

PLASTIC DOOR FRAME AND METHOD OF MOUNTING THE SAME

The present invention relates to a plastic door frame and a method of mounting the same, and more particularly to a door frame structure which may be easily assembled and mounted on the wall after installation of a threshold.

As a general rule, before mounting a door frame, which may be made of plastics, aluminum or wood, a door hole is formed at a selected position of the wall. Metal sheets or plates (also known as hook clamps) are embedded at the rear side of the door frame to secure it to the wall. As for the conventional method of mounting the door frame, it essentially consists of providing a door hole in the wall, fitting an inverted-U shaped door frame provided with metal sheets or plates in the door hole and securing the door frame to the wall by means of the metal sheets or plates, and laying a threshold after the door frame is fitted in place. In the conventional method, the concrete used to lay the threshold after the door frame is mounted may stain the door frame and it is troublesome to clean up. Besides, there are usually gaps or clearances formed between the door frame and the wall which need to be filled up with concrete. Undue filling work may cause pressure on the door frame which may tend to deform in shape, and is hence unable to match a door to be hinged thereon.



A primary object of the present invention is to provide a plastic door frame and a method of mounting the same, in which a threshold is laid at the bottom of a door hole formed in the wall prior to the mounting of the door frame so that concrete work may be done at one time. The door frame consists of packing rails, outer rails, link rails and seal strips. The outer rails are fitted on the packing rails which are secured to the wall and their connection is adjusted so that the outer rails are precisely perpendicular or level to the door frame. Link rails are provided to conceal the clearances formed between the wall and the outer rails and securing the outer rails to the packing rails. The seal strips are provided with ornamental surfaces for concealing the link rails. By means of the method of mounting the door frame according to the present invention, the drawbacks in the prior art are mitigated; the threshold is laid prior to mounting of the door frame so that the door frame may not be stained by concrete or caused to deform.

The structure and operational characteristics of the present invention and its advantages as compared to the known state of the prior art will be better understood from the following description, in conjunction with the attached drawings which show illustratively but not restrictively an example of an embodiment of the present invention.



In the drawings:

Fig. 1 is an exploded schematic view of the structural parts of the present invention;

5 Fig. 2 is a sectional view of the structural parts of the present invention in an assembled state;

Fig. 3 is a perspective view of the assembled structural parts of the present invention with a partial cross section, and

10 Fig. 4 is an outer perspective view of the door frame according to the present invention.

With reference to Fig. 1, the plastic door frame according to the present invention comprises a plurality of packing rails 1, a plurality of outer rails 2, a plurality of link rails 3, and plurality of seal strips 4. These plastic structural parts are assembled together to form an integral door frame, they are cut at 45 degrees at appropriate positions so that they may form an inverted-U shaped door frame with both lateral rails perpendicular to the top rail of the door frame. After construction work of a door hole in the wall and a threshold 51 are completed, the structural parts of the door frame may be mounted on the wall one by one. Any necessary repair work or trimming to be done on the door hole and the threshold 51 or painting of the walls may be proceeded before mounting of the door frame according to the present invention, and there is no need to repair

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or trim any defects in the wall after installation of the door frame as in the prior art. The structure of the parts of the door frame and method of mounting the same according to the present invention are described in detail hereinbelow.

Each packing rail 1 is a substantially hollow frame structure having a recess 11 provided in a middle portion thereof or at a pre-determined suitable position. The recess 11 may be provided with a longitudinally oriented groove 111 for penetration of screws 12 therethrough. The screws 12 may be driven into expansion sleeves 6 pre-planted in an inner wall of the door hole to achieve secure connection and positioning. It should be understood that there are various ways of locking the packing rail 1 to the inner wall 5 of the door hole, e.g., expansion screws may be used instead of expansion sleeves, and they are not discussed in detail herein.

Each outer frame 2 is substantially a stepped hollow rail structure. An outer surface thereof has a baffle strip 22, and an inner surface thereof has an internal diameter equivalent to or slightly smaller than the external diameter of the packing rail 1, so that the outer rail 2 may fit onto the packing rail 1 (as shown in Fig. 2). By adjusting the extent the outer rail 2 is fitted onto the packing rail 1, precise horizontal or

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vertical position of the door frame may be obtained, so that after the outer rails 2 are fitted in place, a door frame with precise right angles may be achieved. The outer rails 2 at both lateral sides of the door hole are each provided with an opening 21 having a width corresponding to that of the threshold 51 so that the openings 21 of the outer rails 2 may fit perfectly onto the threshold 51.

Each link rail 3 is a substantially elongated rail structure having an inverted-U shaped cross section. The link rail 3 is also provided with a protruding hook strip 31 at either lateral side thereof for concealing a clearance A formed between the outer rail 2 and the inner wall 5 due to adjustment of the outer rail 2 on the packing rail 1. The link rail 3 is arranged properly against the outer rail 2 and the inner wall 5 so as to conceal the clearance A, and a plurality of locking elements, such as screws 7, may be driven through the link rail 3 and the outer rail 2 into a side wall of the packing rail 1, so that the outer rail 2 may be securely positioned and the clearance A is completely covered up.

Each seal strip 4 is provided with a retaining groove 41 at either lateral side thereof for receiving the hook strip 31 of the link rail 3. An outer surface of the seal strip 4 may be configured to have steps or



curves or other ornamental shapes so that, after it is properly coupled to the link rail 3, it may form an ornamental strip and completely conceals the link rail 3.

5 Steps of mounting the door frame comprising the above-described parts will be described hereinbelow:

(1) laying the threshold at a suitable position of the door hole;

10 (2) securing the packing rails onto the inner walls of the door hole by screws or other suitable locking elements;

(3) fitting the outer rails onto the corresponding packing rails and adjusting the depth of the outer rails on the packing rails so that the outer rails may be
15 horizontally or vertically oriented in a precise manner, and the openings at the lower ends of the outer rails disposed at the lateral sides of the door hole may fit perfectly onto the threshold;

(4) arranging the link rails on both lateral sides of
20 each outer rail such that they conceal the clearance formed between the inner wall and the outer rail, and driving securing elements through the link rail and the outer rail into the packing rail so that each outer rail is firmly locked and positioned;

25 (5) fitting the seal strips onto the link rails such that the hook strips at both lateral sides of each link

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rail are received in the retaining grooves at both lateral sides of each seal strip; and

(6) cutting the ends of the corresponding parts of the door frame according to the present invention at 45 degrees so that they may together form an inverted-U shaped frame structure with both side frames perpendicular to the top frame.

