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(54) **Garage door device for protecting fingers, garage door comprising such device and process for providing such**

(57) The invention relates to a device for sealing off a space arising between two hingeably joinable panels (2,6), during the rotation thereof, which device serves

as a protection profile (16) against catching body parts, for example fingers, in this space, wherein the device (16) has such a form that an area arising between the two hingeable panels is sealable.

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Description

The present invention relates to a device for protecting body parts, such as fingers, during opening and closing of a garage door, assembly for a garage door comprising this device and to a method for providing such an assembly for a garage door or the like.

Garage doors of the type comprising panels joined to each other by means of a hinge are known. These doors can be opened and closed by pushing them upwards and pulling them downwards respectively, whereby the door runs in a guide rail arranged in the garage opening. In order to prevent body parts, in particular fingers, being caught up in the area between the garage door panels on the opening and closing of the door, such garage doors are provided with finger protection profiles, which profiles fill the area between the panels, arising on opening and closing of the garage door.

An object of the present invention is to provide a device yielding an alternative solution to this problem.

According to a first aspect of the present invention, there is provided a device for closing off an area arising between two hingeable, mutually connectable panels during the rotation thereof, in order to provide protection against trapping body parts, for example fingers, in this area, wherein the device has such a form that an area arising between the two hingeable panels is substantially closed off.

Such a device can be simply arranged between the panels of existing garage doors. This yields the advantage that instead of completely replacing a garage door in order to obviate the problem of trapping one's fingers between the panels thereof, a profile device according to the present invention can be simply inserted between the panels of existing garage doors.

According to a further aspect of the present invention, there is provided an assembly for a garage door which is suitable for opening and closing by respectively pushing upwards, pulling downwards with the aid of a runner/rail system, wherein the assembly comprises a first panel joined at an end thereof by means of one or more hinges to a second panel, and a separate protecting profile device as described above, which is pre-arrangeable between the ends of the first and second door panels in the vicinity of the hinge, so that any space arising between the panels is sealable.

Since the assembly comprises a profile protecting device arrangeable according to the wishes of the user, this can be arranged in order to meet specific desires.

When an imaginary plane is considered which runs longitudinally through each of the panels and laterally through the protection profile of the assembly, the two resulting panel halves are preferably symmetric with each other.

Accordingly, when oppositely arranged surfaces of the panels, preferably being industrial panels which consist of two steel plates separated by means of a foam layer, are provided with different finishes or structures,

for example a zinc finish or a particular embossed relief, the user can determine which surface of the panel can be used as the outer or inner surface of the garage door.

The assembly preferably comprises an extension at one end of the first panel which corresponds with a recess on the second panel, wherein the protection profile device is preferably arranged on the extension of the first panel. This provides an effective protection.

The assembly further preferably comprises securing means for securing the protection profile device, and draft prevention means, for preventing any possible draft from passing through openings between the panels, in order to reduce draft in a garage for example.

According to another aspect of the present invention, there is provided a method for yielding an assembly suitable for a garage door or the like, which garage door is built up from a number of panels mutually joined together by means of a hinge, wherein the method comprises the steps of transporting a number of pre-made hingeably, joinable panels from the panel maker to the panel supplier, and arranging one or more independent protection profile devices between the hingeably, joinable panels, either at the supplier, or at the user destination.

Known garage door assemblies are built up from hingeable, mutually joinable panels, wherein one integral end of a panel has such a form that this serves as a finger protection profile, which fills the space arising between panels with respect to each other, when these are rotated about the hinge.

A disadvantage of these known garage doors comprising such panels, is that the first panel must be pre-fabricated with an integral finger protection profile at the panel maker's, and joined to the second panel before they are transported to the garage door supplier. Accordingly, when a supplier does not have a garage door in stock, which meets the particular requirements of a client, a new supply of preassembled garage doors must be ordered by the maker, wherein these must often be made according to the specific wishes of the client.

In order to meet a variety of demands from different clients, the supplier must have a large and varied stock of preassembled garage doors. This in turn requires a large warehouse and an efficient search system.

According to the method of the present invention, an independent protection profile device can be arranged between the panels by the garage door supplier. The client then only needs to choose the desired type of panel, i.e. considering the desired door finish for the inner and outer surfaces of the garage door, whereafter the protection profile can be arranged between the panels.

Accordingly, a client friendly, efficient and simple method is provided, taking into consideration that a new order by the maker of certain garage doors in order to meet specific desires of the client, is no longer necessary, since these doors can now be assembled together with finger protection profiles at the site of the garage

door supplier.

