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(54) Security door comprising an observation window

(57) The present invention relates to a security door. The door comprises a first (3) and a second (4) sheet material. The sheet materials are arranged parallel to each other and at a distance apart, thus defining a door leaf with an inner space. A translucent part (7) is arranged between the first and the second sheet material. The translucent part covers a see-through opening (8, 9) arranged in the respective sheet material. A third sheet material (10) is arranged in the inner space and the translucent part is fastened in the door with the aid of the third sheet material.

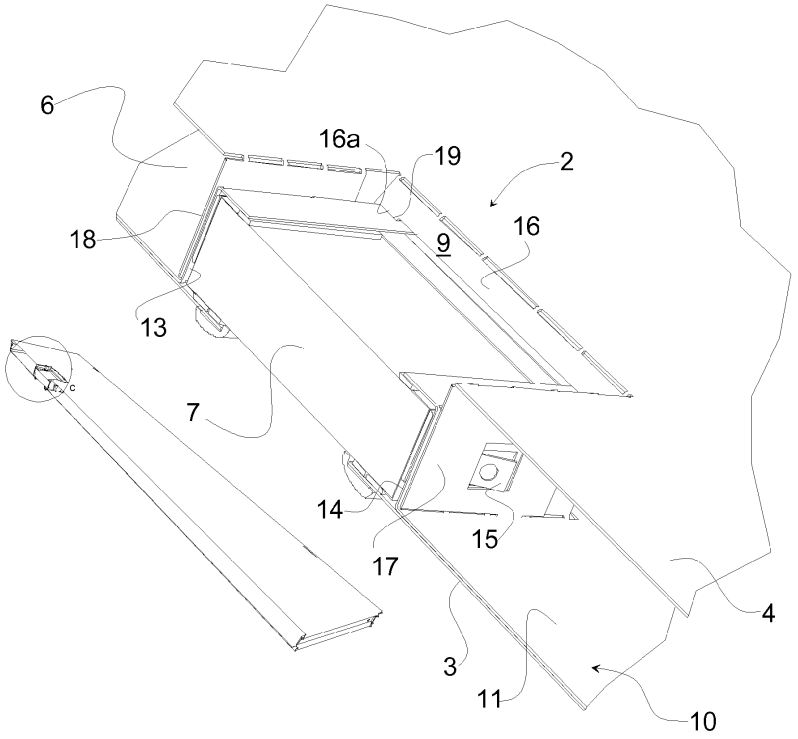

Fig. 4

EP 2 339 105 A2

Description

TECHNICAL FIELD

[0001] The present invention relates in general terms to security doors, and in particular to a security door having a translucent part. The invention further relates to a method for fastening a translucent part in such a security door.

BACKGROUND

[0002] Conventional security doors are often made up of two parallel main plates, or alternatively two main plate portions formed of a single plate, arranged at a distance apart such that an intervening space is formed. This intervening space is usually filled with an insulating and reinforcing material. The main plates can be seamed together or otherwise joined together at the door edges lying at right angles to the general plane of the door.

[0003] Should extra insulation and/or mechanical strength be desired in the door, a further flat plate can be placed on the inner side of one or both main plates. It is also known to provide such security doors with one or more sight openings or windows covered by a translucent sheet of security glass. In these known security doors, see-through openings are made in the main plates and the sheet of security glass is fixed to the main plates with metal fittings or the like which are fixed to the inner sides of the main plates.

[0004] One problem with such previously known fastenings of glass panes is firstly that strong fittings and joints are needed to withstand break-ins, which means that heat and sound insulation suffers due to the fact that the fastening fittings constitute undesirable heat-conducting and sound-conducting bridges between the two main plates. Another problem with previously known fastening solutions involving large-sized fastenings is that incorporated materials and assembly time impact negatively upon the total cost, since they comprise a relatively large number of parts, which call for laborious and time-consuming assembly work.

