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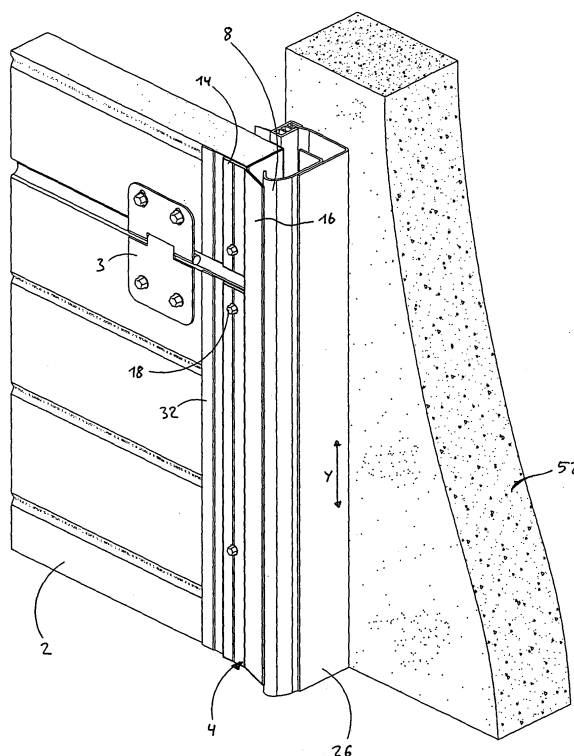
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(54) **Door with protection element**

(57) Door, in particular a sectional door, comprising at least one panel arrangeable at at least one guiding element and one or more protection elements, wherein said panel having guide means being in engagement or engageable with said guiding element for guiding said

panel during displacement along said guiding element, wherein said one or more protection elements having a first portion and a second portion, said first portion is to be fixedly mounted to said panel and said second portion is to be brought substantially in contact with said guiding element at least over a part of the displacement path.

FIG. 1



Description

[0001] The present invention relates to a door, in particular a sectional door. These doors are generally formed by at least one panel, which is mounted to a building structure, wherein the connection to the building structure can be achieved either by a hinge, so that the door is hingedly mounted, or by a rail assembly, so that the door is linearly displaceable.

[0002] US 3,347,305 A relates, for example, to an over-head roll-up door construction, having a plurality of hinged sections. These sections or panels are provided with roller members at their distal end sections, which are adapted to travel on conventional curved tracks. By moving between an open and a closed position, a gap is formed between adjacent panels. By the formation and closure of such a gap, a potential source of danger is given, as serious injury may result, if a finger is captured in the gap, when the door is being closed. Thus, it is desired to provide a door construction, in which injury of the person is prevented.

[0003] Accordingly, it is an object of the present invention to provide a door, in particular a sectional door, which provides an enhanced protection against possible injuries.

[0004] This object is fulfilled by a door panel, in particular a sectional door panel, having the features disclosed in claim 1, by a door according to claim 14. Preferred embodiments of the invention are subject of the dependent subclaims.

[0005] According to the invention, a door panel, in particular a sectional door panel is provided, comprising at least one panel arrangeable at at least one guiding element such as a guide rail and one or more protection elements, wherein said panel having guide means being in engagement or engageable with said guiding element for guiding said panel during displacement along said guiding element, wherein said one or more protection elements having a first portion and a second portion, said first portion is to be fixedly mounted to said panel and said second portion is to be brought at least partly substantially in contact with said guiding element at least over a part of the displacement path.

[0006] Accordingly, the danger of injuries is reduced as the guide means and/or its engagement with the guiding element is at least partly covered by the protection element thus reducing the risk of external matter, such as finger, being introduced therebetween. Moreover, the protection element further improves the sealing against wind, water and other external matter such as dust in particular from from the outside of the building or the like.

[0007] The door panel is preferably a sectional door panel, which can be used for a sectional door which is formed of a plurality of generally horizontally extending sections or panels, each of which typically extends from one side of the door opening to the other side. The top section of each panel is attached to a lower section of an adjacent panel. This attachment is provided preferably

by means of hinges or the like. Further sections can be mounted thereto in the same manner. The panel is arrangeable at at least one guiding element. The guiding element may be formed as a rail, a shaft or the like, which extends substantially parallel to the opening and closing direction of the door, i.e. substantially parallel to the displacement path of the door panels.

[0008] The panel is arrangeable at the guiding element such as a rail or rail system via guide means, which are in engagement or engageable with said guiding elements. That is, the geometric and functional configuration of the guide means is substantially adapted to the geometric and functional configuration of the guiding element.

[0009] Thereby, in order to achieve a guidance substantially along the displacement path of the door panels, an engagement between the guiding element such as a rail and the guide means such as a wheel can be provided. The protection element is preferably mounted at its first portion to one or more door panels. Advantageously, the first portion of the protection elements is arranged at the distal ends of the panels. It can also extend over more than one panel, wherein the protection element is preferably at least in the area between two adjacent panels flexible, so that two subsequent panels can be hinged or swivelled with respect to each other.

[0010] The one or more protection elements may be arranged at those panels, which are adapted to close a door opening. That is, by use of the door as a sectional door of the over-head type, the protection elements may be arranged from the bottom of the door (i.e. the lowest panel) to a height of preferably about 1,5 m, more preferably be about 1,8 m and most preferably about 2,5 m, so that a person cannot be injured.