The hingeably, joinable panels can be joined together by the supplier or at the user destination of the garage door. This provides the client with a large amount of flexibility according to his or her wishes.

According to a further aspect of the present invention there is provided a garage comprising the above garage door assembly.

The present invention will now be described by means of the following description, which refers to figures 1-15, wherein:

figure 1 shows two hingeably joined panels of a garage door in a closed position, without a finger protection profile device,

figure 2 shows a perspective view of the panels from figure 1 in an open position,

figure 3 shows a partially cut away perspective view of an assembly according to the present invention in a closed position,

figure 4 shows the assembly from figure 3 in an open position,

figure 5 shows a side view of an end of a first garage door panel of the assembly,

figure 6 shows a side view of a corresponding end of a second garage door panel of the assembly,

figures 7-12 show various embodiments of the assembly and the device according to the present invention,

figure 13 shows a perspective view of the finger protection profile device according to the present invention,

figure 14 shows a partially cut away side view of a preferred embodiment of the assembly according to the present invention in an open position,

figure 15 shows the assembly from figure 14 in a closed position.

A sectional garage door comprises a first panel 2, joined by means of a hinge 4 to a second corresponding panel 6 (figures 1, 2).

In order to be able to easily rotate about the hinge 4, the second panel 6 has a recess 8 which is coupleable with an extension 10 of the first panel 2 in a closed position of the door (see figure 1).

On rotating the panels 2, 6 around the hinge 4, a space 12 is created therebetween (see figure 2).

Such a space 12 can be extremely dangerous if fingers are caught up herein during the opening and closing of the garage door.

An assembly 14 (see figures 3 and 4) according to the present invention comprises such a first panel 2, a second panel 6 and a hinge 4. A finger protection profile 16 is arranged on the extension 10 of the first panel 2, in order to seal off the area 12 which arises on rotation of the panels 2 and 6 around the hinge 4 (see figure 4).

Preferred embodiments of both the end of panel 2 with the extension 10 and the end of panel 6 with the

recess 8 are given below A to E, and F to I respectively (see figures 5 and 6).

A = 35 mm
 B = 15 mm
 C = 7 mm
 D = 26 mm
 E = 38 mm
 F = 35 mm
 G = 20 mm
 H = 38 mm
 I = 13 mm

These panels 2, 6 consist of a steel outer plate 18 and a steel inner plate 19, separated by means of a hard foam spacing layer 37 (see figures 5, 6).

These plates 18, 19 can be provided with a protective zinc layer, a protective foil layer or any desired finish.

A perspective view of a preferred embodiment of the protection profile 16 is shown in figure 13. The profile 16 has a substantially convex front face 35, an under face 38, and a rear face 21. A first lip 20 is integral with the front face 35 and a second, larger lip 22 is integral with the rear face 21.

This preferred embodiment of the device is made from extruded, hard synthetic material, but it will be clear that the profile can be made of other materials such as zinc steel, aluminium or any such like material.

As shown in figures 7, 8, 9 and 11 the profile according to the present invention can also be provided with a recess 24 in the rear face 21, wherein a rubber draft excluder 36 is mounted.

The first and the second lips 20, 22 respectively are glued to the extension 10 in the embodiment as shown in figure 7.

Alternatively, the second lip 22 can be screwed onto this extension 10 (figure 8).

In another preferred embodiment of the profile according to the present invention (figure 9), the bottom surface is provided with a profile extension 26 which extends into the foam layer 37 of the panel 2. Both the hinge 4 and the profile extension 26 are secured to the panel 2 by means of a screw 28 which extends through the hinge 4, the inner plate 19, the foam layer 37 and the profile extension 26.

Another embodiment of the profile according to the present invention (figure 10) is made from two zinc steel bent plates 30, 32, joined together, wherein the draft excluder 34 is made from a self-adhesive sealing tape 34.

The preferred embodiments of this profile (figure 10) and the draft extruder 34 are given below:

J = 14,2 mm
 K = 22,4 mm
 L = 24 mm
 M = 12 mm

N = 8 mm

In another embodiment (figure 12) of the present invention, the draft extruder 34 is glued to the profile.

A preferred embodiment of the assembly and device according to the present invention is shown in figures 14 and 15.