SUMMARY OF THE INVENTION

[0005] The object of the present invention is to provide a security door having a sight opening comprising a sheet of translucent material, such as security glass or the like, which solves the above-described problems. The invention especially relates to the manner in which the sheet of security glass is fastened to the door.

[0006] The security door according to the present invention comprises a first and a second sheet material. The sheet materials are arranged parallel to each other and at a distance apart, thus defining a door leaf with an inner space. A translucent part is arranged between the first and the second sheet material. The translucent part covers a see-through opening arranged in the respective sheet material. A third sheet material is arranged in the inner space and the translucent part is fastened in the door with the aid of the third sheet material.

[0007] According to a preferred embodiment, the third sheet material has a flat portion, with which the third sheet material is arranged in the inner space.

[0008] According to a preferred embodiment, the third sheet material is arranged on the inner side of the first sheet material.

[0009] According to a preferred embodiment, the third sheet material is arranged on the inner side of the second sheet material.

[0010] According to a preferred embodiment, the third sheet material is arranged in the inner space separate from the inner side of both the first and the second sheet material.

[0011] According to a further preferred embodiment, the third sheet material has at least two mutually opposing projecting parts, which extend in the direction away from the first sheet material towards the second sheet material.

[0012] According to a preferred embodiment, a see-through opening is arranged in the flat portion of the third sheet material.

[0013] According to a preferred embodiment, two projecting parts arranged on opposite sides of the see-through opening of the third sheet material and projecting from the flat portion in the direction of the second sheet material are provided, the translucent part being arranged between the projecting parts.

[0014] According to another preferred embodiment, the second sheet material comprises at least one projecting part arranged around the see-through opening of the second sheet material and projecting in the direction of the first sheet material. According to a preferred embodiment, the projecting parts of the third sheet material have bent tongues, which bear against the projecting parts of the second sheet material in order to effect engagement between the second and the third sheet material.

[0015] According to a preferred embodiment, the second sheet material has bent flanges, which are arranged at the see-through opening and which project into contact against the projecting parts of the third sheet material.

[0016] According to a preferred embodiment, the translucent part is formed of security glass. The security glass can be clear glass or frosted glass.

SUMMARY OF THE DRAWINGS

[0017] Various embodiments of the present invention will now be described with reference to the figures, in which:

Fig. 1 is a schematic perspective view of a security door according to one embodiment of the invention.

Fig. 2 is a schematic perspective view corresponding

to that in Fig. 1, with certain parts removed.

Fig. 3 is a schematic perspective view on an enlarged scale of a part of the security door shown in Fig. 2.

Fig. 4 is a schematic perspective view showing on an enlarged scale a part of the security door shown in Fig. 1.

Fig. 5 is a view corresponding to that in Fig. 4, with certain parts removed.

Fig. 6 is a cross section on an enlarged scale through a part of the security door shown in Fig. 1.

Fig. 7 is a partial enlargement of Fig. 6.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0018] In the figures is shown a security door 1 provided with a translucent portion 2 according to the present invention. The door 1 is formed of a first sheet material 3, which, for example, can be a plate or a part of a plate, arranged in parallel with a second sheet material 4. The interspace between the sheet materials 3, 4 can be filled with insulating and reinforcing material. The respective sheet material 3, 4 is provided with a see-through opening 8, 9, in which a translucent part 7 is fastened. In the shown example, the translucent part 7 of a sheet is constituted by security glass.

[0019] Figs. 2 and 3 show a dismantled door 1 having a translucent portion 2. The figure shows in detail the fastening for a translucent part 7 such as a security glass. The fastening of the glass sheet is obtained with the aid of a third sheet material 10. In the shown embodiment, the third sheet material 10 is arranged, by means of a flat portion 11, on the inner side of the first sheet material 3 of the door.