As the step of cutting the ends of the assembled parts of the door frame according to the present invention at 45 degrees is known in the art, it is not described in detail herein.

In the present invention, there is no need to provide metal sheets or plates at the rear side of the door frame to secure it to the wall as in the conventional method. Mounting of the door frame may be proceeded after the threshold is installed and the walls are plastered or painted, without the disadvantages in the conventional method in which the door frames are may be marred by concrete or plaster or even caused to deform in shape. The present invention provides a clean and simple way of mounting a door frame at less cost and labor. If desired, cracks such as those between the packing rails and the wall or the threshold may be filled with silicon gel for sealing purposes.

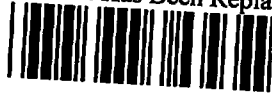
Although the present invention has been illustrated and described with reference to the preferred embodiment

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thereof, it should be understood that it is in no way limited to the details of such embodiment but is capable of numerous modifications.

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claims :

1. A plastic door frame structure comprising:

5 a plurality of packing rails, each of which is a suitably hollow rail structure and may be locked onto an inner wall of a door hole by means of a plurality of locking elements to be firmly secured thereto and positioned;

10 a plurality of inner rails, each of which is a stepped hollow rail structure having a stepped outer surface with a baffle strip and an inner surface with an internal diameter equivalent to or slightly smaller than an external diameter of each of said packing rails so that each of said outer rails may fit perfectly on each of said packing rails, each of two of said inner rails to be served as lateral sides of said door frame structure being provided with an opening having a width matching that of the threshold for fitting thereonto;

15 a plurality of link rails, each of which is an elongated strip having an inverted-U cross section and a protruding hook strip at either lateral sides thereof, two of said link rails being arranged on both lateral sides of one of said outer rail with said link rails pressing against both lateral sides of said outer rail and the wall, a plurality of locking elements being passed through each of said link rail and one of the lateral sides of said outer rail into a lateral side of

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one of said packing rails so that each of said outer rails may be firmly secured and positioned; and a plurality of seal strips, each of which having two retaining grooves disposed at both lateral sides thereof for receiving said hook strips of each of said seal rails so that they may be firmly connected, each of said seal strips having an outer surface configured into an appropriate shape so that, after said seal strips are fitted in place, they may conceal said link rails and act as ornamental strips.

2. A plastic door frame structure according to Claim 1, wherein each of said packing rails has a recess in a middle portion or a suitable portion thereof, said recess having a vertically oriented groove through which screws are driven to secure said packing rail to the wall.

3. A method of mounting a plastic door frame structure after a threshold has been properly fitted in place in a door hole, said method comprising the following steps of:

- (a) securing a packing rails onto an inner wall of the door hole by screws or other suitable locking elements;
- (b) fitting an outer rail onto said packing rail and adjusting the depth of said outer rail on said packing rail, so that said outer rail may be horizontally or vertically oriented in a precise manner and an opening

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formed in a lower end of said outer rail which serves as a lateral frame of the door frame structure may fit perfectly onto the threshold;

5 (c) arranging a link rail on either lateral side of said outer rail such that said link rail conceals a clearance formed between said inner wall and said outer rail, and driving a plurality of securing elements through said link rail and said outer rail into said packing rail so that said outer rail is firmly locked
10 and positioned;

(d) fitting a seal strip onto said link rail such that a hook strips at either lateral side of said link rail is received in a retaining groove at either lateral side of said seal strip; and

15 (e) cutting the ends of the corresponding parts of the assembled door frame according to the present invention at 45 degrees so that they may together form an inverted-U shaped frame with both lateral sides perpendicular to a top side.

20 4. A plastic door frame structure as hereinbefore described and illustrated with reference to the accompanying Figures 1 to 4.

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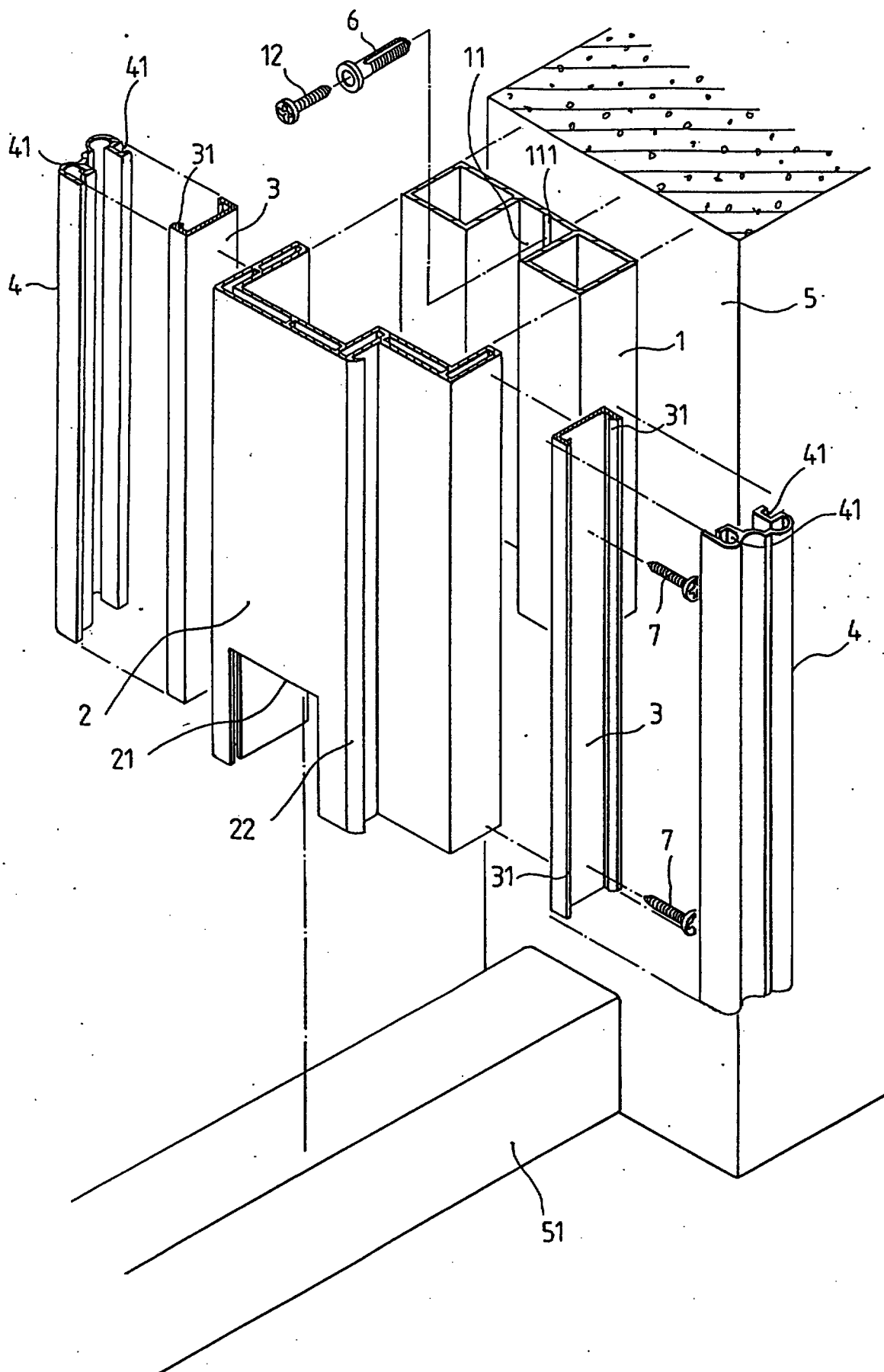