A first panel 50 tapers at one end thereof to form an extension 52. A hinge 54 is mounted on an inner shoulder 56 of the first panel 50. A first panel plate 58 extends from the hinge 54 along the first panel 50. A second panel plate 60 extends from the hinge 54 along a second panel 62. The hinge 54 is joined to the panels 50, 62 respectively by means of screws 64, 66 respectively. The first and second panels 50, 62 are filled with hard foam 68. Inner contours 70 of the extension 52 extend back into this hard foam layer 68 of the first panel 50. Between these two depending contours 70 of the extension 52, there is a channel 74 arranged in the hard foam layer 68. A finger protection profile 76 is arranged on the extension 52. This preferred embodiment of the finger protection profile according to the present invention has roughly the same form as that shown in figure 13, but is provided at an underface 78 thereof with a securing extension 80, which extends in the hard foam layer channel 74, in order to secure the profile 76 to the first panel 50. The securing extension 80 is furthermore provided with fastening ribs 82, 84 respectively to provide a good fastening thereof in said channel 74. In order to ensure a very good stability of the finger protection profile 76, the screw 64 passes through the first panel plate 58, into the first panel 50 and through the depending contours 70 of the extension 52, the hard foam layer channel 74 and the securing extension 80.

A rear face 85 of the profile 76 is provided with an opening 86 wherein a draft extruder 88 is secured. This draft extruder has a form in profile akin to that of a baby's dummy, wherein a tip 90 thereof is partially hollow in order to yield flexibility thereof.

On rotating the panels 50, 62 respectively around the hinge 54, the second panel 62 comes to rest directly above the first panel 50 as shown in figure 15.

As also shown in figure 3, 4 and 6, the second panel 62 is provided with a recess 92 which is formed by the edges of the second panel 62 being turned back in on themselves to form two appendages 94, 96, a mouth 98 which is formed by the two appendages being sealed off by the hard foam layer 68.

On mutual rotation of the panels 50, 62 around the hinge 54, the extension 52 and protection profile 76 are enclosed between the appendages 96, 94 (see figure 15), so that the tip 90 of the draft extruder 88 comes to rest against an inner profile of the inner appendage 96 of the second panel 62.

In this position, the outer appendage 94 of the second panel 62 completely covers the protection profile 76 so that this is not visible. The positioning of the hinge 54 on the shoulder 56 of the first panel 50 enables the pan-

els to mutually rotate so that the protection profile 76 is obscured by the appendage 94 in this position (figure 15), whereby a good finger protection is also provided. As shown in figure 15, a good finger protection is not only provided when standing in front of the garage door, but is also provided if the garage is gripped at the edges thereof.

A small opening 100 which is left at a front side of the garage door (figure 15), is visually equivalent with aesthetic recesses arranged to extend laterally across the panels in preferred embodiments thereof (not shown) in order to create a visually pleasing impression.

