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(54) **Looking window structure in the fireproof door**

(57) A structure for a looking window casement of a fireproof door has a fireproof door, U-type reinforcement sheet with fixed pin, and a looking window frame clamped with glass sheet. The fireproof door has a cutting open place for looking window installing space, and the U-type reinforcement sheet with the fixed pin is fixed into the

fireproof core material between a mezzanine of fireproof door at the proper place of the circumference. The female sheet of looking window frame has female button to be placed on the cutting open place for looking window installing space and male sheet of looking window frame having male button clasped each other.

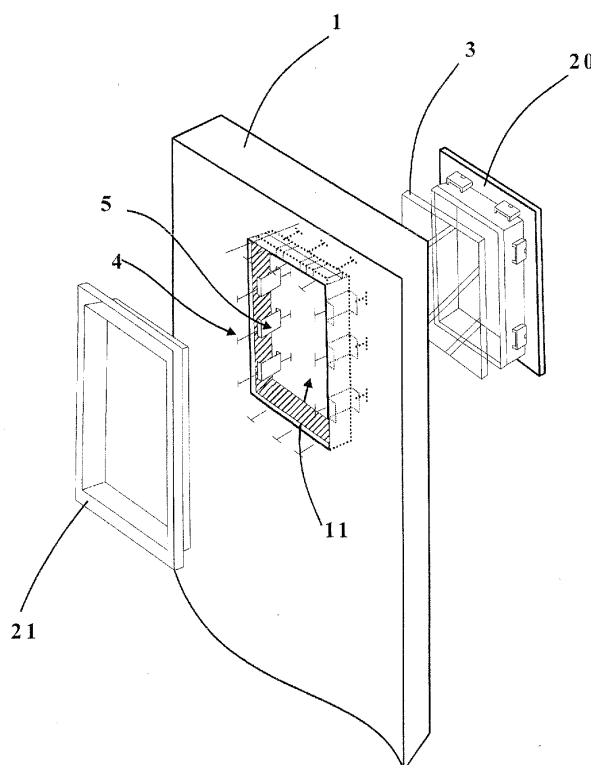


FIG.2

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a fireproof door system, having a looking window structure within a door casement. More particularly, the present invention relates to an improvement of a fireproof door system with a looking window structure, said structure is injection molding casement installed on the both sides of door to clamp the glass of the looking window, simultaneously the circumference of the space for installing said looking window equipped with a U-type reinforced board to reinforce the strength of the circumference of the looking window in the fireproof door. Not only it is to produce on large scale and to assemble easily and simply, but also the design of surface ornament of the fireproof door can be manifold.

BACKGROUND OF THE INVENTION

[0002] The traditional structures for a looking window casement in a fireproof door are often to use iron casement or wooden casement as the strip to fix the glass sheet in the looking window. Their installation and establishment are quite complicated. Further, the fixed screw is easily bared so as to impair with view. The painting on the surface of the iron casement or wooden casement is rather feddy and the production procedure and gradation are also rather complicated and time-consuming. The appearance of the glass frame strip is hard to be decorated. The production is unable to reach a large scale whereby to low down the price, which is the defects of the traditional frame strip.

DESCRIPTION OF PRIOR ART

[0003] U. S. Pat. No. 4,270,326 discloses a fireproof door having a fabric of ceramic or glass fibers attached to a metal frame and covered by facings. The fabric which also may be used as a fireproof mat consists of layers titanium-treated ceramic or glass fires felted together by similar needlelike fibers extending through an intermediate layer of fireproof particulate material. The design of said patent is taking into consideration of the core material of fireproof door board. Excellent in fireproof efficacy, however, the design of the looking window is not yet considered.