[0020] Figs. 4 and 5 show the fastening of the translucent part in detail. The third sheet material 10 comprises projecting parts 13, 14, in the figures shown as L-shaped flanges extending in the direction of the second sheet material 4. The second sheet material 4 has corresponding projecting parts 17, 18, in the figures shown as flat flanges, which extend in the direction of the first sheet material 3 and which enclose and lock the L-shaped flanges of the third sheet material 10. The translucent part 7 is accommodated between the L-shaped flanges 13, 14 and is fixed to these and to the inner side of the first sheet material 3. Fixing can be realized, for example, by means of glue or tape joints. The L-shaped flanges 13, 14 further have projecting, bent first tongues 15, which bear against the flanges 17, 18 of the second sheet material 4 and engage in recesses made in the flanges 17, 18 of the second sheet material. The bent first tongues can expediently bear against the flanges 17, 18 under pre-tension. As a result, a secure fixing between the second 4 and third 10 sheet material is realized, as well as a good fixing of the translucent part 7 to the security door 1.

[0021] The second sheet material also has bent, oblique flanges 16, which extend to bear against the L-shaped flanges 13, 14. The oblique flanges 16 have projecting second tongues 16a, which are accommodated in and engage with slots 19 arranged in the L-shaped flanges. As a result, further relative fixing between the second 4 and third 10 sheet material is realized, as well as a stiffening of the second sheet material 10 around the see-through opening 9. Moreover, the flanges 16 help to further increase the capacity of the security door to withstand a break-in assault.

[0022] Figs. 6 and 7 show the fixing of the translucent part 7 and of the sheet materials 3, 4, 10 to the translucent portion 2, as is illustrated in Figs. 4 and 5. In Figs. 6 and 7, the security door 1 is further shown complete with insulation material and decorative elements.

[0023] With the fastening according to the invention, only one extra assembly component, the sheet material 10, as well as some suitable joint, such as a tape or glue joint, is required to achieve satisfactory fastening of a translucent part such as a glass sheet. With the shown solution, the assembly work is very quick and easy. By virtue of the coupling between the tongues and the flanges, which can be a friction coupling, the fastening becomes, inter alia, very strong.

[0024] The described construction can be used regardless of whether a circular or square translucent part such as glass is desired, with the advantage that a square glass can be used for a circular sight opening. A normal so-called glazing bead can be purely for decorative purposes.

[0025] The present construction also has better sound values and U-values than conventional constructions, as well as high flexibility with respect to glass size and glass thickness. The fastening of the security glass with glue/tape against one sheet material of the door gives increased seal-tightness, moreover, against air, smoke, sound, water.

[0026] A security door having a fastening of a transparent part, which fastening is satisfactory from, inter alia, the security aspect, is thereby provided.

[0027] Furthermore, the heat conductance through the door is kept low by virtue of the fact that glue against plate replaces steel fittings, and the presence of mineral wool, punched hole perforation, breaks hot/cold bridges. If so desired, the third sheet material 10 can be configured to cover a substantial part of the first sheet material 3 and can thereby help to increase the mechanical strength of the door, as well as improve insulation against sound and heat/cold. It is also possible, however, to configure the third sheet material such that it covers only a part of the first and second sheet material on a portion of desired size around the translucent portion.

[0028] It is evident that the present invention can be varied in a number of ways. Such variations should not

be regarded as deviating from the scope of the present invention. All such variations which are evident to a person skilled in the art are meant to be included within the scope of the patent claims defining the present invention. In certain applications, for example, the first tongues 15 and corresponding recesses in the flanges 17, 18 are dispensed with. Fixing of the flanges 17, 18 of the second sheet material to the flanges 13, 14 of the third sheet material 10 can then be realized, if deemed appropriate, by means of pop rivets or other joints. The third sheet material, instead of being arranged in bearing contact on the first sheet material, can bear against the second sheet material or be arranged between the first and second sheet materials.

Claims

1. Security door (1) comprising:

- a first sheet material (3),
- a second sheet material (4),

which sheet materials (3, 4) are arranged parallel to each other and at a distance apart, thus defining a door leaf (5) with an inner space (6), and

- a translucent part (7) arranged between the first (3) and the second (4) sheet material, the translucent part (7) covering a see-through opening (8, 9) arranged in the respective sheet material (3, 4),

characterized by

a third sheet material (10) which is arranged in the inner space (6), a translucent part being fastened in the door (1) by means of the third sheet material (10).