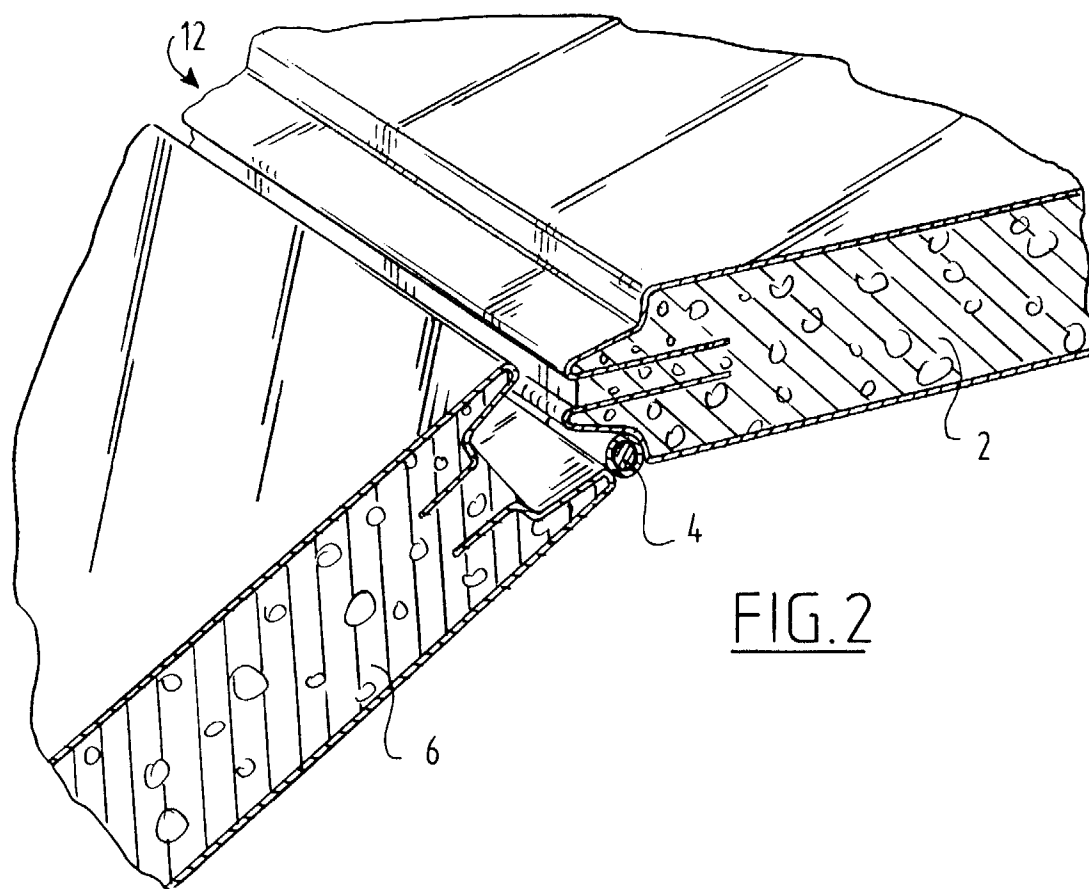
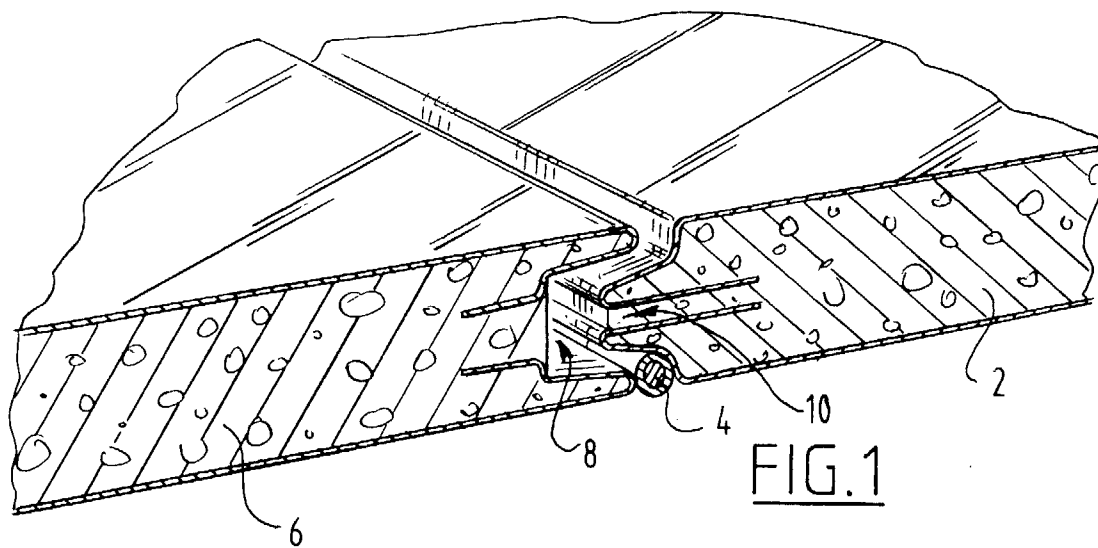
The present invention is not limited to the above described preferred embodiments, the requested rights are rather determined by the following claims.

