute angle (α, β), whereby this flank (11) is affixed on the inside (4) of the panel (3).

8. Panel according to claim 6 of 7, **characterised in that** the distance (A) between the flanks (11, 12) corresponds to the thickness (D) of the panel body (7).

9. Sectional door (1) that comprises at least one panel (3) according to any one of the previous claims.

10. Sectional door according to claim 9, **characterised in that** it has at least one seal (18, 20) that seals off the sectional door (1) in a closed position, whereby the dimensions of the components of the sectional door (1) are such that in a closed position of the sectional door (1) the said surface or surfaces (13, 16) acts or act as an end stop for at least one seal (18, 20).

11. Sectional door according to claim 9 or 10, **characterised in that** it is provided with two or more panels (3), whereby the top panel (3) is a panel according to claim 3 and a panel (3) located underneath is a panel (3) according to any one of the claims 1 to 8.

12. Sectional door according to any one of the claims 9 to 11-, **characterised in that** it is designed and/or installed such that during the first phase of the opening of a closed sectional door (1) the panels (3) move both vertically and horizontally inwards.

13. Use of an open profile (8) on the side edge (6) of a panel (3) of a sectional door (1), whereby the base (10) of the profile forms an end stop for a seal (18, 20) of the sectional door (1) in a closed position, and whereby the profile is a profile with a base (10) and two parallel flanks (11,12), whereby the base (10) and the flanks (10) are straight and the included angle (α, β) by the outer surfaces (13,14) of the base (10) and a flank (11) is acute.

14. Use according to claim 13, **characterised in that** the included acute angle (α, β) is between 45° and 85°.

15. Use according to claim 13 or 14, **characterised in that** the panel (3) comprises a hollow panel body (7), whereby the profile (8) closes off the hollow panel body (7).

Patentansprüche

1. Paneel (3) für ein Sektionaltor (1), **dadurch gekennzeichnet, dass** eine oder beide Seitenkanten (6) des Paneels eine Oberfläche (13) aufweisen und diese Oberfläche (13) einen Winkel mit der Außenseite (5) und Innenseite (4) des Paneels (3) bildet, wobei der eingeschlossene Winkel dieser Oberfläche (13) mit der Außenseite (5) ein stumpfer Winkel ist und der eingeschlossene Winkel (α, β) dieser Oberfläche (13) mit der Innenseite (4) ein spitzer Winkel ist.

2. Paneel nach Anspruch 1, **dadurch gekennzeichnet, dass** keine Dichtung an der Oberfläche (13, 16) montiert ist.

3. Paneel (3) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** beide Seitenkanten (6) und die Oberkante (15) des Paneels (3) eine Oberfläche (13, 16) aufweisen, die einen Winkel mit der Außenseite (5) und Innenseite (4) des Paneels (3) bildet, wobei der eingeschlossene Winkel dieser Oberfläche (13, 16) mit der Außenseite (5) ein stumpfer Winkel ist und der eingeschlossene Dinkel (α, β) dieser Oberfläche (13, 16) mit der Innenseite (4) ein spitzer Winkel ist.

4. Paneel nach einem der vorgenannten Ansprüche, **dadurch gekennzeichnet, dass** der spitze Winkel (α, β) zwischen 45° und 85° liegt.

5. Paneel nach einem der vorgenannten Ansprüche, **dadurch gekennzeichnet, dass** das Paneel (3) einen Paneelkörper (7) und ein Profil (8) an den Seiten (15) des Paneelkörpers (7) umfasst, wobei die besagte Oberfläche (13) durch das Profil (8) gebildet wird.

6. Paneel nach Anspruch 5, **dadurch gekennzeichnet, dass** das Profil (8) ein offenes Profil (8) mit einer Basis (10) und zwei parallelen Flanken (11, 12) ist, das mit seiner offenen Seite über dem Paneelkörper (7) angebracht ist, wobei die besagte Oberfläche (13) durch die Basis (10) gebildet wird.