FIG. 1

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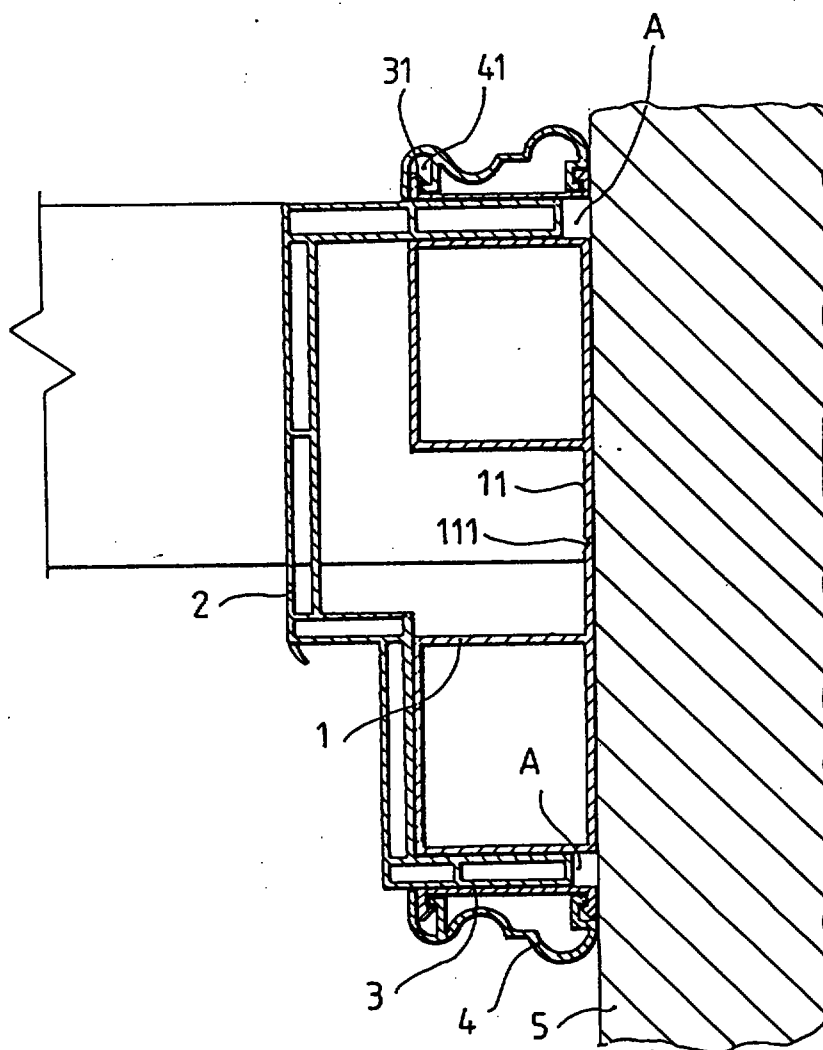


FIG. 2

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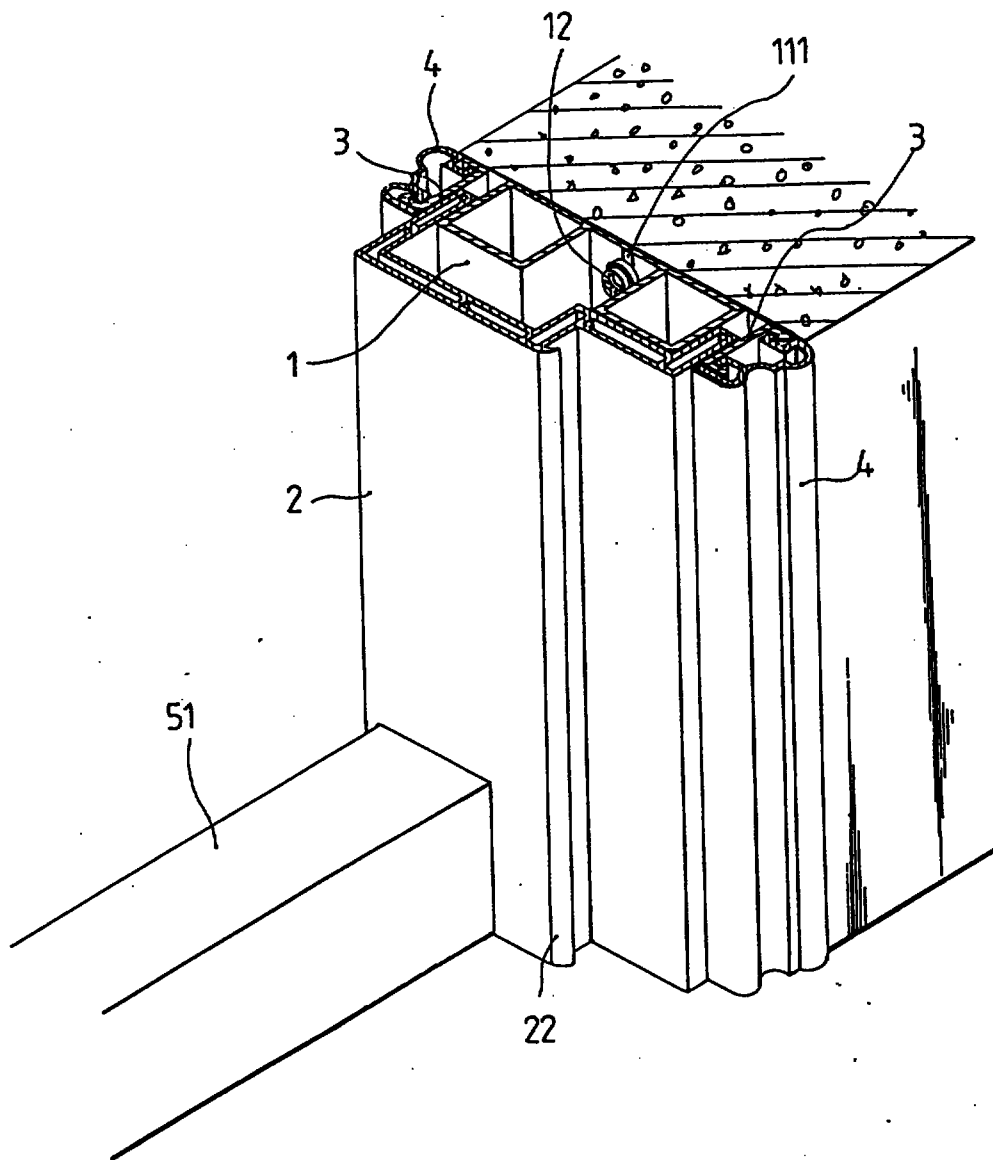