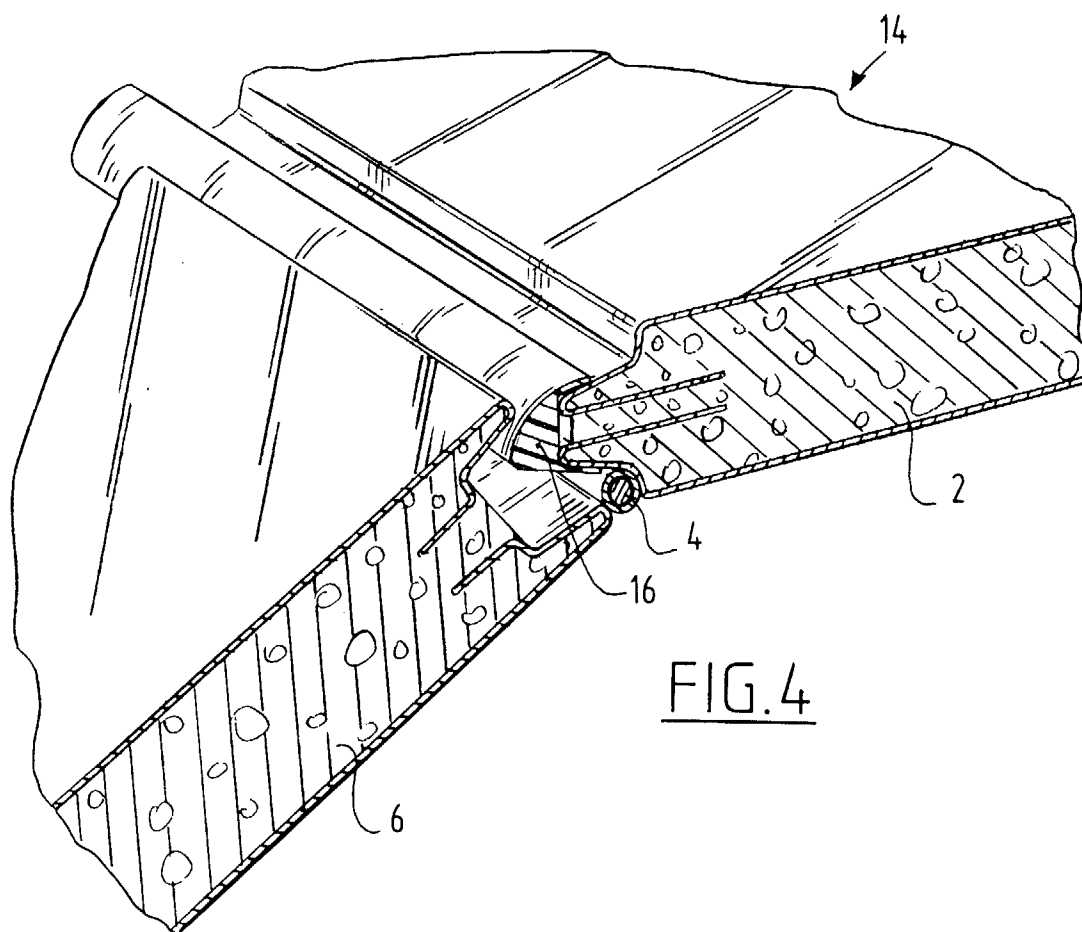
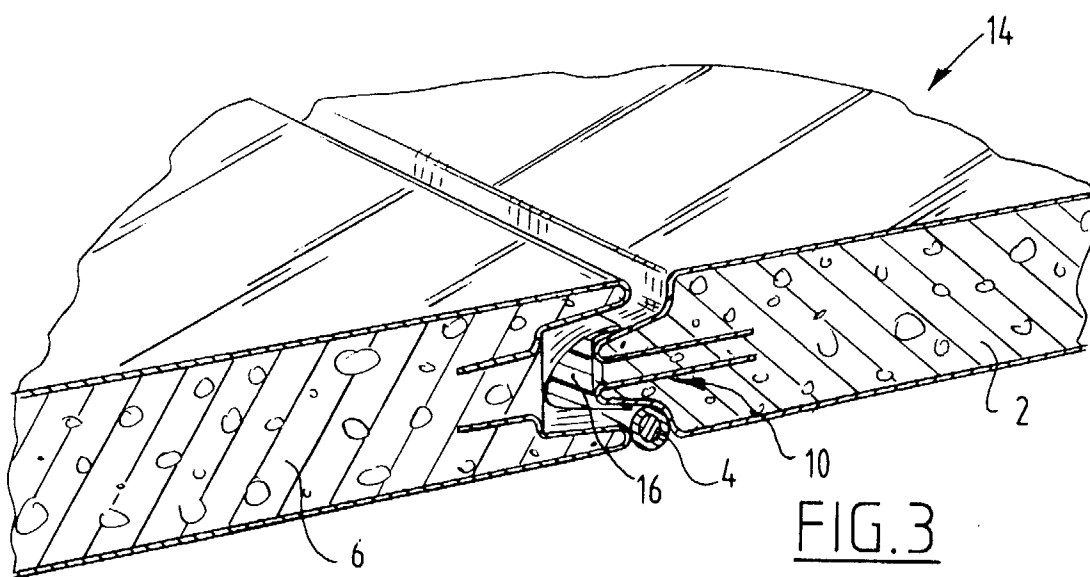
Claims