2. Security door according to any one of the preceding claims, wherein the third sheet material has a flat portion (11), with which the third sheet material (10) is arranged in the inner space (6).

3. Security door according to Claim 1 or 2, wherein the said third sheet material (10) is arranged on the inner side of the first sheet material (3).

4. Security door according to Claim 1 or 2, wherein the said third sheet material (10) is arranged on the inner side of the second sheet material (4).

5. Security door according to Claim 1 or 2, wherein the said third sheet material (10) is arranged in the inner space (6) at a distance from both the first sheet material (3) and the second sheet material (4).

6. Security door according to any one of the preceding claims, wherein the said third sheet material (10) has at least two mutually opposing projecting parts (13, 14), which extend in the direction away from the first sheet material (3) towards the second sheet material (4).

7. Security door according to any one of Claims 2-6, wherein a see-through opening (12) is arranged in the flat portion (11) of the third sheet material (10).

8. Security door according to any one of the preceding claims, wherein two projecting parts (13, 14) arranged on opposite sides of the see-through opening (12) of the third sheet material (10) and projecting from the flat portion (11) in the direction of the second sheet material (4) are provided, the translucent part (7) being arranged between the projecting parts (13, 14).

9. Security door according to any one of the preceding claims, wherein the second sheet material (4) comprises at least one projecting part (17, 18) arranged around the see-through opening (9) of the second sheet material and projecting in the direction of the first sheet material (3).

10. Security door according to any one of the preceding claims, wherein the projecting parts of the third sheet material (10) have bent tongues (15), which bear against the projecting parts of the second sheet material in order to effect engagement between the second (4) and the third (10) sheet material.

11. Security door according to any one of the preceding claims, in which the second sheet material has bent flanges (16), which are arranged at the see-through opening (9) and project into contact against the projecting parts (13, 14) of the third sheet material.

12. Security door according to any one of the preceding claims, wherein the said translucent part (7) is formed of security glass.