FIG. 3

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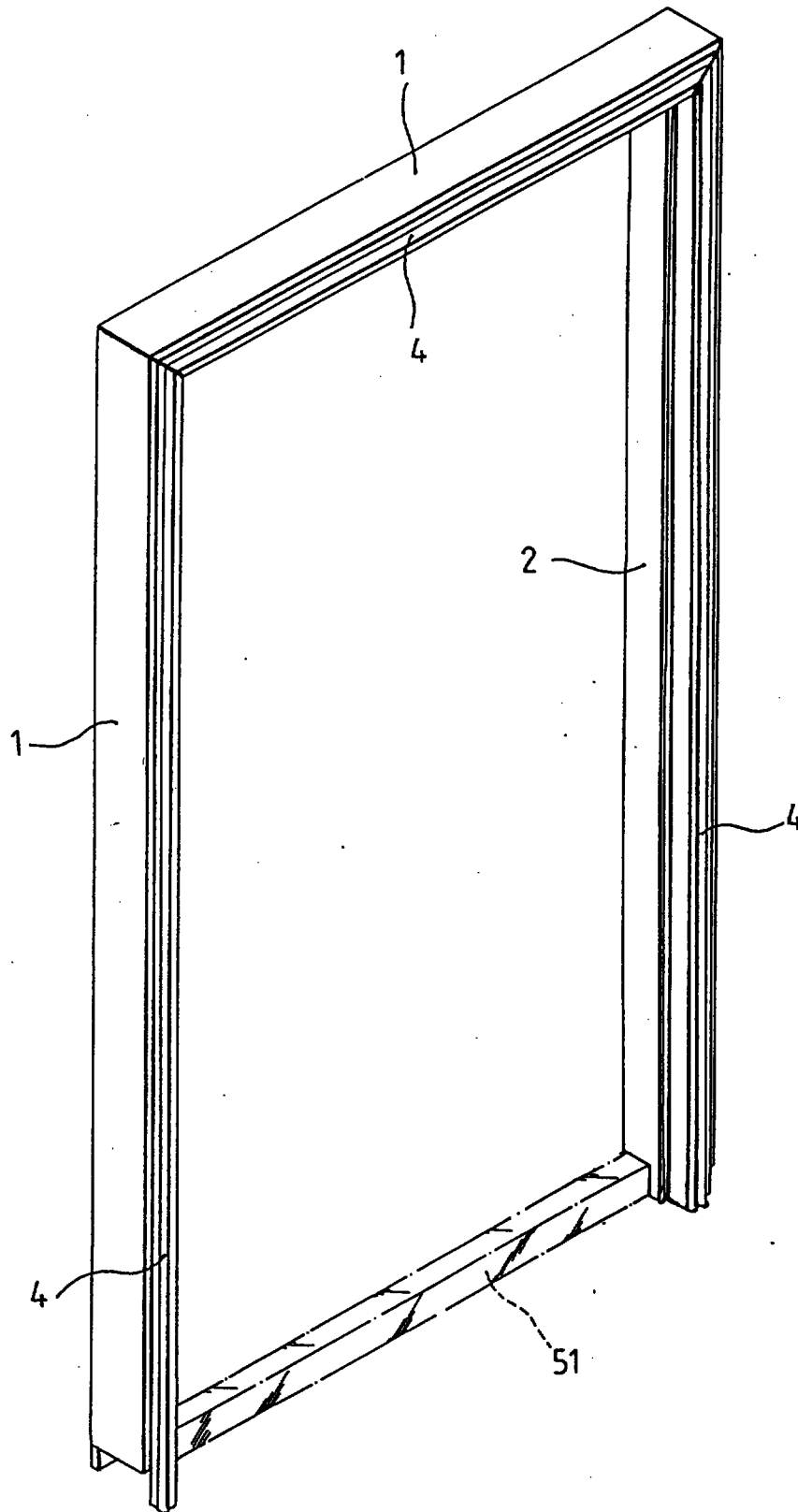


FIG. 4

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ABSTRACT

PLASTIC DOOR FRAME AND METHOD OF MOUNTING THE SAME

5 A plastic door frame structure and a method of mounting the same after a threshold is installed in a door hole includes fixing a packing rail on a wall of the door hole, fitting an outer rail on the packing rail 1 and adjusting the horizontal or vertical position of the outer rail 2 , arranging a link rail 3 at either lateral side of the outer rail such that the link rail
10 conceals a clearance formed between the outer rail 2 and the wall and passing screws through the link rail and the outer rail into the packing rail to keep the outer rail firmly in place, and fitting a seal strip onto the link rail 3 to accomplish an integral plastic
15 door frame, which is cut at 45 degrees at appropriate positions to obtain an inverted-U shaped door frame with the lateral sides perpendicular to the top side.