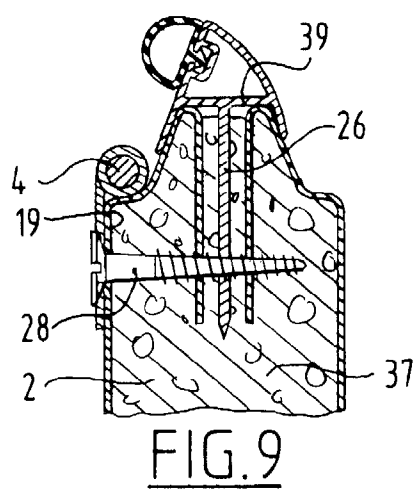
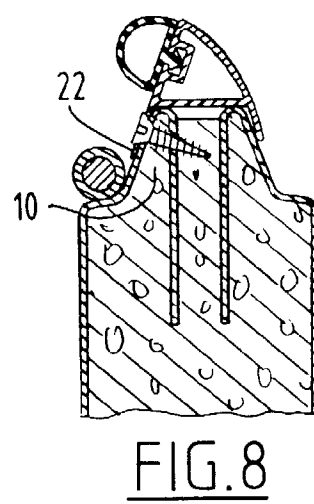
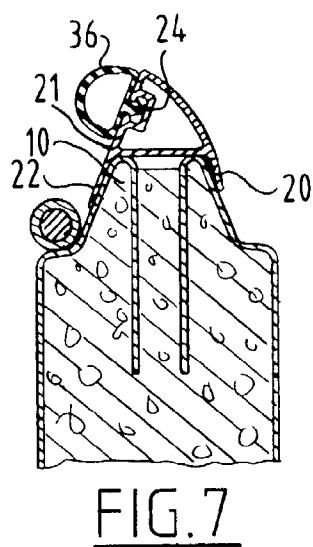
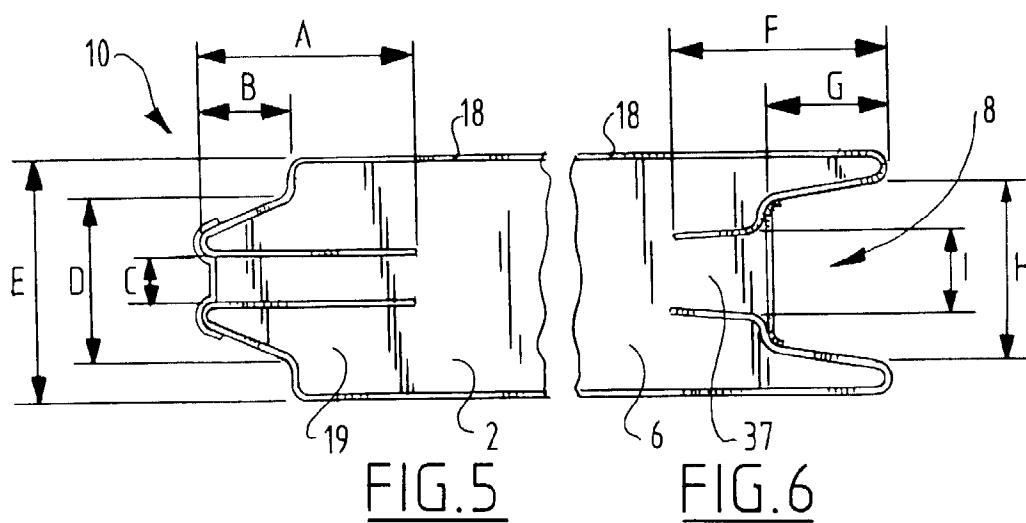
1. Device for sealing off a space arising between two hingeably joinable panels, during the rotation thereof, which device serves as a protection profile against catching body parts, for example fingers, in this space, wherein the device has such a form that an area arising between the two hingeable panels is sealable.
2. Device according to claim 1, comprising an under face, joined at one side thereof with a front face, and on the other thereof with a rear face, wherein the front and rear faces are joined together and wherein the front face has a substantially convex form.
3. Device according to claims 1 or 2, further comprising stabilizing means, for stabilizing thereof between hingeable panels.
4. Device according to claim 3, wherein the stabilizing means comprise one or more lips extending from the front and/or rear face thereof.
5. Device according to any of the claims 1-4, further comprising securing means for the securing thereof between hingeable panels.
6. Device according to claim 5, wherein the securing means comprise an extension joined to the bottom face
7. Device according to any of the claims 1-7, further comprising draft excluding means for sealing off draft openings.
8. Assembly for a garage door, suitable for opening and closing by means of pushing upwards, pulling downwards respectively the aid of a runner rail system wherein the assembly comprises a first panel

joined at one end thereof by means of one or more hinges with an end of an second panel, and an individual protection profile device according to any of the claims 1-7, which is pre-arrangeable between the ends of the first and second door panels in the vicinity of the hinge. 5