Fig. 1

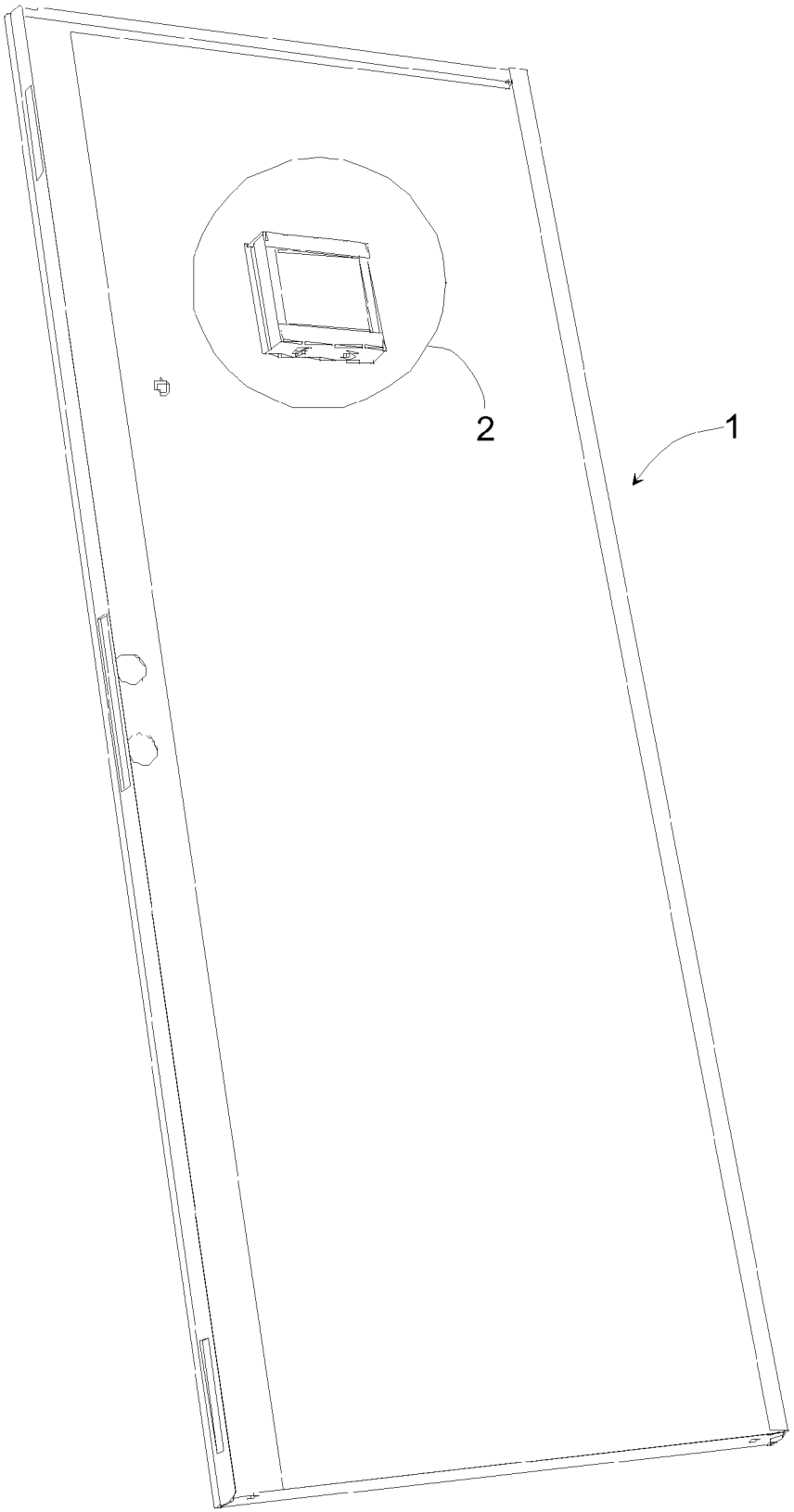

Fig. 2

