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(54) Fire-resistant lamellas

(57) Fire-resistant lamella for segment gates, roll-down shutters, walls or the like, characterised in that the lamella (1) mainly consists of a hollow synthetic section (2) in which is provided a swelling product (3).

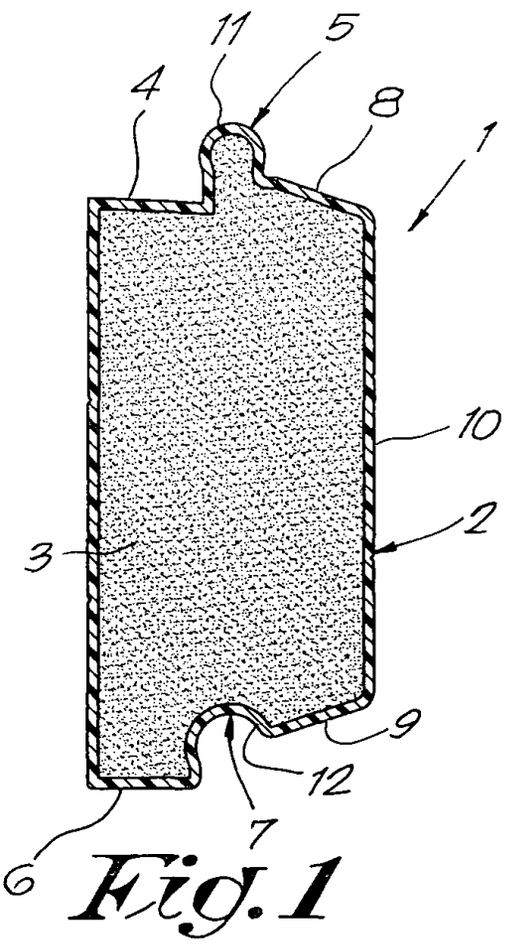

Fig. 1

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Description

[0001] The present invention concerns fire-resistant lamellas, more particularly fire-resistant lamellas for segment gates, roll-down shutters, walls or the like.

[0002] The known fire-resistant lamellas are generally made of non-flammable or heat-resistant materials such as steel or aluminium.

[0003] It is known that steel lamellas are heavy, as a result of which the segment gates, roll-down shutters or walls in which the aforesaid lamellas are implemented are not only heavy and awkward, but as a result of which also the cost price is forced up, among others due to the heavy excitation motor that has to be provided.

[0004] As an alternative, the lamellas are made of aluminium, as a result of which they are lighter and the sections can be extruded. However, the cost price is mainly increased in this case as the most expensive aluminium is used.

[0005] Moreover, for both of the above-mentioned embodiments there is a disadvantage in that the segment gate or roll-down shutter or wall is never entirely airtight, and in that opening and shutting it produces an annoying noise.

[0006] The invention aims a fire-resistant lamella which does not have the above-mentioned or other disadvantages.

[0007] To this end, the invention concerns a fire-resistant lamella for segment gates, roll-down shutters, walls or the like, whereby the lamella mainly consists of a hollow synthetic section in which has been provided a swelling product.

[0008] By swelling product is meant any substance which foams when being heated, resulting in a considerable volume increase, and which nevertheless remains stiff. Preferably, when the swelling product is heated, no toxic vapours are released.

[0009] Known swelling products contain for example graphite, alum, certain salts and/or certain bromides.

[0010] The advantage of such a lamella is that synthetic sections can be made light and can be produced at a low cost, and that the plastic can moreover be dope-dyed, so that no coats of paint have to be provided to this end.

[0011] Plastic was not regarded until now as a suitable material for fire-resistant lamellas for segment gates, roll-down shutters, walls or the like, but by providing a swelling product in the synthetic section is obtained that said swelling product will expand when being heated and will thus broaden the lamellas, such that a broader barrier is obtained which is more difficult to penetrate for a possible fire.

[0012] According to a preferred embodiment, the fire-resistant lamella according to the invention is provided with a tooth and a groove, as a result of which two lamellas working in conjunction will obtain a good air seal.

[0013] The invention also concerns a segment gate, roll-down shutter or wall, whereby it is mainly built up of lamellas according to the invention.

[0014] Naturally, apart from the favourable cost price, also the high fire-resistance and the good air sealing of such segment gate, roll-down shutter or wall are considered to be major advantages.