7. Paneel nach Anspruch 5 oder 6, **dadurch gekennzeichnet, dass** die Basis (10) und die Flanken (11, 12) des Profils gerade sind, wobei die besagte Oberfläche durch die Außenfläche (13) der Basis (10) gebildet wird, und wobei der eingeschlossene Winkel (α, β) der Außenflächen (13, 14) der Basis (10) und einer Flanke (11) gleich dem spitzen Winkel (α, β) ist, wobei diese Flanke (11) an der Innenseite (4) des Paneels (3) angebracht ist.

8. Paneel nach Anspruch 6 oder 7, **dadurch gekennzeichnet, dass** der Abstand (A) zwischen den Flanken (11, 12) der Dicke (D) des Paneelkörpers (7) entspricht.

9. Sektionaltor (1), das mindestens ein Paneel (3) nach einem der vorgenannten Ansprüche umfasst.

10. Sektionaltor nach Anspruch 9, **dadurch gekennzeichnet, dass** es mindestens eine Dichtung (18, 20) aufweist, welche das Sektionältor (1) in einer geschlossenen Position abdichtet, wobei die Abmessungen der Einzelteile des Sektionaltors (1) derart sind, dass in einer geschlossenen Position des Sektionaltors (1) die besagte Oberfläche oder Oberflächen (13, 16) als Anschlag für mindestens eine Dichtung (18, 20) dient bzw. dienen.

11. Sektionaltor nach Anspruch 9 oder 10, **dadurch gekennzeichnet, dass** es mit zwei oder mehr Paneelen (3) versehen ist, wobei das oberste Paneel (3) ein Paneel nach Anspruch 3 ist und ein darunter befindliches Paneel (3) ein Paneel (3) nach einem der Ansprüche 1 bis 8 ist.

12. Sektionaltor nach einem der Ansprüche 9 bis 11, **dadurch gekennzeichnet, dass** es so entworfen und/oder installiert ist, dass während der ersten Phase des Öffnens eines geschlossenen Sektionaltors (1) die Paneele (3) sich sowohl vertikal als auch horizontal einwärts bewegen.

13. Verwendung eines offenen Profils (8) an der Seitenkante (6) eines Paneels (3) eines Sektionaltors (1), wobei die Basis (10) des Profils einen Anschlag für eine Dichtung (18, 20) des Sektionaltors (1) in einer geschlossenen Position bildet und wobei das Profil ein Profil mit einer Basis (10) und zwei parallelen Flanken (11, 12) ist, wobei die Basis (10) und die Flanken (10) gerade sind und der durch die Oberflächen (13, 14) der Basis (10) und einer Flanke (11) eingeschlossene Winkel (α, β) spitz ist.

14. Verwendung nach Anspruch 13, **dadurch gekennzeichnet, dass** der eingeschlossene spitze Winkel (α, β) zwischen 45° und 85° liegt.

15. Verwendung nach Anspruch 13 oder 14, **dadurch gekennzeichnet, dass** das Paneel (3) einen hohlen Paneelkörper (7) umfasst, wobei das Profil (8) den hohlen Paneelkörper (7) abschließt.

Revendications

1. Panneau (3) pour une porte en sections (1), **caractérisé en ce qu'**un bord latéral ou les deux bords latéraux (6) du panneau possèdent une surface (13) et cette surface (13) forme un angle avec le côté externe (5) et le côté interne (4) du panneau (3), l'angle inclus de cette surface (13) avec le côté externe (5) représentant un angle obtus et l'angle inclus (α, β) de cette surface (13) avec le côté interne (4) représentant un angle aigu.

2. Panneau selon la revendication 1, **caractérisé par** l'absence de joint d'étanchéité sur la surface (13, 16).

3. Panneau (3) selon la revendication 1 ou 2, **caractérisé en ce que** les deux bords latéraux (6) et le bord supérieur (15) du panneau (3) possèdent une surface (13, 16) qui forme un angle avec le côté externe (5) et le côté interne (4) du panneau (3), l'angle inclus de cette surface (13, 16) avec le côté externe (5) représentant un angle obtus et l'angle inclus (α, β) de cette surface (13, 16) avec le côté interne (4) représentant un angle aigu.