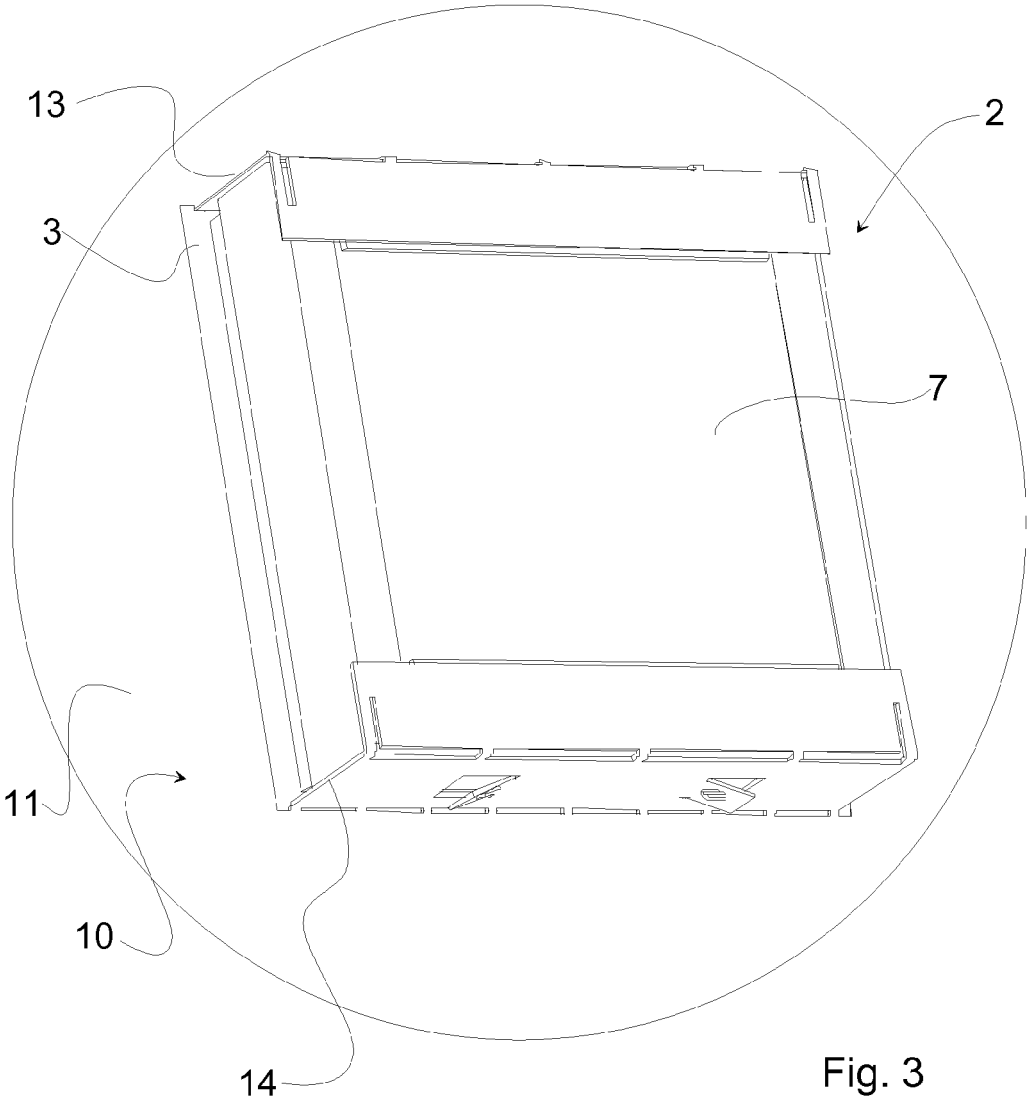

Fig. 3

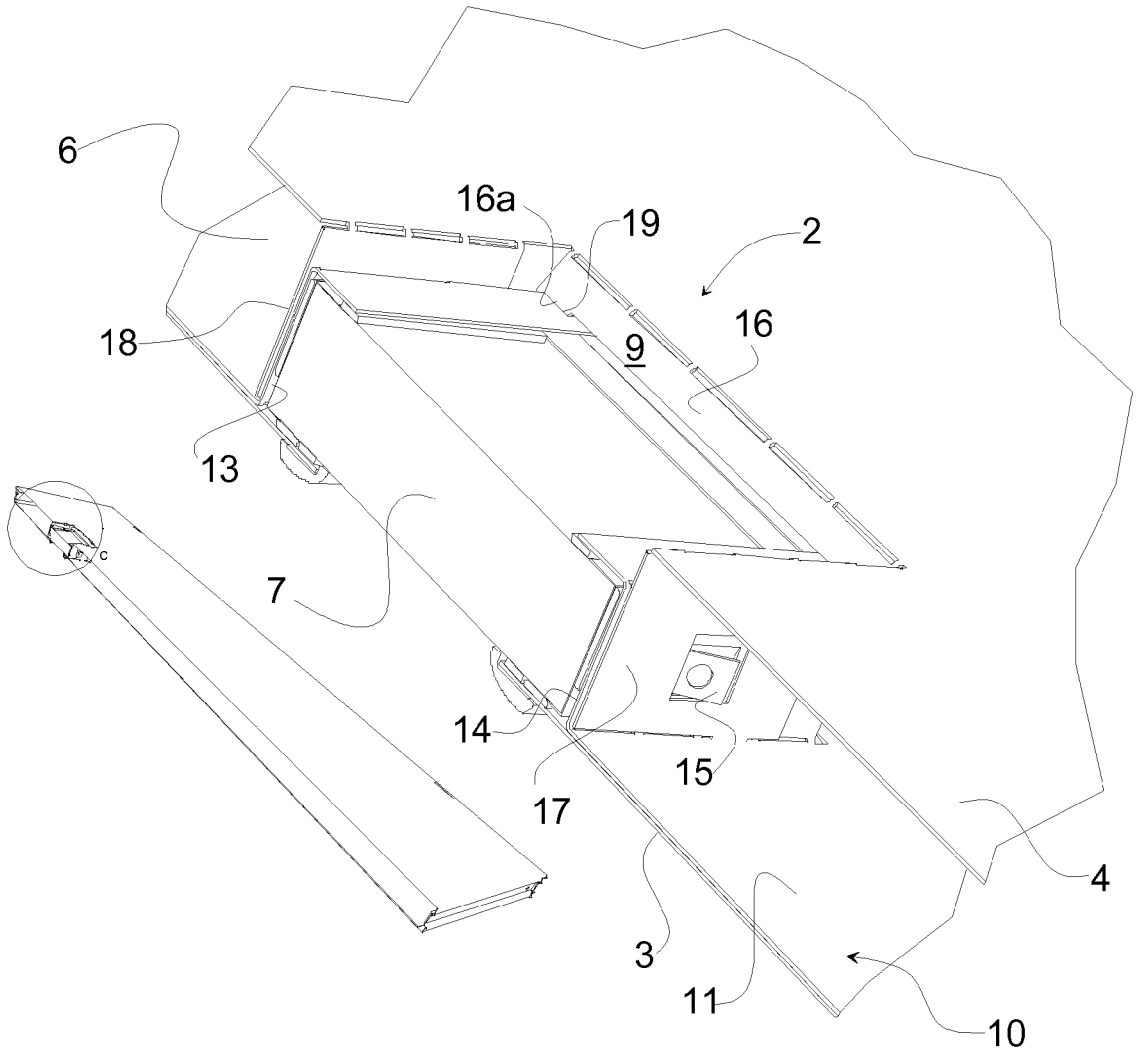