9. Assembly according to claim 8, wherein an imaginary plane running longitudinally through each of the panels and laterally through the protection profile yields two panel halves being substantially symmetrical with one another. 10
10. Assembly according to claims 8 or 9, wherein an extension is arranged on the end of the first panel which corresponds with a recess on the end of the second panel. 15
11. Assembly according to claim 10, wherein the protection profile device is arranged on the extension of the first panel. 20
12. Assembly according to any of the claims 8-11, further comprising securing means for securing of the protection profile device. 25
13. Method for providing an assembly for a garage door or the like, which garage door is assemble from a number of hingeably joined panels, wherein the method comprises the steps of transporting a number of pre-made hingeably, joinable panels from a panel maker to a panel supplier and arranging one or more protection profile devices according to any of the claims 1-7 between the hingeable, joinable panels, either by the supplier or at the end user destination. 30 35
14. Method according to claim 13, wherein the hingeably, joinable panels are either by the supplier or at the user destination of the garage door, joined together. 40
15. Method according to claim 13, wherein the hingeably, joinable panels are joined together at the premises of panel maker. 45
16. Assembly according to any of the claim 8-12, comprising a device according to any of the claims 1-7.
17. Garage door comprising an assembly according to claim 16. 50
18. Garage comprising a garage door according to claim 17. 55