4. Panneau selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'angle aigu (α, β) se situe entre 45° et 85°.

5. Panneau selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le panneau (3) comprend un corps de panneau (7) et un profilé (8) sur les côtés (15) du corps de panneau (7), ladite surface (13) étant formée par le profilé (8).

6. Panneau selon la revendication 5, **caractérisé en ce que** le profilé (8) est un profilé ouvert (8) comprenant une base (10) et deux flancs parallèles (11, 12), qui est fixé avec son côté ouvert par-dessus le corps de panneau (7), ladite surface (13) étant formée par la base (10).

7. Panneau selon la revendication 5 ou 6, **caractérisé en ce que** la base (10) et les flancs (11, 12) du profilé sont droits, ladite surface étant formée par la surface externe (13) de la base (10) et l'angle inclus (α, β) des surfaces externes (13, 14) de la base (10) et d'un flanc (11) étant égal à l'angle inclus (α, β), ce flanc (11) étant fixé sur le côté interne (4) du panneau (3).

8. Panneau selon la revendication 6 ou 7, **caractérisé en ce que** la distance (A) entre les flancs (11, 12) correspond à l'épaisseur (D) du corps de panneau (7).

9. Porte en sections (1) qui comprend au moins panneau (3) selon l'une quelconque des revendications précédentes.

10. Porte en sections selon la revendication 9, **caractérisée en ce qu'**elle possède au moins un joint d'étanchéité (18, 20) qui ferme de manière étanche la porte en sections (1) dans une position fermée, les dimensions des composants de la porte en sections (1) étant telles que, dans une position fermée de la porte en sections (1), ladite ou lesdites surfaces (13, 16) font office d'arrêt terminal pour au moins un joint d'étanchéité (18, 20).

11. Porte en sections selon la revendication 9 ou 10, **caractérisée en ce qu'**elle est munie de deux panneaux (3) ou plus, le panneau supérieur (3) représentant un panneau selon la revendication 3 et un panneau (3) situé en dessous représentant un panneau (3) selon l'une quelconque des revendications 1 à 8.

12. Porte en sections selon l'une quelconque des revendications 9 à 11, **caractérisée en ce qu'**elle est conçue et/ou montée de telle sorte qu'au cours de la première phase de l'ouverture d'une porte en sections fermée (1), les panneaux (3) se déplacent à la fois en direction verticale et en direction horizontale vers l'intérieur.

13. Utilisation d'un profilé ouvert (8) sur le bord latéral (6) d'un panneau (3) d'une porte en sections (1), par laquelle la base (10) du profilé forme un arrêt terminal pour un joint d'étanchéité (18, 20) de la porte en sections (1) dans une position fermée, et par laquelle le profilé est un profilé comprenant une base (10) et deux flancs parallèles (11, 12), la base (10) et les flancs (11, 12) étant droits et l'angle inclus (α, β) formé par les surfaces externes (13, 14) de la base (10) et un flanc (11) étant aigu.

14. Utilisation selon la revendication 13, **caractérisée en ce que** l'angle aigu inclus (α, β) se situe entre 45° et 85°.

15. Utilisation selon la revendication 13 ou 14, **caractérisée en ce que** le panneau (3) comprend un corps de panneau creux (7), le profilé (8) fermant complètement le corps de panneau creux (7),