[0015] Moreover, such a segment gate, roll-down shutter or wall offer the advantage that they produce considerably less annoying noise when being opened and shut, and they can be obtained in a large selection of colours without any risk of the paint peeling off, which would subsequently result in corrosion.

[0016] Finally, it should be noted that the light structure does not only make the accessories such as the excitation motor of such a segment gate, roll-down shutter or wall cheaper, but also strongly simplifies the operation thereof and possibly makes a motor unnecessary.

[0017] Moreover, the light structure makes it possible for a segment gate or roll-down shutter according to the invention to be used horizontally as well, for example in order to close a swimming pool or as a removable roof element.

[0018] In order to better explain the characteristics of the invention, the following preferred embodiments of the invention are given as an example only, with reference to the accompanying drawings in which:

figures 1 to 4 represent different embodiments of a fire-resistant lamella according to the invention, seen as a section;
figure 5 represents the part indicated by F5 in figure 2 to a larger scale;
figure 6 schematically represents the segment gate according to the invention in perspective;
figure 7 is a section according to line VII-VII in figure 6;
figure 8 represents the part indicated by F8 in figure 7 to a larger scale.

[0019] As represented in figure 1, the invention concerns a fire-resistant lamella 1 for segment gates, roll-down shutters, walls or the like, whereby the lamella mainly consists of a hollow synthetic section 2 in which has been provided a swelling product 3.

[0020] The swelling product may for example contain graphite, alum, certain salts or bromides, and it has the property to foam but nevertheless remain stiff when being heated.

[0021] The section 2 is made of extruded PVC according to the invention.

[0022] The section 2 has a mainly rectangular cross section, whereby in this embodiment, the first short side 4 is provided with a tooth 5, and whose second and opposite short side 6 is provided with a groove 7.

[0023] The above-mentioned opposite sides 4 and 6 are both provided with a bevel 8, 9 respectively, respectively connected to the tooth 5 and the groove 7 and extending up to the same long side 10.

[0024] The tooth 5 and the groove 7 are provided with corresponding roundings 11, 12 respectively, which, when the above-mentioned tooth 5 has been provided in a groove 7 of an adjacent second lamella 1 can co-operate in a hinging manner.

[0025] Figures 2 to 4 represent some other special embodiments of the lamella 1 according to the invention, whereby one or two supports 13 are provided in the section 2, for example one or two wooden slats around which the swelling product 3 is provided.

[0026] As is represented in an enlarged manner in figure 5, spacer sleeves 14 for the support 13 are provided on the inside of the section 2, in order to prevent a support 13 from resting against the inner wall of the section 2, in order to make sure that the support 13 is entirely surrounded by a swelling product 3.

[0027] Figures 6 to 8 represent a segment gate 15 which is composed of lamellas, as is represented in figure 1.

[0028] The lamellas 1 of such a segment gate 15 are laterally framed between guides 16, and they are mutually hinge-mounted by the co-operating teeth 5 and grooves 7 of the adjacent lamellas 1.

[0029] In this special embodiment, the lamellas 1 are provided with passages 17, aligned with the teeth 5 and the grooves 7, through which a cable 18 or the like is each time fed through.

[0030] In this embodiment, the bottommost lamella 1 is provided with a cavity 19 in which is provided a locking clamp 20, which locks the cable 18 with the above-mentioned bottommost lamella 1.

[0031] The cable 18 is connected to a drum 22 of the non-represented roll-up mechanism near its far end 21.

[0032] The working of the above-described fire-resistant lamella 1 is very simple and as follows.

[0033] When the temperature rises in case of fire or the like, the swelling product 3 will foam, as a result of which the lamella 1 will expand, whereas the swelling product 3 remains stiff.

[0034] This results in a broader barrier which is harder to penetrate for a possible fire.

[0035] The working of the above-described segment gate 15 is special in that the rounded teeth 5 and grooves 7 work so well together that an airtight sealing is obtained, and that the presence of upward directed teeth 5 prevents downpour from seeping in.

[0036] Such an airtight sealing is also crucial in case of a possible fire since, in this way, at least along the segment gate 15, no extra oxygen is supplied and the flames cannot flash over.

[0037] When the segment gate 15 is lowered or shut, the lamellas 1 can rest upon each other, such that a good sealing is moreover promoted.