Figure 1 to accompany

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PLASTIC DOOR FRAME AND METHOD OF MOUNTING THE SAME

The present invention relates to a plastic door frame and a method of mounting the same, and more particularly to a door frame structure which may be easily assembled and mounted on the wall after installation of a threshold.

As a general rule, before mounting a door frame, which may be made of plastics, aluminum or wood, a door hole is formed at a selected position of the wall. Metal sheets or plates (also known as hook clamps) are embedded at the rear side of the door frame to secure it to the wall. As for the conventional method of mounting the door frame, it essentially consists of providing a door hole in the wall, fitting an inverted-U shaped door frame provided with metal sheets or plates in the door hole and securing the door frame to the wall by means of the metal sheets or plates, and laying a threshold after the door frame is fitted in place. In the conventional method, the concrete used to lay the threshold after the door frame is mounted may stain the door frame and it is troublesome to clean up. Besides, there are usually gaps or clearances formed between the door frame and the wall which need to be filled up with concrete. Undue filling work may cause pressure on the door frame which may tend to deform in shape, and is hence unable to match a door to be hinged thereon.

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5 A primary object of the present invention is to provide a plastic door frame and a method of mounting the same, in which a threshold is laid at the bottom of a door hole formed in the wall prior to the mounting of the door frame so that concrete work may be done at one time. The door frame consists of packing rails, outer rails, link rails and seal strips. The outer rails are fitted on the packing rails which are secured to the wall and their connection is adjusted so that the outer rails are precisely perpendicular or level to the door frame. Link rails are provided to conceal the clearances formed between the wall and the outer rails and securing the outer rails to the packing rails. The seal strips are provided with ornamental surfaces for concealing the link rails. By means of the method of mounting the door frame according to the present invention, the drawbacks in the prior art are mitigated; the threshold is laid prior to mounting of the door frame so that the door frame may not be stained by concrete or caused to deform.

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The structure and operational characteristics of the present invention and its advantages as compared to the known state of the prior art will be better understood from the following description, in conjunction with the attached drawings which show illustratively but not restrictively an example of an embodiment of the present invention.

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In the drawings:

Fig. 1 is an exploded schematic view of the structural parts of the present invention;

5 Fig. 2 is a sectional view of the structural parts of the present invention in an assembled state;

Fig. 3 is a perspective view of the assembled structural parts of the present invention with a partial cross section, and

10 Fig. 4 is an outer perspective view of the door frame according to the present invention.

With reference to Fig. 1, the plastic door frame according to the present invention comprises a plurality of packing rails 1, a plurality of outer rails 2, a plurality of link rails 3, and plurality of seal strips
15 4. These plastic structural parts are assembled together to form an integral door frame, they are cut at 45 degrees at appropriate positions so that they may form an inverted-U shaped door frame with both lateral rails perpendicular to the top rail of the door frame.
20 After construction work of a door hole in the wall and a threshold 51 are completed, the structural parts of the door frame may be mounted on the wall one by one. Any necessary repair work or trimming to be done on the door hole and the threshold 51 or painting of the walls may
25 be proceeded before mounting of the door frame according to the present invention, and there is no need to repair

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or trim any defects in the wall after installation of the door frame as in the prior art. The structure of the parts of the door frame and method of mounting the same according to the present invention are described in detail hereinbelow.

Each packing rail 1 is a substantially hollow frame structure having a recess 11 provided in a middle portion thereof or at a pre-determined suitable position. The recess 11 may be provided with a longitudinally oriented groove 111 for penetration of screws 12 therethrough. The screws 12 may be driven into expansion sleeves 6 pre-planted in an inner wall of the door hole to achieve secure connection and positioning. It should be understood that there are various ways of locking the packing rail 1 to the inner wall 5 of the door hole, e.g., expansion screws may be used instead of expansion sleeves, and they are not discussed in detail herein.

Each outer frame 2 is substantially a stepped hollow rail structure. An outer surface thereof has a baffle strip 22, and an inner surface thereof has an internal diameter equivalent to or slightly smaller than the external diameter of the packing rail 1, so that the outer rail 2 may fit onto the packing rail 1 (as shown in Fig. 2). By adjusting the extent the outer rail 2 is fitted onto the packing rail 1, precise horizontal or

vertical position of the door frame may be obtained, so that after the outer rails 2 are fitted in place, a door frame with precise right angles may be achieved. The outer rails 2 at both lateral sides of the door hole are each provided with an opening 21 having a width corresponding to that of the threshold 51 so that the openings 21 of the outer rails 2 may fit perfectly onto the threshold 51.

Each link rail 3 is a substantially elongated rail structure having an inverted-U shaped cross section. The link rail 3 is also provided with a protruding hook strip 31 at either lateral side thereof for concealing a clearance A formed between the outer rail 2 and the inner wall 5 due to adjustment of the outer rail 2 on the packing rail 1. The link rail 3 is arranged properly against the outer rail 2 and the inner wall 5 so as to conceal the clearance A, and a plurality of locking elements, such as screws 7, may be driven through the link rail 3 and the outer rail 2 into a side wall of the packing rail 1, so that the outer rail 2 may be securely positioned and the clearance A is completely covered up.

Each seal strip 4 is provided with a retaining groove 41 at either lateral side thereof for receiving the hook strip 31 of the link rail 3. An outer surface of the seal strip 4 may be configured to have steps or

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curves or other ornamental shapes so that, after it is properly coupled to the link rail 3, it may form an ornamental strip and completely conceals the link rail 3.

5 Steps of mounting the door frame comprising the above-described parts will be described hereinbelow:

(1) laying the threshold at a suitable position of the door hole;

10 (2) securing the packing rails onto the inner walls of the door hole by screws or other suitable locking elements;

(3) fitting the outer rails onto the corresponding packing rails and adjusting the depth of the outer rails on the packing rails so that the outer rails may be horizontally or vertically oriented in a precise manner, and the openings at the lower ends of the outer rails disposed at the lateral sides of the door hole may fit perfectly onto the threshold;

20 (4) arranging the link rails on both lateral sides of each outer rail such that they conceal the clearance formed between the inner wall and the outer rail, and driving securing elements through the link rail and the outer rail into the packing rail so that each outer rail is firmly locked and positioned;

25 (5) fitting the seal strips onto the link rails such that the hook strips at both lateral sides of each link

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rail are received in the retaining grooves at both lateral sides of each seal strip; and

(6) cutting the ends of the corresponding parts of the door frame according to the present invention at 45 degrees so that they may together form an inverted-U shaped frame structure with both side frames perpendicular to the top frame.