[0011] In a preferred embodiment, the protection elements are arranged at those panels, which cover the complete door opening. The first portion of the one or more protection elements is fixedly mounted to the panel. That is, no relative motion or movement between the protection elements and the respective panel is provided.

[0012] The second portion of the protection elements is to be at least partly brought substantially in contact with the guiding element at least over a part of the displacement path. That is, the second portion of the protection element is displaced with respect to the guiding element, when the door is in movement (i.e. opened and closed). The second portion can be brought into contact with the guiding element only over a part of the displacement path of the door, i.e. door panels. That is, in a preferred embodiment, the second portion is substantially brought into contact with portions of the guiding element, which are substantially arrangeable or arranged at the door opening. That is, in use as a sectional door of the over-head type, the second portion is brought substantially in contact with a portion of the guiding element, which is arranged substantially vertically. The second portion can contact the guiding element directly or indirectly, i.e. by means of a further element such as a sealing

member, which is at least partly arrangeable therebetween.

[0013] Preferably, said guide means is at least partially covered by said protection element. Advantageously, the protection element extends substantially parallel to the displacement direction of the door panel, i.e. of the guide means. In other words, a portion or section of the guide means is preferably covered, which is oriented substantially perpendicular to the displacement direction of the guide means.

[0014] More preferably, said protection element covers at least a portion of said guide means, which is adapted to face a room or building's inner side. That is, preferably, the protection element is arranged with respect to the guide means so, that at least a portion of the guide means arranged rectangularly with respect to the displacement direction thereof is covered by the protection element. Moreover, advantageously, by providing a protection element, which covers at least a portion of said guide means, adapted to face a room or building's inner side, a door panel is provided, which advantageously prevents injury of a person contacting the door panel from the room inner side.

[0015] In a preferred embodiment, said second portion of said protection element extends substantially parallel or at an angle between about 2° and about 100°, preferably between about 5° and about 45° and most preferably about 10° to the panel widthwise extension. The "widthwise extension" of the panel is in particular defined as the extension of a panel, which is oriented substantially perpendicular to the displacement direction of the door panel. That is, preferably, the protection element extends substantially parallel or inclined with respect to the rear and/or front face of the panel.

[0016] In a preferred embodiment, said first portion of said protection element is at least partially mounted to a rear face of said panel, so that said first portion at least partially extends substantially parallel to the panel widthwise extension. Alternatively or additionally, said first portion of said protection element is at least partially mounted to an end face of said panel, so that said first portion preferably at least partially extends substantially perpendicular to said panel. In an embodiment, in which the first portion of said protection element is at least partially mounted to an end face and to a rear face of the panel, the first portion is substantially formed as a corner element, which preferably at least partially covers the end face and rear face of the panel.

[0017] In a further preferred embodiment, the first portion of the protection element is formed as a bead, which is mounted to said panel at or adjacent an end face thereof. That is, the bead of the protection element is adapted to substantially extend parallel to the displacement direction of the panel. In other words, the first portion, i.e. the bead, of the protection element may be accommodated in a groove or notch, which is provided preferably at the rear face and/or end or side face of the panel.

[0018] Preferably, said protection element is formed

by a preferably flexible or elastic or resilient elastomeric strip (e.g. made of rubber). Thus, the protection element is advantageously flexible, so that tolerances of manufacturing of one of the guide means, guiding element or protection element and/or relative displacements therebetween can be advantageously compensated.

[0019] Advantageously, the protection element is formed of and/or coated with a material, which can easily slide on the guiding element, i.e. a material having a low frictional coefficient.

[0020] In a further preferred embodiment, said guide means is arranged at an end face of said panel. That is, the guide means may be directly or indirectly mounted to the end face of the panel. In other words, the guide means substantially extend from the end face of the panel, so that preferably no portion of the guide means is facing the rear or front face of the panel.

[0021] Preferably, said guide means is formed by a sliding element or a rotatable element, such as a roller, drum, wheel or the like, rotationally secured or mounted to a shaft, which is preferably mounted to an end face of said panel. That is, the guide means may be formed by a sliding element, which is fixedly (non-moveable) mounted to the panel. However, preferably, the guide means is formed by a rotational roller, by which frictional forces during displacement of the panel are reduced. Preferably, the shaft is mounted to the end face of the panel, so that the shaft and/or the guide means are substantially aligned with the panel (i. e. its widthwise extension).

[0022] In a further preferred embodiment, said guide means further comprises a plate member having at least a first leg portion for housing said shaft. Moreover, preferably, said plate member having a second leg portion, which is arranged at an angle different from 0° or 180°, preferably arranged substantially perpendicular to said first leg portion. Thus, the plate member may be formed as a corner element, which preferably at least partially covers the rear face and/or front face and end face of the panel. In a preferred embodiment, one of the first and second leg portions may be integrally formed with the first portion of the protection element.

[0023] Preferably, said first or second leg is formed as a first hinge leg arranged at the panel and hingedly connectable with a second hinge leg arranged at a subsequent panel. Thus, advantageously, the plate member additionally provides the function of a hinge, so that no further hinges between two subsequent panels are necessary.