[0038] In order to lift the segment gate 15, the cables 18 must be pulled up, for example by driving the drum 22.

[0039] The bottommost lamella 1, and indirectly also the lamellas 1 situated above it, are pulled up, while the guides 16 and upwards also the cables 18 determine the direction of the movement.

[0040] Whereas the lamellas 1 must hinge, it is clear that the roundings 11 and 12 at the height of the tooth 5, the groove 7 respectively, as well as the bevel 8 and 9, allow for this mutual rotation.

[0041] It is clear that cavities 19 and accompanying locking clamps 20 cannot only be provided in the bottommost lamella 1 and possibly also in the topmost lamella 1, but also in the intermediate lamellas 1.

[0042] Such intermediate locking clamps 20 make sure that, in case of a possible heating, for example due to a fire, the lamellas 1 will not all be piled up and shoved down with an accumulated effect, due to possible distortions of the lamellas 1. Intermediate locking clamps, for example every six or seven lamellas 1, prevent the formation of large openings between the lamellas 1 under such circumstances, which further promotes the fire safety.

[0043] It is clear that the form of the sections 2 does not matter for the good working order of the lamellas 1, and that instead of the predominantly rectangular form, the section 1 can assume any other possible form whatsoever, as long as sufficient space is left at the height of the tooth 5 and the groove 7, such that the mutual rotation is still guaranteed.

[0044] For segment gates or roll-down shutters to be provided horizontally, for example over a swimming pool or as a roof element, a suitable form can be provided which increases the bending strength.

[0045] Besides, the lamellas 1 must not be made entirely hollow, nor should the swelling product 3 fill up all the cavities in the sections 2.

[0046] It is also clear that the passages 17 must not be aligned with the teeth 5 and the grooves 7, but that such a unique position promotes the mutual rotation of the lamellas 1. Moreover, the teeth 5 and grooves 7 of the lamellas 1 must not be provided near the centre of the short sides 4 and 6.

[0047] The lamellas 1 according to the invention can be made, apart from the usual PVC, of other plastics as well, but PVC offers the well-known advantages of durability, easy processing and easy maintenance.

[0048] The present invention is by no means limited to the embodiments given as an example and represented in the accompanying drawings; on the contrary, such a fire-resistant lamella and segment gate can be made in different shapes and dimensions while still remaining within the scope of the invention.

Claims

1. Fire-resistant lamella for segment gates, roll-down shutters, walls or the like, **characterised in that** the lamella (1) is mainly formed of a hollow synthetic section (2) in which has been provided a swelling product (3).

2. Fire-resistant lamella according to claim 1, **characterised in that** at least one support (13) has been provided in the section(2).

3. Fire-resistant lamella according to claim 2, **characterised in that** the above-mentioned support (13) is entirely surrounded by the swelling product (3).

4. Fire-resistant lamella according to claim 2, **characterised in that** the support (13) is made of wood.

5. Fire-resistant lamella according to claim 2, **characterised in that** the section (2) is provided with spacer sleeves (14) on the inside for the above-mentioned support (13).

6. Fire-resistant lamella according to claim 1, **characterised in that** the section (2) is an extruded PVC section.

7. Fire-resistant lamella according to claim 1, **characterised in that** the section (2) has a predominantly rectangular cross section, two opposite sides (4-6) of which are provided with a tooth (5) and a groove (7) respectively.

8. Fire-resistant lamella according to claim 7, **characterised in that** the above-mentioned opposite sides (4-6) are provided with a bevel (8-9), connecting to the tooth (5) and the groove (7) respectively.

9. Fire-resistant lamella according to claim 7, **characterised in that** the tooth (5) and the groove (7) are provided with corresponding roundings (11-12) such that, when two such lamellas (1) are put together, more particularly with the tooth (5) of a first lamella (1) in the groove (7) of a second lamella (1), they can work in conjunction in a hinged manner.

10. Segment gate, roll-down shutter or wall, **characterised in that** it is mainly built up of lamellas (1) according to one or several of the preceding claims.

11. Segment gate, roll-down shutter or wall according to claim 10, **characterised in that** the lamellas (1) are placed on top of each other with the tooth (5) and groove (7) such that they can hinge, and **in that** the lamellas (1) are provided with passages (17) through which a cable (18) or the like is fed.