As the step of cutting the ends of the assembled parts of the door frame according to the present invention at 45 degrees is known in the art, it is not described in detail herein.

In the present invention, there is no need to provide metal sheets or plates at the rear side of the door frame to secure it to the wall as in the conventional method. Mounting of the door frame may be proceeded after the threshold is installed and the walls are plastered or painted, without the disadvantages in the conventional method in which the door frames are may be marred by concrete or plaster or even caused to deform in shape. The present invention provides a clean and simple way of mounting a door frame at less cost and labor. If desired, cracks such as those between the packing rails and the wall or the threshold may be filled with silicon gel for sealing purposes.

Although the present invention has been illustrated and described with reference to the preferred embodiment

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thereof, it should be understood that it is in no way limited to the details of such embodiment but is capable of numerous modifications.

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claims:

1. A plastic door frame structure comprising:

a plurality of packing rails, each of which is a suitably hollow rail structure and may be locked onto an inner wall of a door hole by means of a plurality of locking elements to be firmly secured thereto and positioned;

a plurality of inner rails, each of which is a stepped hollow rail structure having a stepped outer surface with a baffle strip and an inner surface with an internal diameter equivalent to or slightly smaller than an external diameter of each of said packing rails so that each of said outer rails may fit perfectly on each of said packing rails, each of two of said inner rails to be served as lateral sides of said door frame structure being provided with an opening having a width matching that of the threshold for fitting thereonto;

a plurality of link rails, each of which is an elongated strip having an inverted-U cross section and a protruding hook strip at either lateral sides thereof, two of said link rails being arranged on both lateral sides of one of said outer rail with said link rails pressing against both lateral sides of said outer rail and the wall, a plurality of locking elements being passed through each of said link rail and one of the lateral sides of said outer rail into a lateral side of



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one of said packing rails so that each of said outer rails may be firmly secured and positioned; and a plurality of seal strips, each of which having two retaining grooves disposed at both lateral sides thereof for receiving said hook strips of each of said seal rails so that they may be firmly connected, each of said seal strips having an outer surface configured into an appropriate shape so that, after said seal strips are fitted in place, they may conceal said link rails and act as ornamental strips.

2. A plastic door frame structure according to Claim 1, wherein each of said packing rails has a recess in a middle portion or a suitable portion thereof, said recess having a vertically oriented groove through which screws are driven to secure said packing rail to the wall.

3. A method of mounting a plastic door frame structure after a threshold has been properly fitted in place in a door hole, said method comprising the following steps of:

- (a) securing a packing rails onto an inner wall of the door hole by screws or other suitable locking elements;
- (b) fitting an outer rail onto said packing rail and adjusting the depth of said outer rail on said packing rail, so that said outer rail may be horizontally or vertically oriented in a precise manner and an opening



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formed in a lower end of said outer rail which serves as a lateral frame of the door frame structure may fit perfectly onto the threshold;

5 (c) arranging a link rail on either lateral side of said outer rail such that said link rail conceals a clearance formed between said inner wall and said outer rail, and driving a plurality of securing elements through said link rail and said outer rail into said packing rail so that said outer rail is firmly locked
10 and positioned;

(d) fitting a seal strip onto said link rail such that a hook strips at either lateral side of said link rail is received in a retaining groove at either lateral side of said seal strip; and

15 (e) cutting the ends of the corresponding parts of the assembled door frame according to the present invention at 45 degrees so that they may together form an inverted-U shaped frame with both lateral sides perpendicular to a top side.

20 4. A plastic door frame structure as hereinbefore described and illustrated with reference to the accompanying Figures 1 to 4.



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ABSTRACT

PLASTIC DOOR FRAME AND METHOD OF MOUNTING THE SAME

5 A plastic door frame structure and a method of mounting the same after a threshold is installed in a door hole includes fixing a packing rail on a wall of the door hole, fitting an outer rail on the packing rail 1 and adjusting the horizontal or vertical position of the outer rail 2 , arranging a link rail 3 at either lateral side of the outer rail such that the link rail 10 conceals a clearance formed between the outer rail 2 and the wall and passing screws through the link rail and the outer rail into the packing rail to keep the outer rail firmly in place, and fitting a seal strip onto the link rail 3 to accomplish an integral plastic 15 door frame, which is cut at 45 degrees at appropriate positions to obtain an inverted-U shaped door frame with the lateral sides perpendicular to the top side.