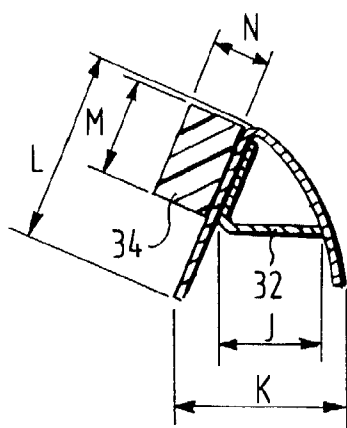


FIG. 10

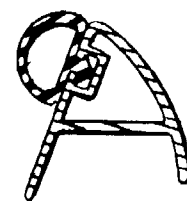


FIG. 11

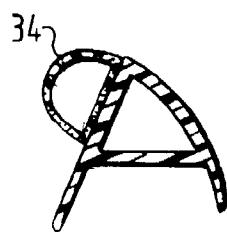


FIG. 12

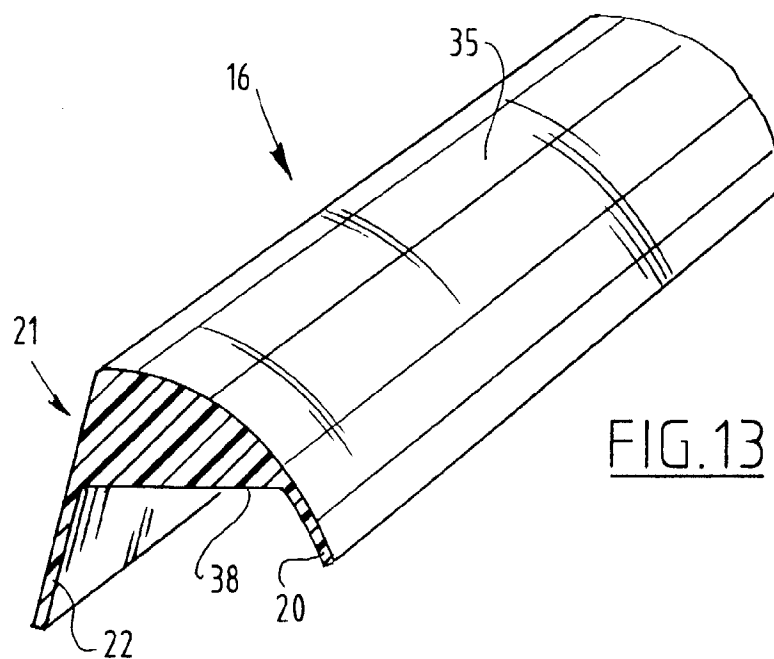


FIG. 13

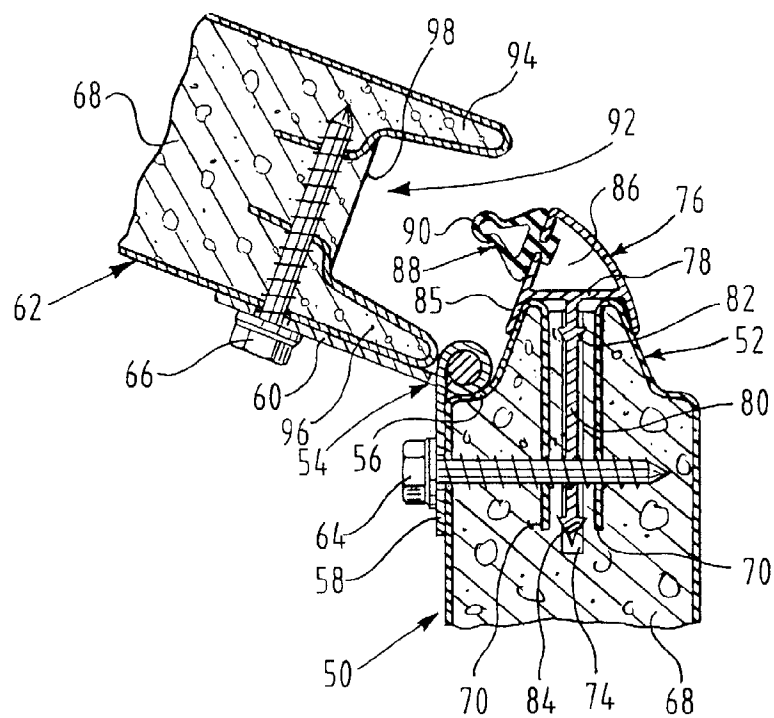


FIG. 14

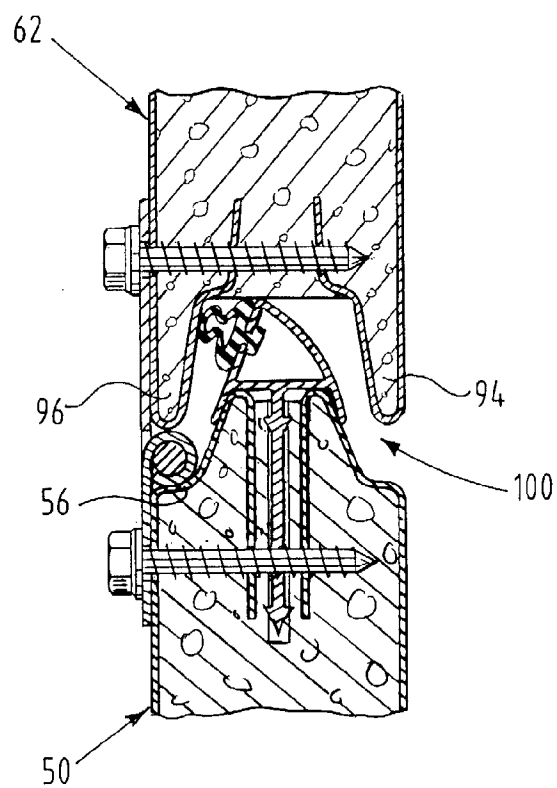


FIG. 15



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 0307

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE 40 19 569 A (GUTTMANN) 2 January 1992 * column 1, line 31 - column 2, line 41; figures *	1-5,7-18	E06B3/48
X	EP 0 416 152 A (DÖRING) 13 March 1991 * column 1, line 35 - column 4, line 25 * * figures 1-4 *	1-18	
X	EP 0 381 663 A (MEWALD GESELLSCHAFT) 8 August 1990 * column 1, line 47 - column 4, line 29; figure *	1,3-5, 7-18 2	
X	EP 0 666 402 A (PNEDER BRANDSCHUTZTORE) 9 August 1995 * the whole document *	1-9, 12-18	
X	DE 44 30 744 A (DÖRING) 14 March 1996 * column 1, line 26 - column 2, line 24 * * column 2, line 51 - column 4, line 2 * * column 4, line 34 - column 5, line 8 * * figures *	1,3,5,7, 8,12-18	TECHNICAL FIELDS SEARCHED (Int.Cl.6) E06B
X	EP 0 394 691 A (NIEMETZ TORSYSTEME) 31 October 1990 * column I, line 53 - column 3, line 7 * * column 5, line 42 - column 11, line 12 * * figures *	1,5-10, 16-18	
X	DE 89 15 709 U (NIEMETZ TORSYSTEME) 29 May 1991 * page 6, line 34 - page 7, line 5 * * page 9, line 19 - page 12, line 22 * * figures 1,2,8,9 *	1,5-8,12	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 May 1998	Examiner Depoorter, F
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			

EPO FORM 1503 03/92 (P4/C01)