[0024] Further, according to the invention, there is provided a door, in particular sectional door, comprising at least one panel, particularly according to the invention or a preferred embodiment thereof, arranged or to be at least one guiding element such as a rail or rail system, and one or more protection elements, wherein said panel having guide means such as a roller, drum, wheel or the like, being in engagement with said guiding element for guiding said panel during displacement along said guiding elements, wherein said one or more protection ele-

ments having a first portion and a second portion, said first portion is to be fixedly mounted to said panel and said second portion is to be at least partly brought substantially in contact with said guiding element at least over a part of the displacement path.

[0025] Thus, a door is provided, which advantageously prevents injury of a person, as contact between the person and the guide means is prevented. Of course, all features and advantages of the inventive door panel can be also applied to the inventive door.

[0026] In a preferred embodiment, the guiding element has a curved or bent section, which is covered by a cover element. That is, the cover element is preferably arranged in a plane, in which the displacement path of the guide means lies or in a respective parallel plane. Advantageously, the cover element is adapted to cover the end face of the panels at least in the area of the bent section of the guiding element.

[0027] Further, according to the invention, a cover element or protective element for covering at least an end face of at least one panel of a door, in particular a sectional door, is provided, wherein the cover element is substantially plate-shaped and having an edge, which length or extension is adapted to the length or extension of an end face of the panel to be covered during displacement over a curved displacement path. Preferably, the extension of the edge is about 1.1 to about 1.9 times, preferably about 1.4 times the extension of the an end face of the panel.

[0028] These and other objects, features and advantages of the present invention will become more apparent upon reading of the following detailed description of preferred embodiments and accompanying drawings. It should be understood that even though embodiments are separately described, single features thereof may be combined to additional embodiments.

Fig. 1 is a partial perspective view of an embodiment of the door according to the present invention.

Fig. 2 is a partial sectional view of fig. 1.

Fig. 3 is a partial sectional view of a second embodiment of the door according to the invention.

Fig. 4 is a partial sectional view of a third embodiment of the door according to the invention.

Fig. 5 is an exploded perspective view of guide means according to the invention.

Fig. 6 is a perspective view of a further embodiment of guide means according to the invention.

Fig. 7 is a partial perspective view of a further embodiment of the door according to the invention

[0029] Fig. 1 shows a partial perspective view of the door according to the present invention. The door comprises preferably a plurality of door panels 2. Protection elements 4 are fixedly mounted at distal ends of the panels 2. The protection element 4 is adapted to slidingly cover at least a portion of guide means 6, which are adapted to guide the panel 2 during displacement along

a guiding element 8.

[0030] The door comprises at least one panel 2 for substantially closing a door opening 50 of a building structure 52. By use of the door as a sectional door, a plurality of panels 2 are provided, which are arranged in an edge-to-edge-relationship, hingedly connected by means of hinges 3, hinge-like members provided unitarily or integrally with the panels 2 or the like. The sectional door may be used as folding door, in which the door opening 50 is opened and closed by substantially horizontal movement of the door, i.e. of the door panels 2. Moreover, the sectional door may be of the rolled-type, where when the door is opened the panels are successively rolled over an axis. However, preferably, the sectional door may be employed in door systems of the overhead-type. In these door systems, the panels 2 are moved from a vertical position, i.e. in the door opening 50, to a horizontal position, i.e. a substantially perpendicular to the door opening plane. These door systems are typically employed in garages, industrial building structures or the like.

[0031] The panels 2 may be formed of wood or the like. However, preferably, the panels 2 may comprise one shell or two metal or plastic sheet shells. Between these latter two sheet metal or plastic shells, an insulation material may be provided. This insulation can be either glued to the shells or it is introduced into the shells by foaming (e.g. PU-foam). This results in a high stability of the panels 2 combined with a low weight and good insulation properties. The sheet metal or plastic shells may be of substantially identical design or shape, thereby simplifying their manufacture. Thus, a panel 2 being symmetrical is preferably provided. The connection between the sheet metal or plastic shells or elements may be achieved alternatively by means of a snap connection or other kind of mechanical connection.

[0032] As shown in Figs. 2 - 4, the panel 2 having guide means for guiding the panel 2 during displacement along the guiding element 8. The guide means 6 preferably comprise at least one rotatable element 10, such as a roller, drum, wheel or the like. The rotatable element 10 is adapted to translate or move in or at a guiding element 8, which might be formed as a rail element. The guiding element 8 is preferably adapted to at least partially encapsulate or surround the rotatable element 10 in order to prevent displacement of the rotatable element 10 in a plane substantially normal or perpendicular to the translational movement direction of the rotatable element 10 (perpendicular to the plane of the panel 2 and/or lying therein). In other words, the inner configuration of the guiding element 8 is substantially adapted to the outer configuration of the rotatable element 10. The rotatable element 10 is arranged substantially following the opening and closing motion of the door, i.e. the door panels 2. In order to guide the door into a substantially horizontal position by use of the door as a sectional door of the overhead-type, the guiding element 8 extends from a substantially vertical position to a substantially horizontal

position. Therefore, by the guiding element 8, the position of the door or panels 2 in its opened and closed state with respect to the door opening 50 is defined.

[0033] The rotatable element 10 may be formed as a rotatable element, which is rotatably arranged via mounting means, such as a shaft 12, at the panel 2. The rotatable element 10 can be formed of any material, preferably an elastomeric material, such as a rubber or any other polymeric material. The rotatable element 10 may comprise an elastomeric body or outer surface, wherein within the elastomeric body a resin cage could be formed for housing a bearing, so that the rotatable element 10 is rotatably mounted to the door panel 2 via the shaft 12. However, the guide means 6 may comprise alternatively or additionally a sliding element for guiding the panel 2 along the displacement path thereof, wherein the sliding element is preferably non-rotatably arranged at the panel 2.