Figure 1 to accompany

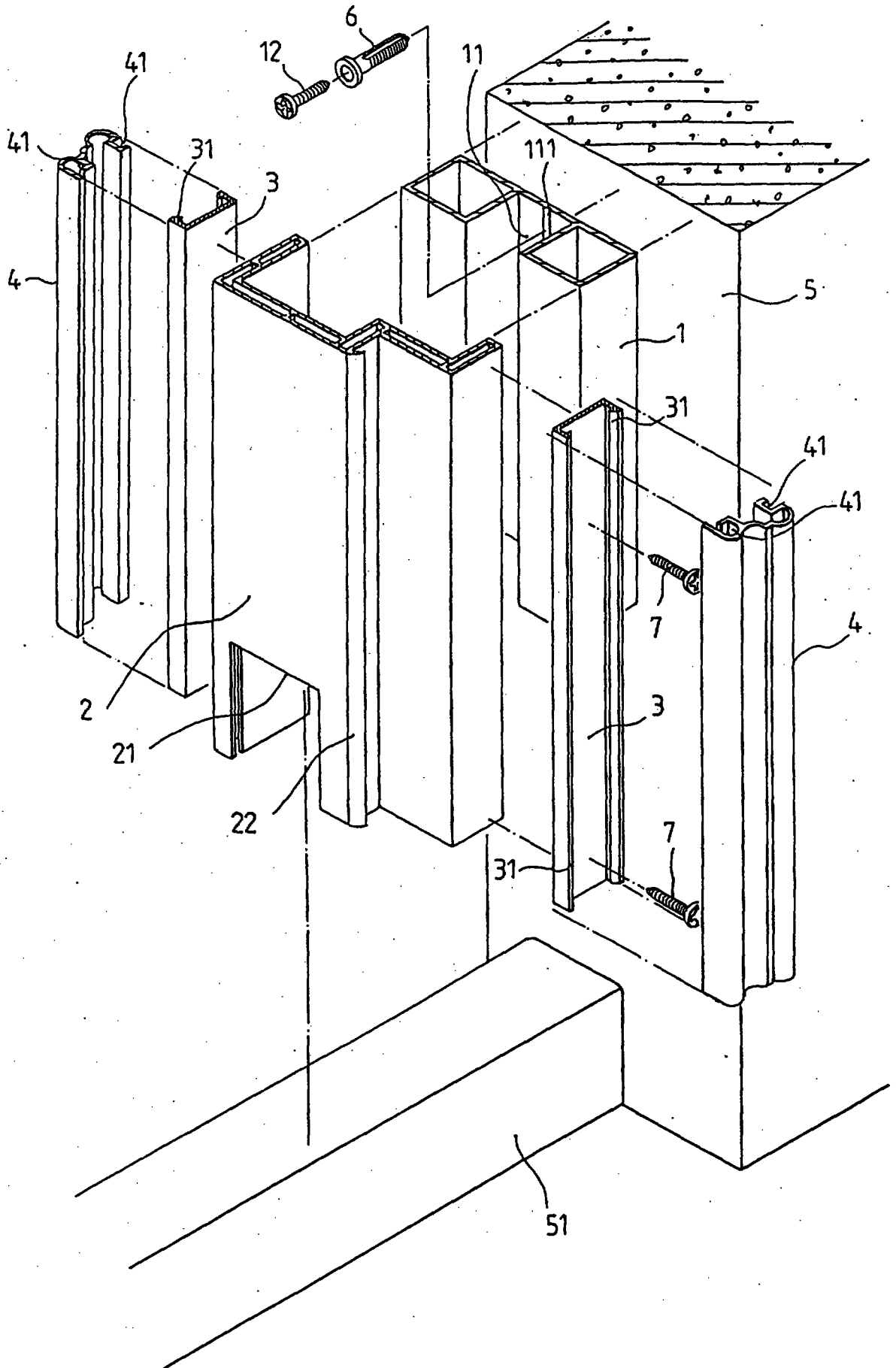


FIG. 1

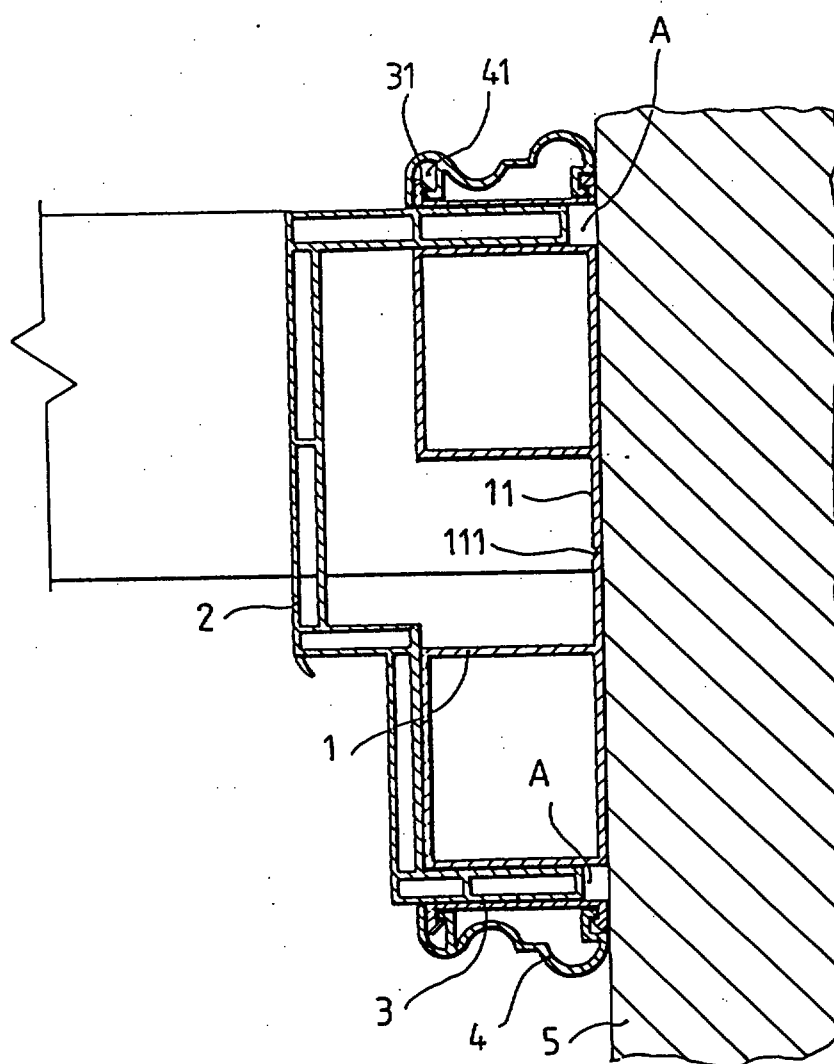