[0004] U. S. Pat. No. 5,020,292 discloses door constructions to be provided including a frame, a core, and on both the inner and outer faces of the core an iron plate at least 0.2 millimeters thick with a wooden layer adhesively secured to the outer surfaces thereof. Preferably the core provided is a material having superior heat insulating properties with a heat conductivity of between about 0.15 and 0.05 as well as a diffusion resistance at least 20 times greater than that of air. In a preferred embodiment, each of the iron plates has a wooden layer

adhesively secured to both the inner and outer surfaces thereof. Also, the design of the looking window is not yet considered.

[0005] U. S. Pat. No. 4,264,681 provides an improved process for making a multiple pane fire resistant window whose spaces are filed with an aqueous gel possessing multiple carbon bonds, wherein the improvement comprises placing the improvement comprises placing a thin layer of an adherence agent on the contact surface of the panes, prior to placing the aqueous gel in the spacing. Further, the design of the looking window is not yet considered.

[0006] U. S. Pat. No. 4,015,393 discloses a panel such as a door having a fire-resistant core and a frame encompassing the edge margins of the core. A method of making such a panel wherein the frame is prepared of frame portions which are united together in the frame. A method of forming the core in place within a frame, with the introduction of a hardenable material to within the confines of a frame, and permitting such material then to harden. A door skin or other covering is adhesively secured in place over faces of the panel. Further, the design of the looking window is not yet considered.

[0007] U. S. Pat. No. 4,332,111 discloses a fireproof window pane in which a glass plate having metallic wires incorporated therein is fitted in the groove of a mounting metal frame to a depth corresponding to at least about 1.6 times the thickness of the glass plate at least at its upper edge. Also provided is a mounting metal frame for mounting fireproof windowpane which has grooves for receiving the metallic wire-containing glass plate therein to the aforesaid depth. The fireproof window pane can withstand fire or high temperatures over a long period of time, and is useful for preventing spreading of a fire and for aiding in fire extinguishing activities. Though the fireproof window pane is installed, yet only circumference of the pane of one side is fixed with screw. The other side of the fireproof window pane is fixed with the frame strip. Such structure is asymmetrical design of door frame. The merit of this patent is excellent in fireproof efficacy, but the production procedure is too complicated to reach the easy installation and the efficacy of utility.

[0008] Another patent of U. S. Pat. No. 6,681,541 invented by the same inventor discloses a fireproof door assembly structure includes two molded door panels of compression molded skins having outer surfaces of a wood-grain appearance and flat edges around their four sides. These molded door panels are overlaid with each other to form a door with a hollow core. A rectangular frame seals the door panels and coincides with the flat edges of the door panels. A reinforcing part is provided between the panels in an area for attaching a handle to the door panels. A fireproof material core is formed between the door panels to produce the fireproof door, and top, left, and right edges of the rectangular frame have a groove for receiving a fireproof strip therein. However, the design of the looking window is not yet considered.

SUMMARY OF THE INVENTION

[0009] According to the present invention, it is an object to provide a structure for a looking window casement of a fireproof door, having a fireproof door, U-type reinforcement sheet with fixed pin, and a looking window frame clamped with glass sheet. The fireproof door has a cutting open place for looking window installing space, and the U-type reinforcement sheet with the fixed pin is fixed into the fireproof core material between a mezzanine of fireproof door at the proper place of the circumference. The female sheet of looking window frame has female button to be placed on the cutting open place for looking window installing space and male sheet of looking window frame having male button clasped each other.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

Fig. 1 is a partially enlarged view of three-dimension in accordance with looking window structure in the fireproof door of the prevent invention.

Fig. 2 is an explosive view of three-dimension in accordance with looking window structure in the fireproof door of the prevent invention.

Fig. 3 is a partially enlarged view with single glass sheet in accordance with looking window structure in the fireproof door of the prevent invention.

Fig. 4 is a partially enlarged view with double glass sheets in accordance with looking window structure in the fireproof door of the prevent invention.

Fig. 5 is a partially enlarged view of looking window frame in accordance with looking window structure in the fireproof door of the prevent invention.

Fig. 6 is a perspective view of U-type reinforcement frame with three-dimension in accordance with looking window structure in the fireproof door of the prevent invention.