[0034] Also a pair of rotatable elements 10 may be provided (not shown), wherein the rotatable elements 10 can be arranged substantially perpendicular to each other. That is, their axes of rotation are preferably arranged in a substantially perpendicular relationship. Thus, by the pair of rotatable elements, the door panel 2 can be guided in two (perpendicular) directions. The rotatable element 10 is to be mounted to the panel 2 via a shaft 12. The shaft 12 may be mounted directly to the panel. For example, the shaft may be embedded in the panel by foaming or moulding a distal end portion of the shaft 12, which is opposite to the rotatable element 10, into the panel interior. However, the shaft 12 can be also mounted indirectly to the panel 2, as described later.

[0035] In the embodiment shown in Figs. 1 and 2, the protection element 4 comprises a first portion 14 and a second portion 16. As can be seen in Fig. 1, the protection element 4 is formed as a substantially elastomeric strip. However, alternative geometric configurations may be employed as well. A separate strip may be provided for each panel 2, so that a plurality of protection elements 4 is needed for a sectional door having more than one panel 2. However, the protection element 4 may extend over a plurality of panels 2, wherein the protection element 4 is at least in the area of two adjacent panels 2 preferably elastomeric. The first portion 14 of the protection element 4 is to be attached or mounted to the panel 2. The first portion 14 may be mounted to the panel 2 by means of screws 18. However, it may be also attached to the panel 2 by alternative means, such as welding, gluing, riveting or the like. In a preferred embodiment, the first portion 14 of the protection element 4 may be formed integrally with the structure of the panel 2 (e.g. by seam crimping of a metal shell of the panel with the first portion 14). This may be done during the endless forming of the panel 2. The second portion 16 of the protection element 4 is at least partially brought into contact with the guiding element 8. Therefore, the gap between the guiding element 8 and the panel 2 is at least partially covered by the second portion 16 of the protection element 4. In a preferred

embodiment, at least the second portion 16 of the protection element 4 may be formed by a resilient material, so that tolerances of manufacturing and/or differences in the relative arrangement of the guiding element 8 and panel 2 can be compensated. Thus, preferably permanent contact between the second portion 16 of the protection element 4 and the guiding element 8 is ensured. The protective element 4 may be further advantageously reinforced by a reinforcement element, such as a metal plate or the like. The reinforcement element can be arranged within the protective element 4 (e.g. by molding of the protective element material around the reinforcement element) or attached thereto. It can be preferably provided at the first portion 14 and/or the second portion 16, wherein the preferably flexible section between the first and second portion 14, 16 is not provided with the reinforcement element.

[0036] In the embodiments shown in Figs. 2, 3 and 4, the second portion 16 of the protection element 4 extends at an angle α with respect to the widthwise extension x of the panel 2. The angle α is preferably between about 2° and about 100° , more preferably about 5° and about 45° at most preferably about 10° . However, when displacing the guide means 6 to the center of the end face 20 of the panel 2, i. e. to the room outer side u , the second portion 16 of the protection element 4 may be also arranged substantially parallel to the widthwise extension x of the panel 2.

[0037] In the embodiment shown in Fig. 3, the first portion 14 of the protection element 4 is at least partly mounted to the end face 20 of the panel 2. Alternatively, the first portion 14 of the protection element 4 may be also formed as a corner element, which is at least partially mounted to the end face 20 as well as a rear face 22 of the panel. Thus, a combination of the embodiment shown in figs. 2 and 3 is provided. In the embodiment shown in fig. 4, the first portion 14 of the protection element 4 is formed as a bead 24. The bead 24 is adapted to substantially extend parallel to the displacement direction y of the panel 2. The bead 24 is housed in a recess, a groove, a notch, a slot or the like. However, in a preferred embodiment, the bead may be also embedded in the panel interior material, i.e. the foam. The bead 24 is preferably mounted to said panel 2 at or adjacent the end face 20 thereof.

[0038] In all embodiments shown in Figs. 2, 3 and 4, the protection element 4 may be directly embedded in the (inner) material of the panel 2. However, in a preferred embodiment, the protection element 4 is preferably detachably mounted to the panel 2. In a further preferred embodiment, the protection 4 is indirectly mounted to the panel 2, i.e. by means of an interposed element (such as a later described plate member 32).

[0039] The guiding element 8 can be directly or indirectly via a fixing element 26 mounted to the building structure 52. At the room outer side u , an outer sealing or outer protection element 28 is provided. The outer protection element 28 is attached to the fixing element 26

on its first portion. However, the first portion of the outer protection element 28 may be also attached to the building structure 52. The second portion of the outer protection element 28 is preferably in contact with the front face 30 and/or and face 20 of the panel 2. Thus, when displacing the panels, motion or movement between the second portion of the outer protection element 28 and the panel 2 is given. However, in an alternative embodiment, the outer protection element 28 may be also fixedly mounted to the panel 2, wherein a portion of the outer protection element 28 is contactable with the fixing elements 26 and/or the building structure 52. Thus, substantially the same effect as provided by the protection element 4 is given for the outer protection element 28 at the room or building's outer side.