FIG. 2

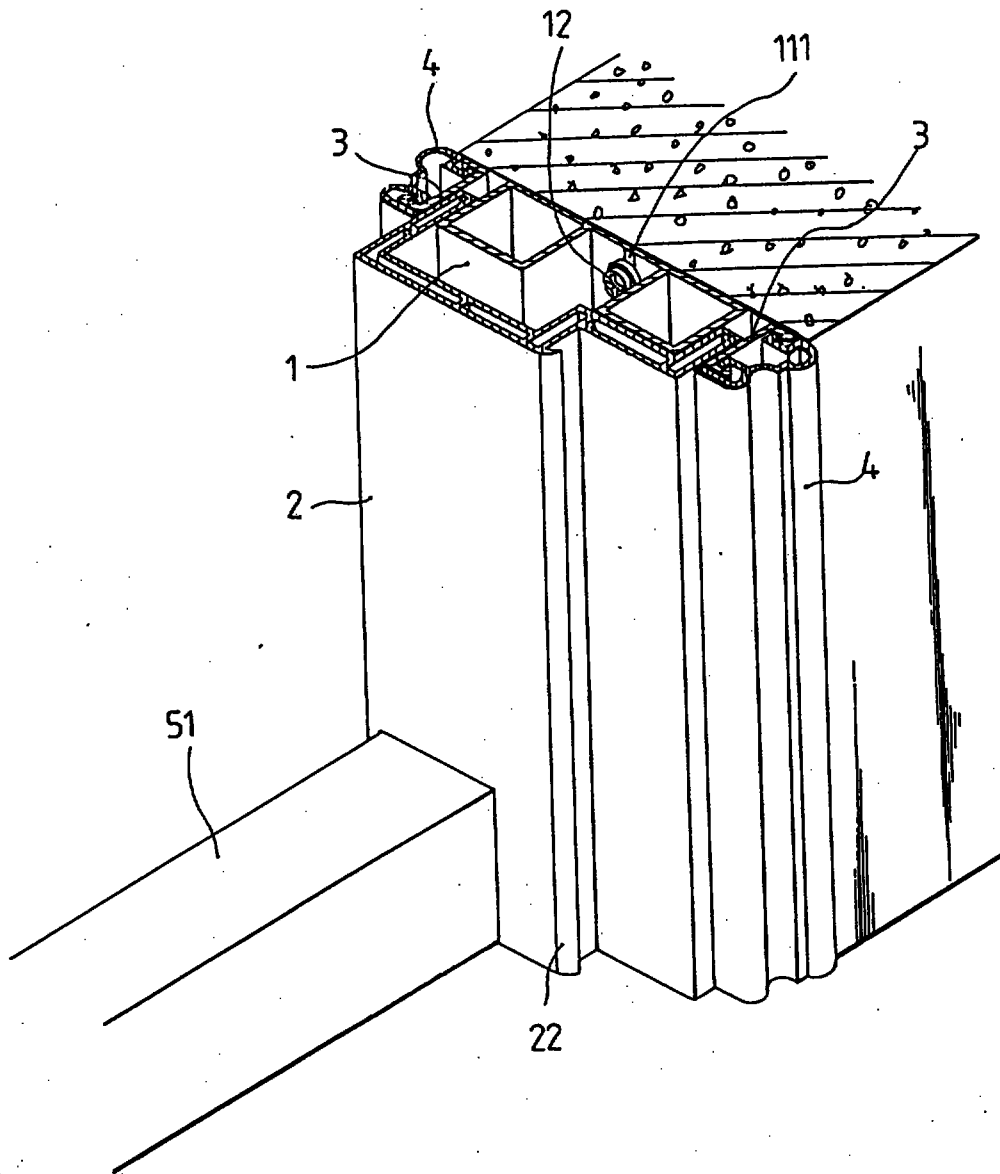


FIG. 3

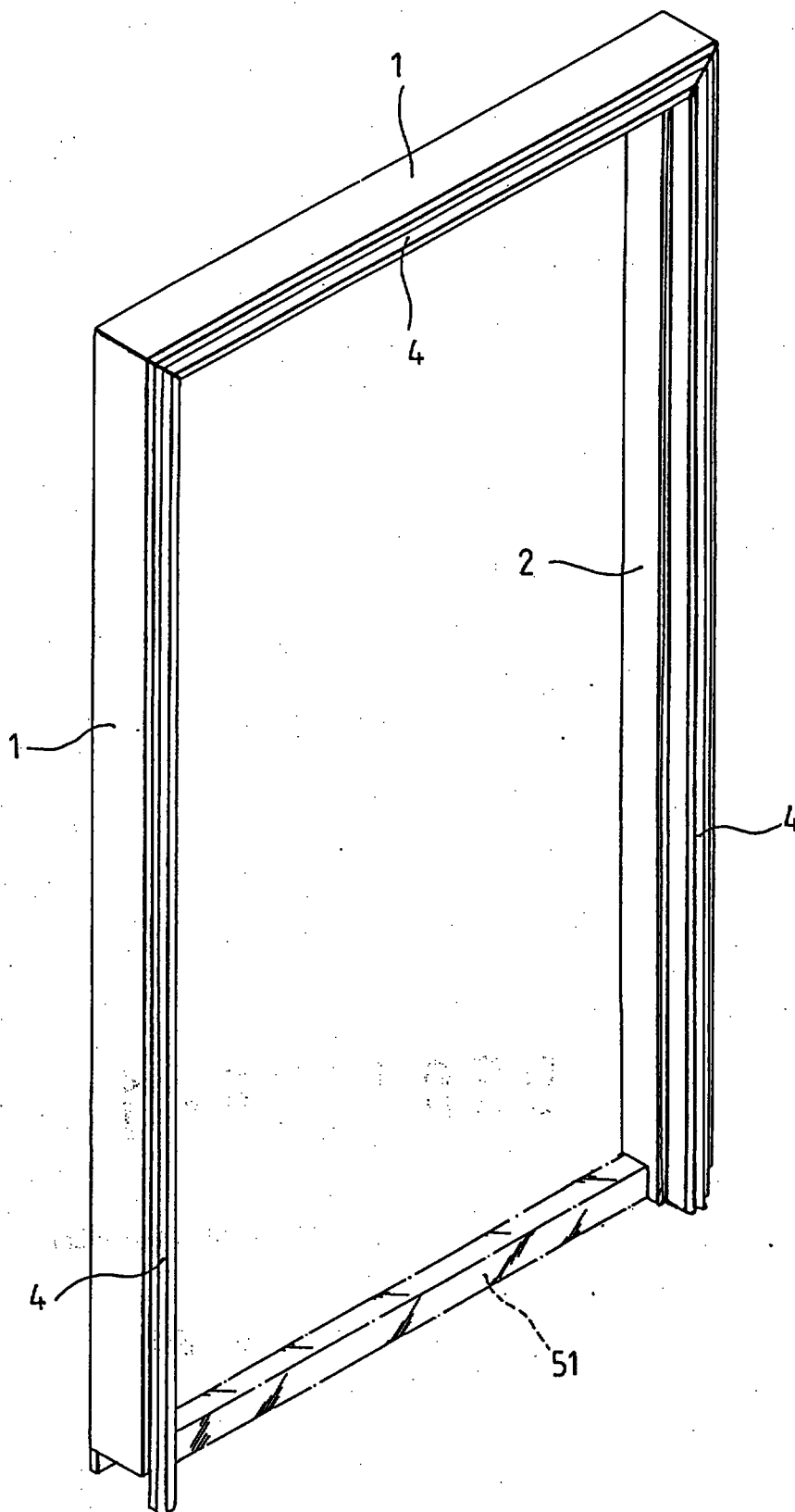


FIG. 4.