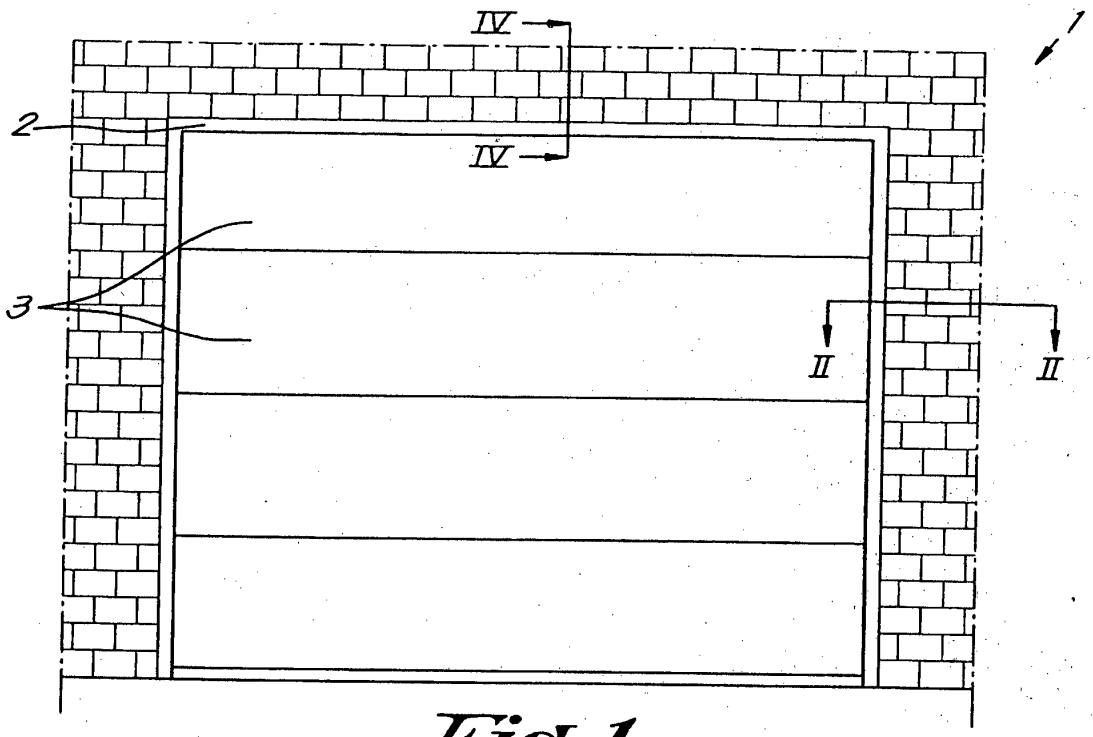


Fig. 1

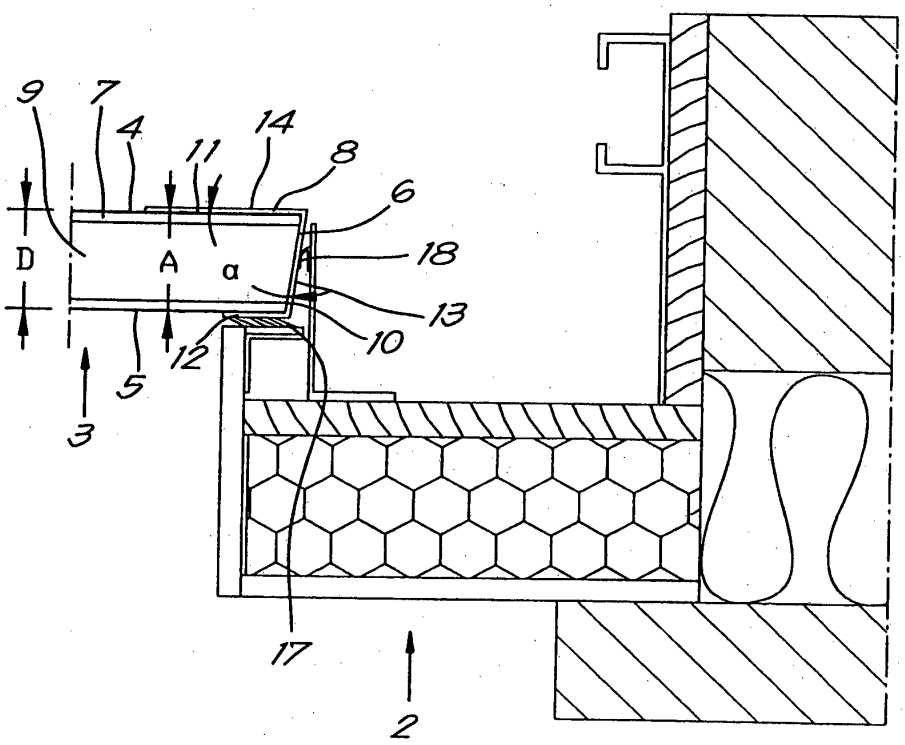


Fig. 2