12. Segment gate, roll-down shutter or wall according to claim 11, **characterised in that** the cable (18) is locked at least with the bottommost lamella.

13. Segment gate, roll-down shutter or wall according to claim 11, **characterised in that** the cable (18) is locked every so many lamellas.

14. Segment gate, roll-down shutter or wall according to claim 11, **characterised in that** the cable (18) is tightened.

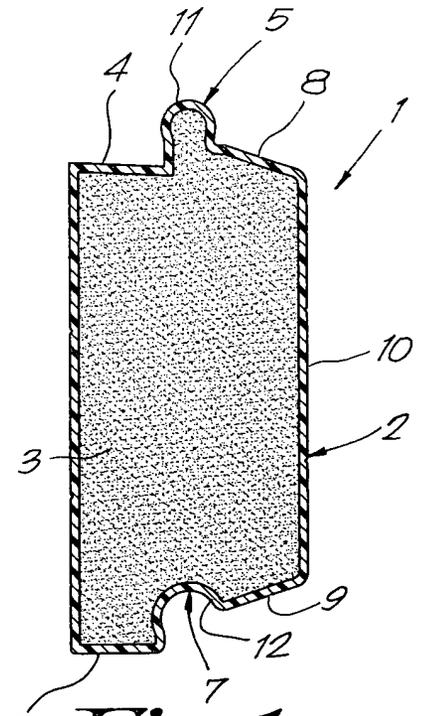

Fig.1

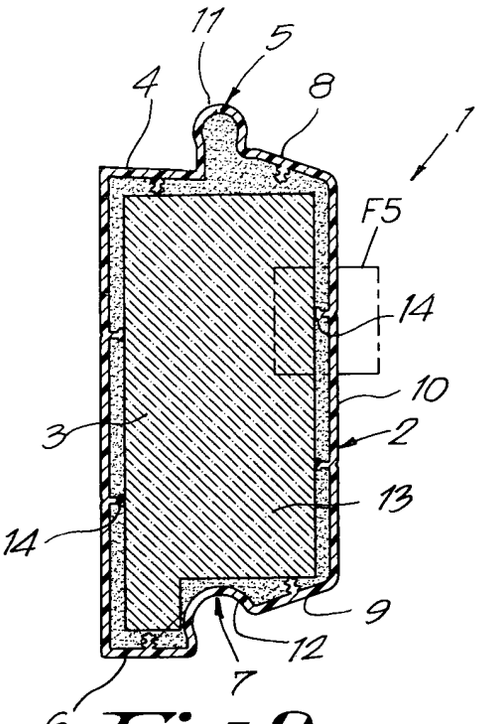

Fig.2

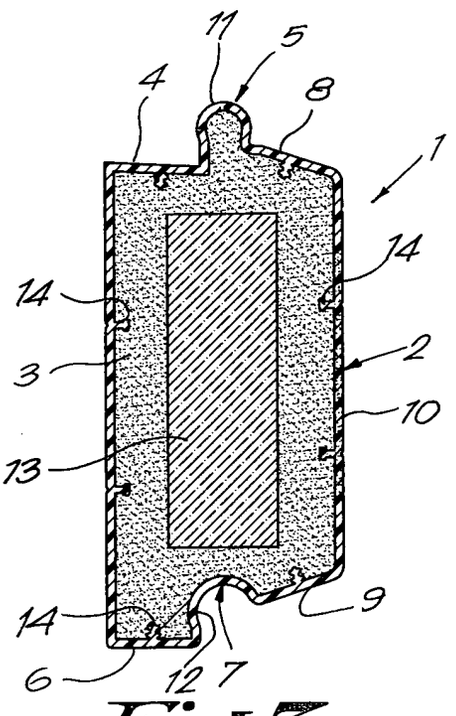

Fig.3

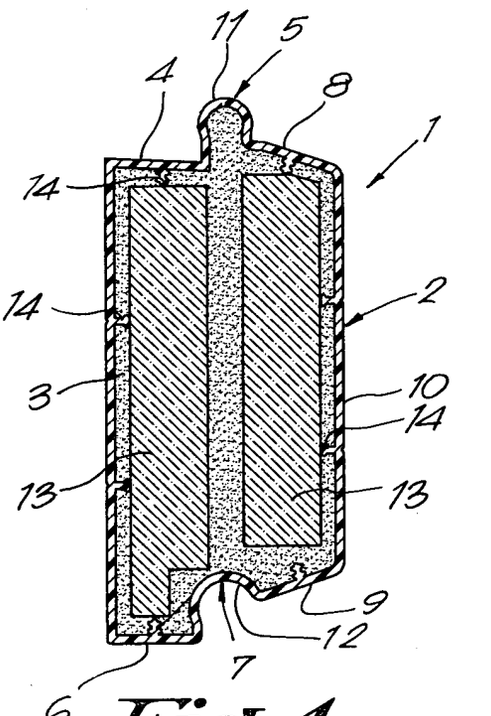