Fig. 4

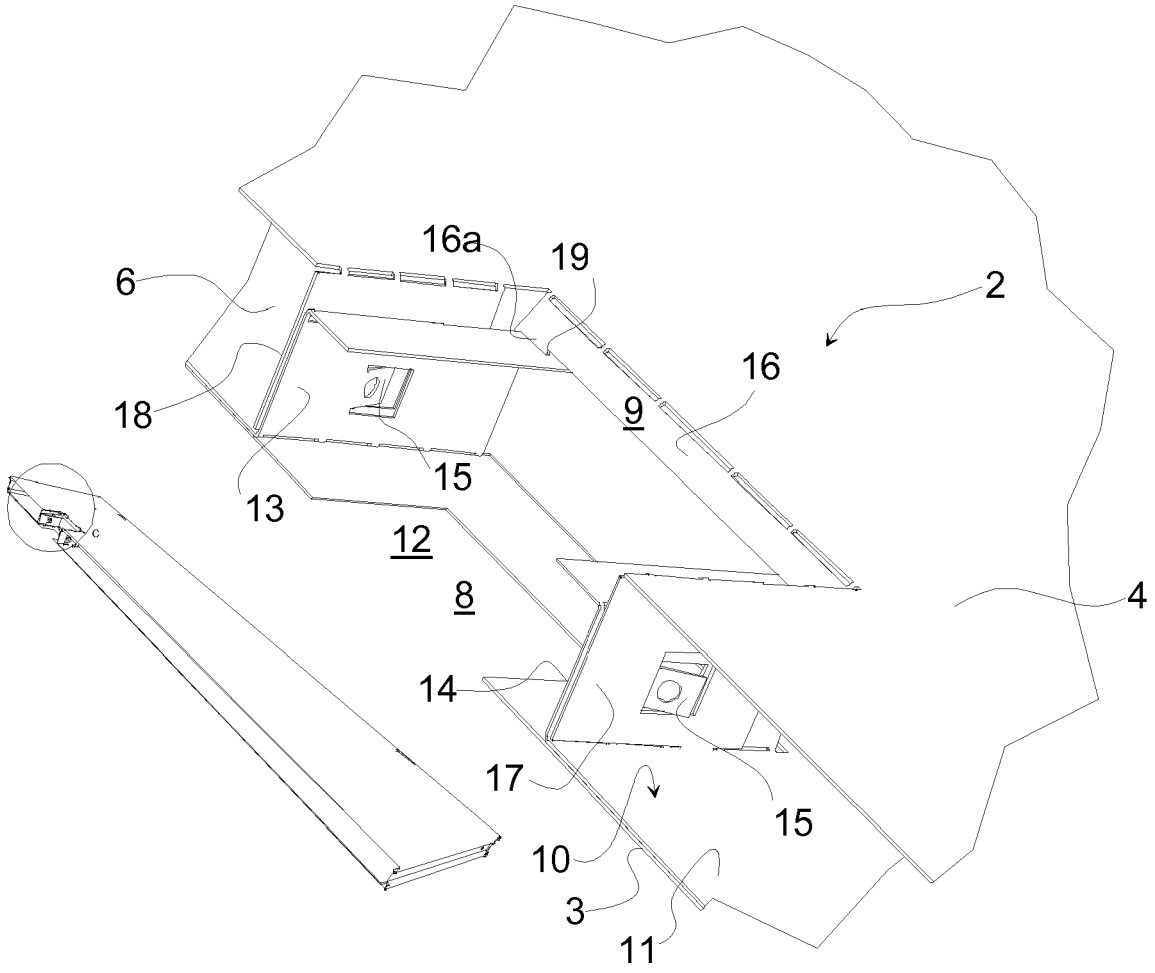

Fig. 5

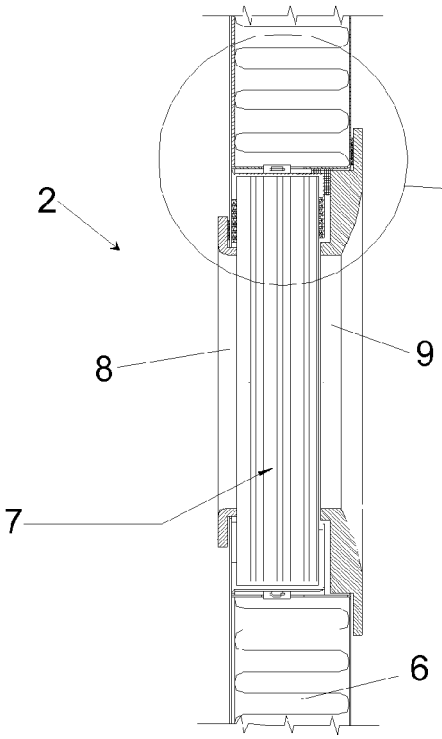

Fig. 6

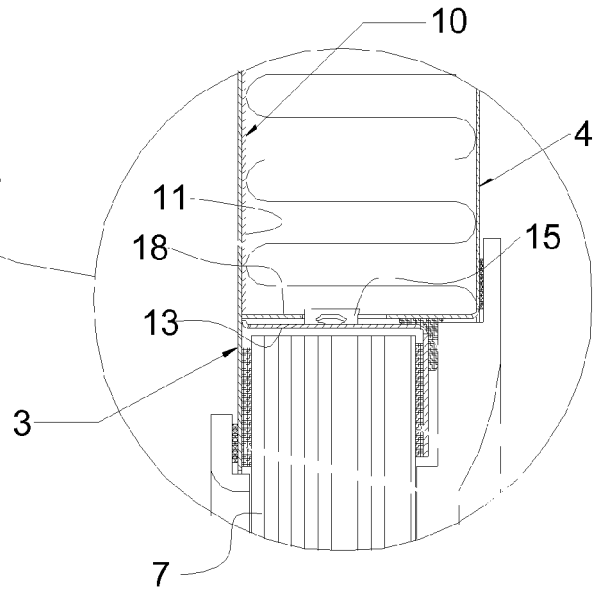

Fig. 7