[0040] Fig. 5 shows an embodiment of the guide means 6. The guide means 6 comprise a plate member 32, which is adapted to house the rotatable element 10 and shaft 12. The plate member 32 comprises a first leg portion 34 and a second leg portion 36. The second leg portion 36 is arranged substantially perpendicular to the first leg portion 34, such that the first leg portion 34 and second leg portion 36 form a plate member 32 having the configuration of a corner element. In the embodiment shown in fig. 5, the rotatable element 10 is mounted via adjusting means 38 to the first leg portion 34. The adjusting means 38 are advantageously provided for adjusting the position of the rotatable element 10 with respect to the thickness direction z of the panel 2 (cf. Fig. 1). In a preferred embodiment, the plate member 32, i.e. the second leg portion 36 is formed as a first hinge leg of one panel 2. Therefore, a second hinge leg 40 of a subsequent panel may be hingedly connected with the plate member 32. In a alternative embodiment, also the first leg portion 34 may be utilized as the first hinge leg.

[0041] The embodiment shown in Fig. 6 is a simplified version of the embodiment shown in Fig. 5 of the guide means 6. In this embodiment, the plate member 32 having also a first leg portion 34 and a second leg portion 36. In this embodiment, the first leg portion 34 is provided on a front or rear surface of the second leg portion 36, not at the edge, as shown in Fig. 5. The first leg portion 34 extends basically normal or perpendicular to the second leg portion 36. In both embodiments shown in Figs. 5 and 6, the first leg portion 34 and/or second leg portion 36 may be integrally formed with the first portion 14 of the protection element 4.

[0042] Fig. 7 shows a partial perspective view of the door according to a preferred embodiment of the invention, wherein a cover element 42 is provided. The cover element 42 is preferably employed in door systems, in which the door panels 2 are displaced between an opened position and a closed position, which is oriented inclined, in particular substantially perpendicular, to the opened position (e. g. in garages, industrial building structures or the like). Thus, the guiding element 8 is bent in order to guide the panels between these two positions. Thus, during displacement of the panels 2, the panel 2

being adjacent to the bent section of the guiding element 8 deviates from the guiding element 8, so that a gap 44 results between the bent section of the guiding element 8 and the respective panel 2. In other words, at least a portion of the bent section of the guiding element 8 is than placed outside or beyond the panel plane resulting in the gap 44, which allows entry of foreign matters preferably in the widthwise direction x therein. In order to avoid the entry of foreign matter, in particular the injury of a person, the cover element 42 is preferably arranged at the bent portion of the guiding element 8. Advantageously, the geometric configuration of the cover element 42 is substantially adapted to the respective configuration of the guiding element 8. The cover element 42 is preferably adapted to cover the end face 20 of the panel 2 during displacement between the opened and closed position of the door in the bent area of the guiding element 8. Thus, contact of the end face 20 and/or the guide means 6 with foreign matter, such as a person, from the room inner side is prevented.

[0043] The above described embodiments of the present invention may be employed in a sectional door, in particular of the overhead type, or in other kind of doors, opening in a different way, such as in a horizontal manner. By the provision of a door panel having one or more protection elements according to the invention, a reliable and efficient protection against injury of a person from at least the room inner side is ensured.

Reference numerals

[0044]

2	panel
3	hinge
4	protection element
6	guide means
8	guiding element
10	rotatable element
12	shaft
14	first portion
16	second portion
18	screw
20	end face
22	rear face
24	bead
26	fixing element
28	outer protection element
30	front face
32	plate member
34	first leg portion
36	second leg portion
38	adjusting means
40	second hinge leg
42	cover element
44	gap
50	door opening
52	building structure

u room outer side
 v room inner side
 x widthwise extension
 y displacement direction
 z thickness direction
 α angle

Claims

1. Door panel, in particular sectional door panel, arrangeable at at least one guiding element (8) such as a rail, comprising:

one or more protection elements (4), and guide means (6) being engageable with said guiding element (8) for guiding said panel (2) during displacement along said guiding element (8),

wherein said one or more protection elements (4) comprises a first portion (14) and a second portion (16), said first portion (14) is to be fixedly mounted to said panel (2) and said second portion (16) is to be brought substantially in contact with said guiding element (8) at least over a part of the displacement path.

2. Door panel according to claim 1, wherein said guide means (6) is at least partially covered by said protection element (4).
3. Door panel according to one of the claims 1 or 2, wherein said protection element (4) covers at least a portion of said guide means (6), adapted to face a room inner side (v) of the door.
4. Door panel according to one of the preceding claims, wherein said second portion (16) of said protection element (4) extends substantially parallel or at an angle between about 2° and 100°, preferably about 5° to 45° and most preferably about 10° to the panel widthwise extension (x).
5. Door panel according to one of the preceding claims, wherein said first portion (14) of said protection element (4) is at least partially mounted to a rear face (22) of said panel (2), so that said first portion (14) at least partially extends substantially parallel to the panel widthwise extension (x).
6. Door panel according to one of the preceding claims, wherein said first portion (14) of said protection element (4) is at least partially mounted to an end face (20) of said panel (2), so that said first portion (14) preferably at least partially extends substantially perpendicular to said panel widthwise extension (x).
7. Door panel according to one of the claims 1 - 4,

wherein said first portion (14) of said protection element (4) is formed as a bead (24), which is mounted to said panel (2) at or adjacent an end face (20) thereof.