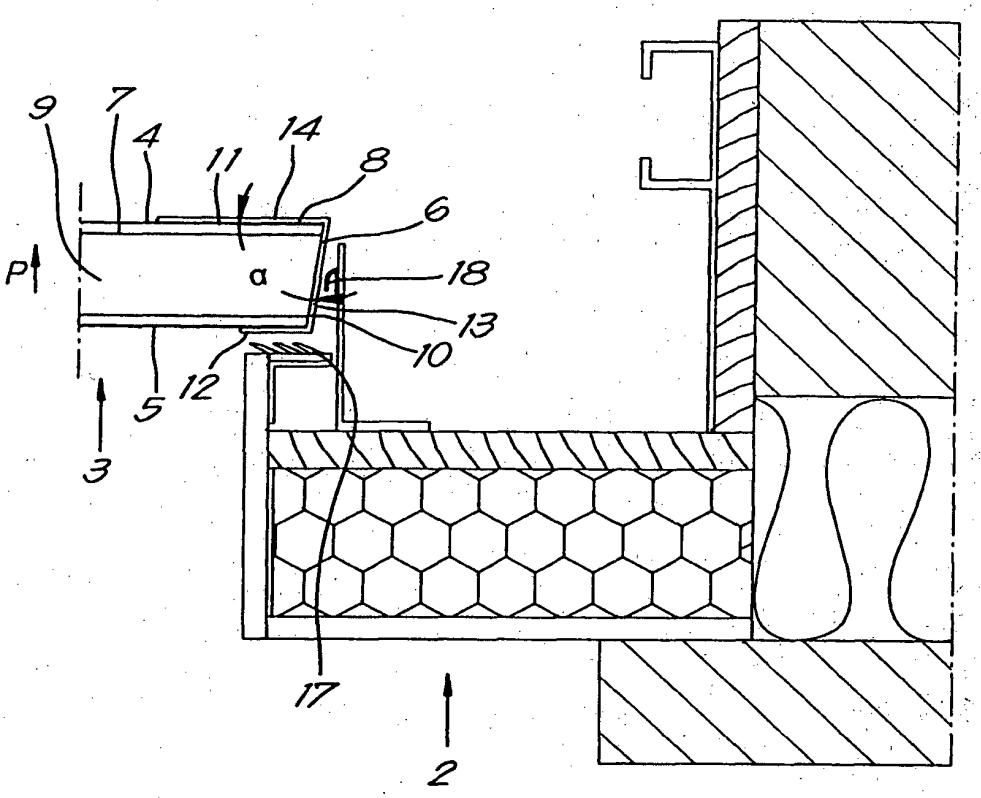


Fig.3

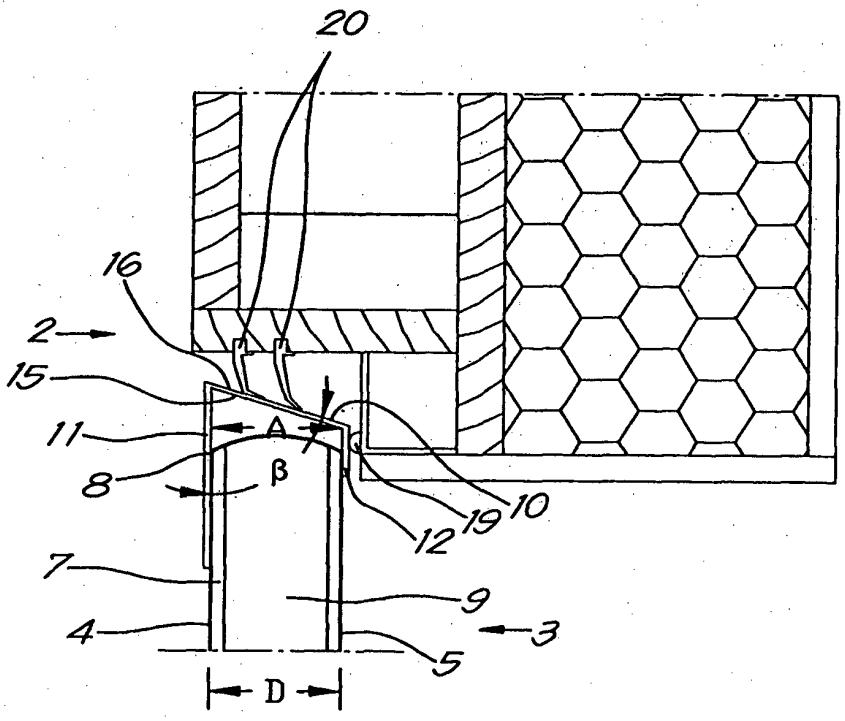


Fig.4

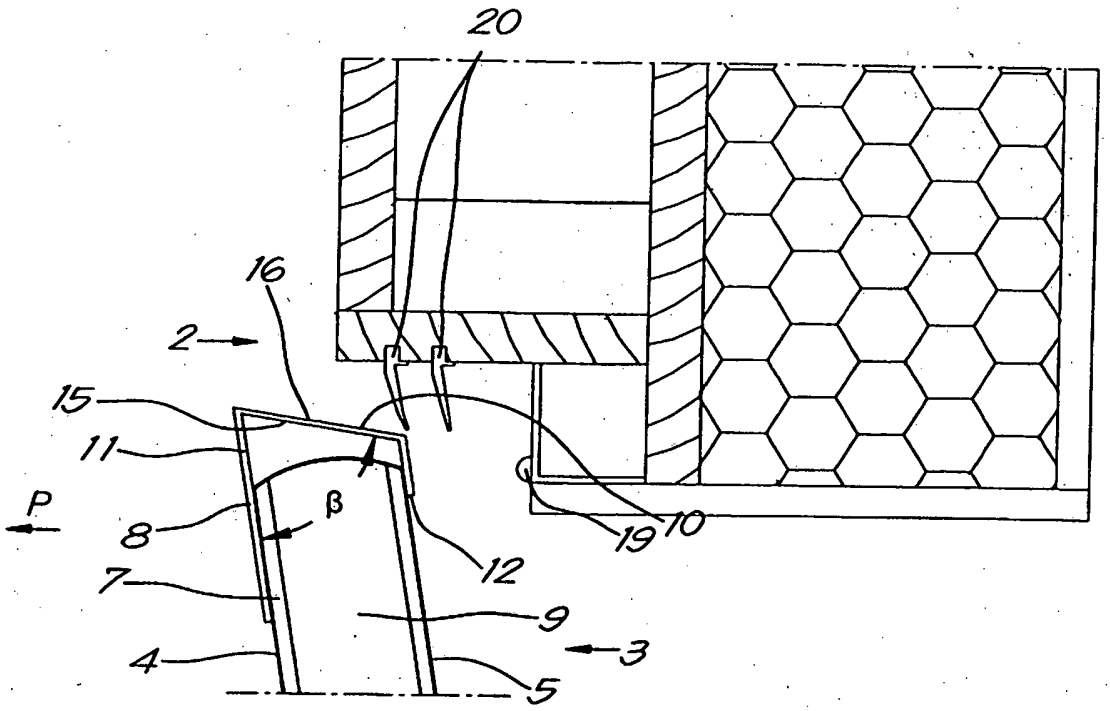


Fig.5

REFERENCES CITED IN THE DESCRIPTION

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