Fig.4

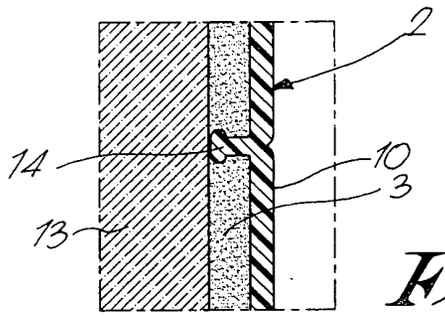

Fig.5

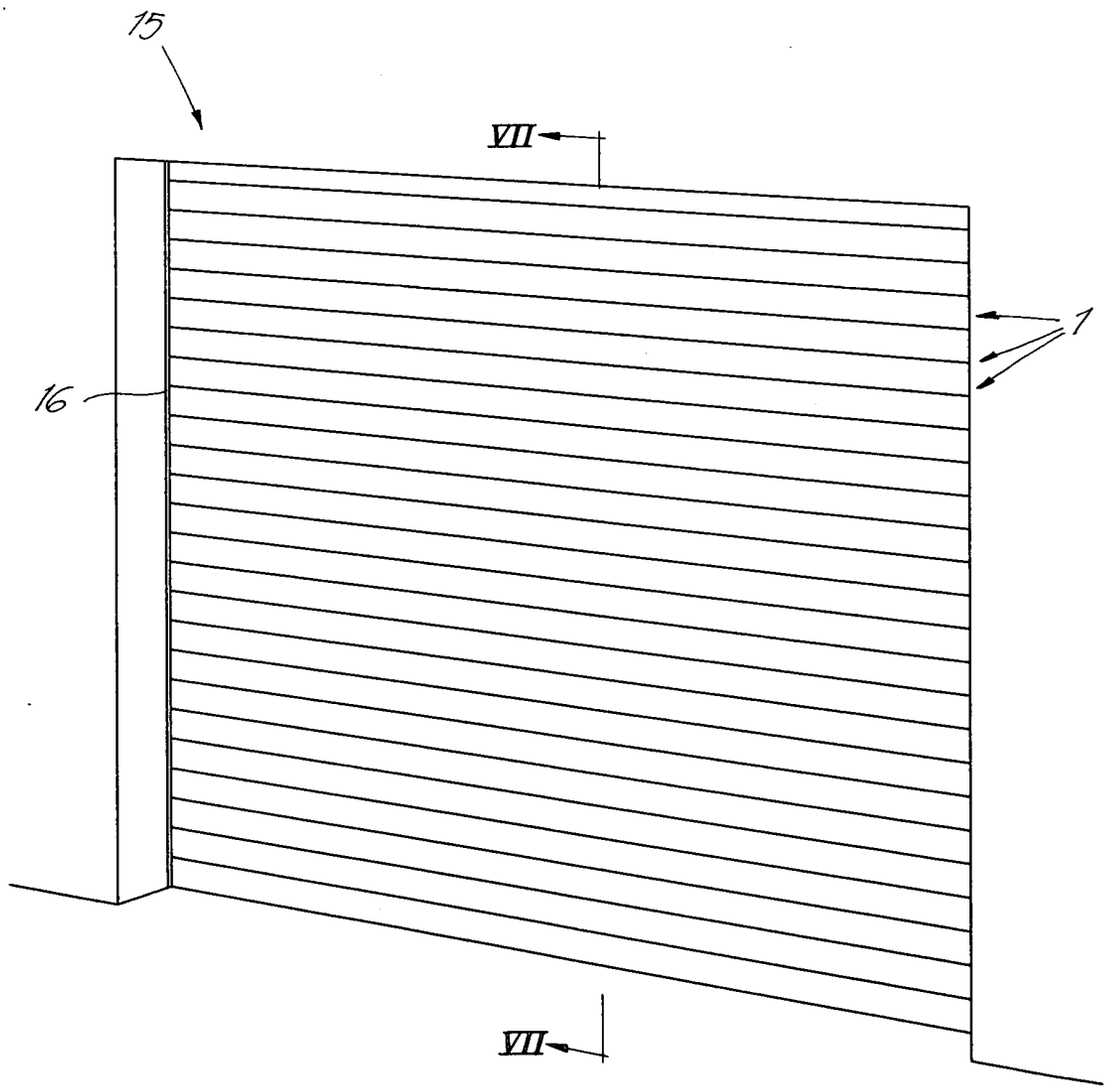

Fig.6

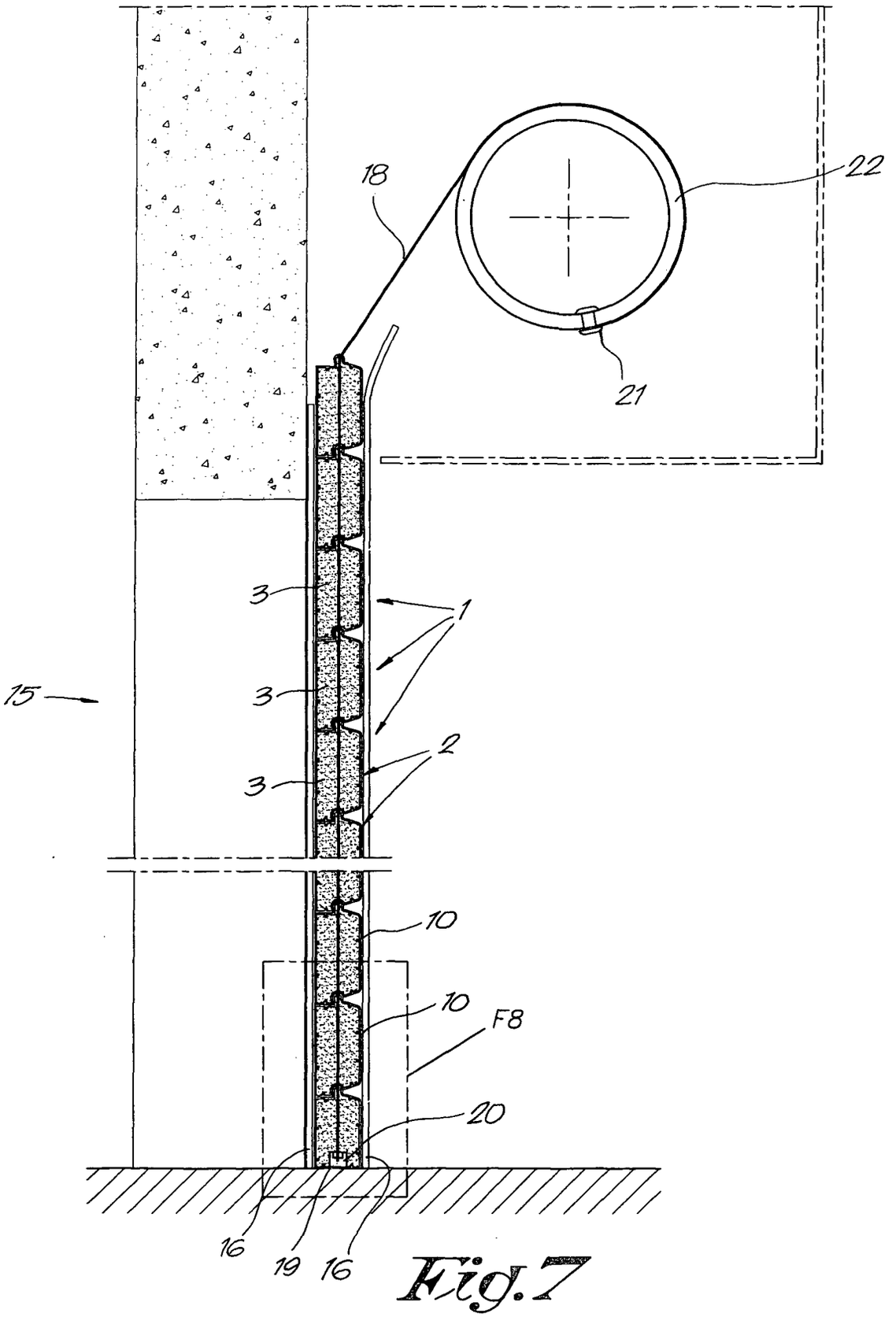

Fig.7

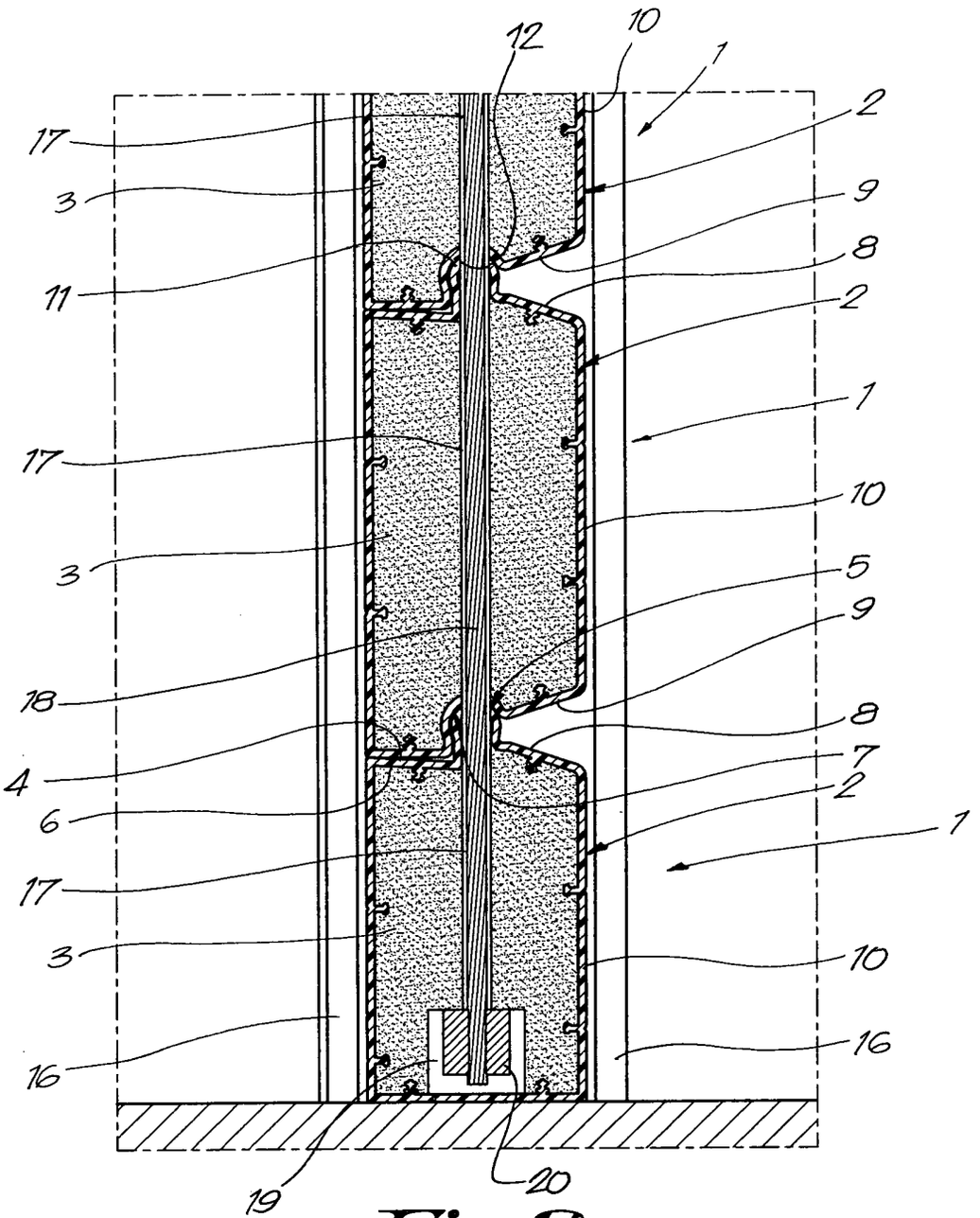

Fig.8