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8. Door panel according to one of the preceding claims, wherein said protection element (4) is formed by a preferably flexible or resilient elastomeric strip.

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9. Door panel according to one of the preceding claims, wherein said guide means (6) is arranged at an end face (20) of said panel (2).

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10. Door panel according to one of the preceding claims, wherein said guide means (6) is formed by a sliding element or rotational element (10); rotationally secured to a shaft (12), which is preferably mounted to an end face (20) of said panel (2).

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11. Door panel according to claim 10, wherein said guide means (6) further comprising a plate member (32) having at least a first leg portion (34) for housing said shaft (12).

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12. Door panel according to claim 11, wherein said plate member (32) having a second leg portion (36), which is preferably arranged substantially perpendicular to said first leg portion (34).

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13. Door panel according to claim 11 or 12, wherein said first or second leg portion (34, 36) is formed as a first hinge leg arranged at said panel (2) and hingedly connectable with a second hinge leg (40) arranged at a subsequent panel.

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14. Door, in particular sectional door, comprising at least one panel (2) according to one of the preceding claims arranged at the at least one guiding element (8) such as a guide rail.

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15. Door according to claim 14, wherein said guiding element (8) having a curved section, which is covered by a cover element (42).

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FIG. 1

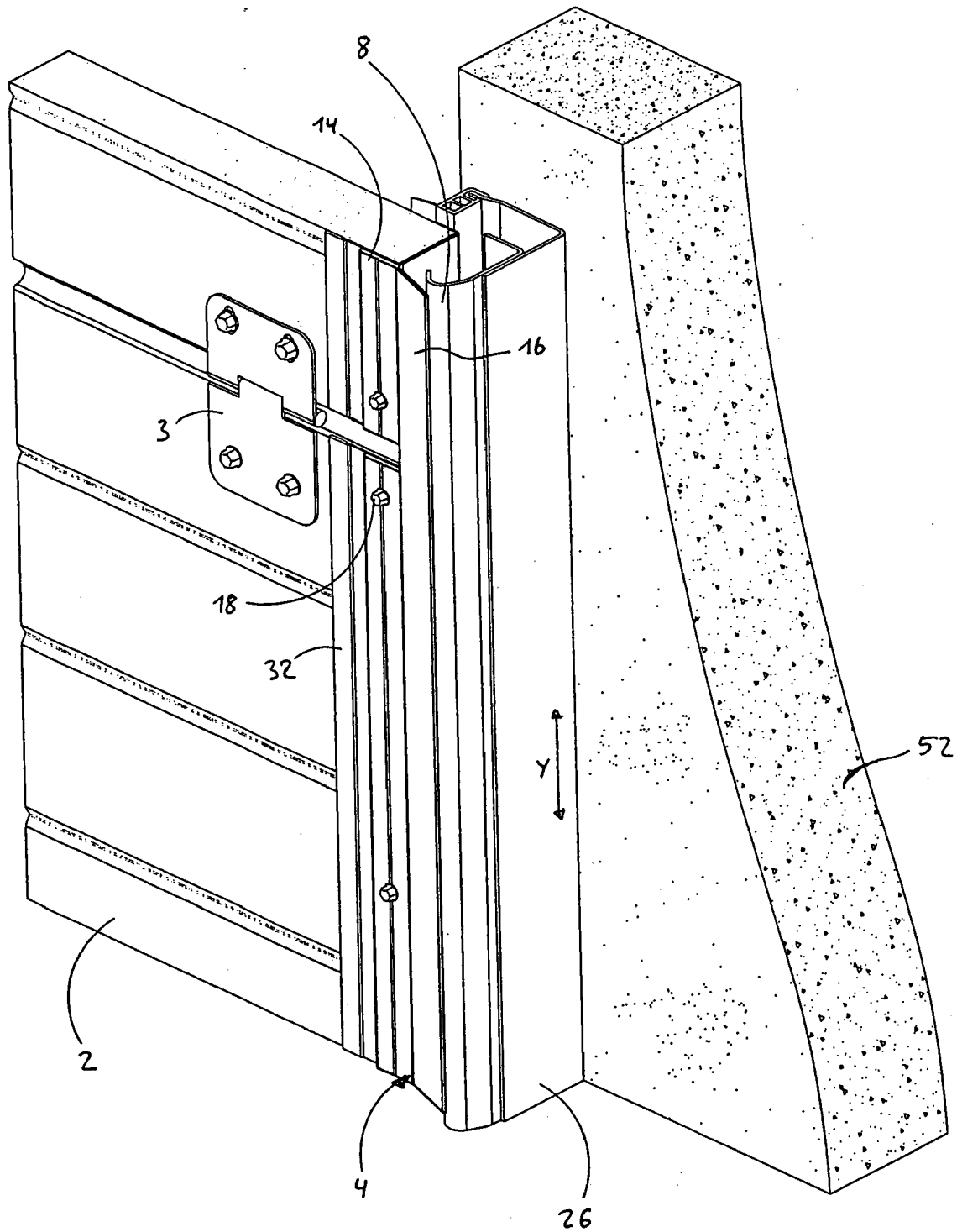


FIG. 2

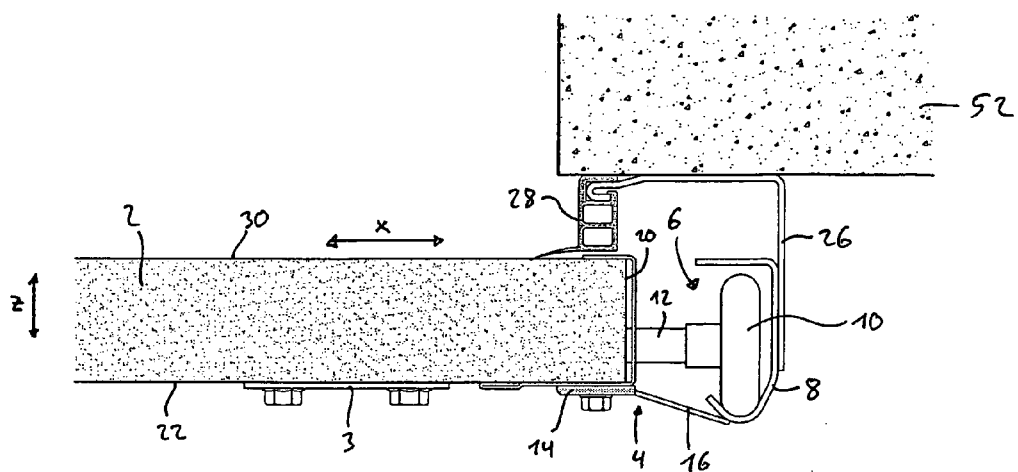


FIG. 3

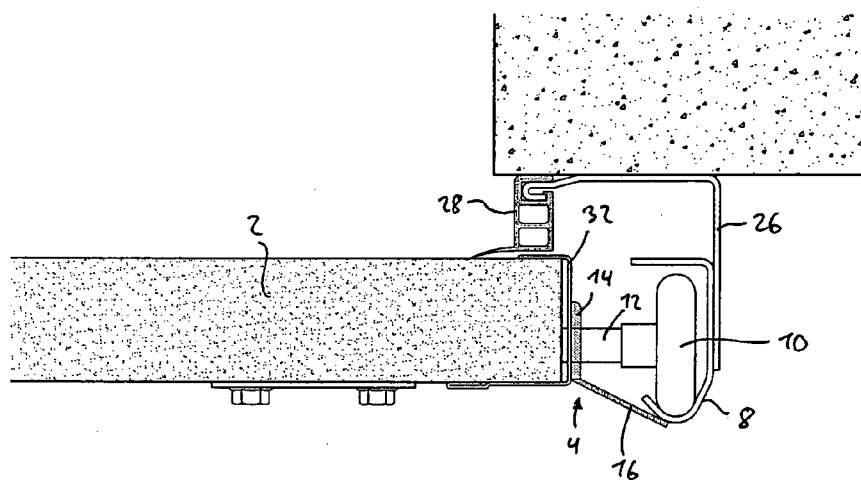


FIG. 4

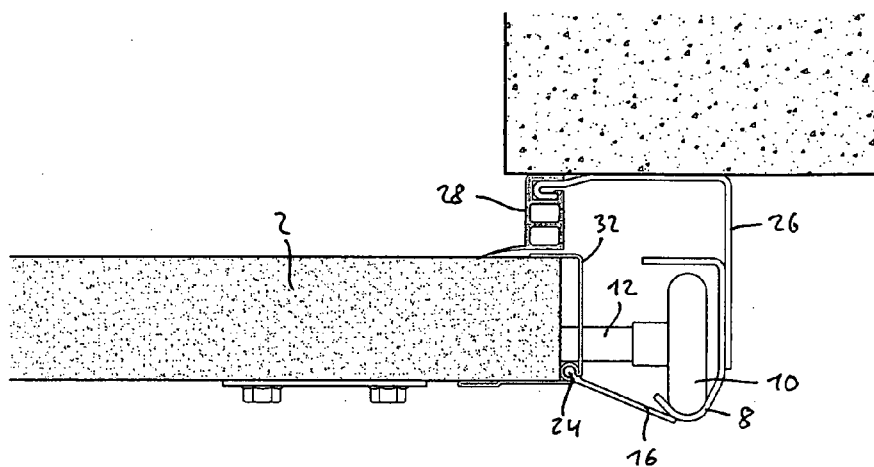


FIG. 5

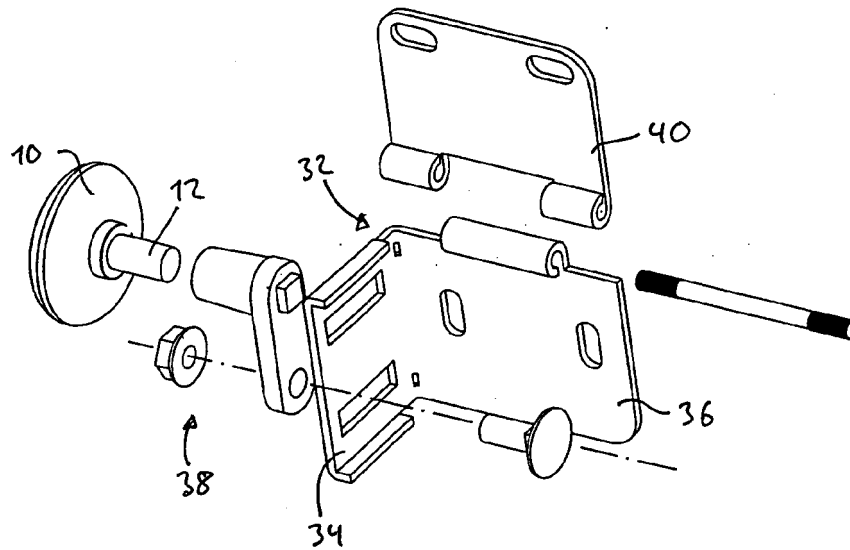


FIG. 6

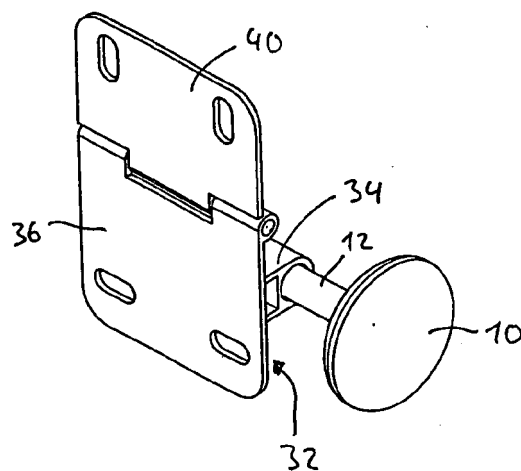
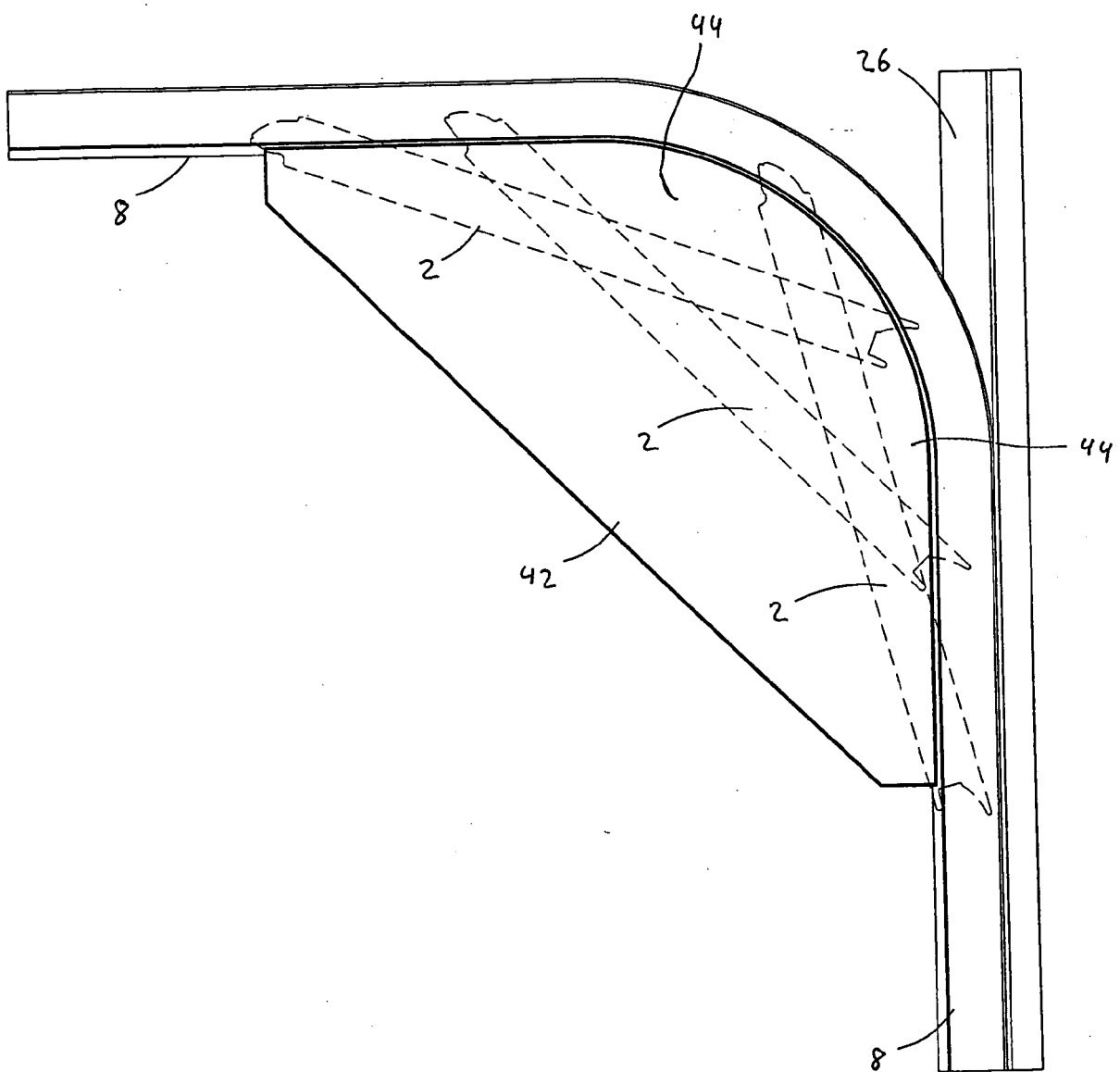


FIG. 7





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 02 5203

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