Fig. 6-1 is a perspective view of another U-type reinforcement frame with three-dimension in accordance with looking window structure in the fireproof door of the prevent invention.

DETAILED DESCRIPTION OF THE INVENTION

[0011] In view of the product on the market of the design in the patents, all of them are not taken into consideration of the production line for the requirements of the production forthright, convenient in installation and building, structure strength and the usage of said fireproof door in match with the environment.

[0012] The present invention relates to an improvement in them and provides a production forthright, the circumference of looking window casement installed a U-type reinforced board to reinforce the strength of the board of fireproof door, the hollow between said casement and board of door is filled with fireproof filler, without

using the screw to lock together and being able to assemble the looking window of a fireproof door rapidly. The performance is illustrated as follows:

[0013] The present invention relates to a structure for a looking window casement of a fireproof door, having a fireproof door 1, U-type reinforcement sheet 5 with fixed pin 4, and a looking window frame 2 clamped with glass sheet 3. The fireproof door 1 has a cutting open place for looking window installing space 11, U-type reinforcement sheet 5 with the fixed pin 4 is fixed into the fireproof core material 11 between a mezzanine of fireproof door 1 at the proper place of the circumference, female sheet 20 of looking window frame having female button 203 to be placed on the cutting open place for looking window installing space 11 and male sheet 21 of looking window frame having male button 213 clasped each other.

[0014] Fig. 1 is a partially enlarged view of three-dimension in accordance with looking window structure in the fireproof door of the prevent invention. The fireproof door board 12 of the fireproof door 1 is installed with coarctation forming surface 200 of looking window frame 2 at a suitable place. The glass sheet 3 of looking window is clamped between the looking window 2.

[0015] Fig. 2 is an explosive view of three-dimension in accordance with looking window structure in the fireproof door of the prevent invention. A cut open place for looking window installing space 11 is located at the suitable place in the fireproof door 1, at the proper place of the circumference of the cut open place, U-type reinforcement sheets 5 are installed into the fireproof core material 10 of fireproof door 1, such as phenolic resin of organic matter, said U-type reinforcement sheets 5 are fixed from outside to pin through the fireproof door board 12 with the fixed pin 4, so as to cause the U-type reinforcement sheets 5 and the fireproof door board 12 to be fixed closely. In order to install glass sheet 3, a cut open place is made for looking window installing space 11 in the fireproof door 1. Thus, it will cause the fireproof door board 12 to be weak partially in the fireproof door 1. After the U-type reinforcement sheets 5 combined with the fireproof door board 12 closely, the defects of the weakness of local strength can be improved by installing the U-type reinforcement sheets 5 to reach the purpose and efficacy of reinforcing the structure of the fireproof door board 12.

[0016] The looking window frame 2 (referring to Figs. 1, 2, 3 and 5) is an injection molding casement forming with a female sheet 20 and male sheet 21. The structure of an injection molding is able to shorten the manufacturing process of the looking window frame 2 and to control the amounts to reach the purpose of the manufacture simply.

[0017] The surface of the female sheet 20 and the male sheet 21 of looking window frame 2 has the coarctation forming surface 200. Said coarctation forming surface 200 is able to form the ornament on the plastic material in advance, and then forming on the surface of the female sheet 20 and the male sheet 21 of looking window frame 2. Further, it also is able to form the ornament on the

plastic material first, then to form three-dimensional protruding ornament and then to pressure them on the surface of the female sheet 20 and the male sheet 21 of looking window frame 2.

[0018] The inner side of female sheet 20 has female button 203, also the inner side of male sheet 21 has male button 213. While installing the looking window frame casement, the inner part of the circumference of the female sheet 20 painting with the fireproof glue 6 and fireproof material with thermal expansion of graphite substance, the expansion strip is simultaneously installed into the circumference of the looking window installing space 11, then after the female sheet 20 painted with fireproof glue 6 is stuffed into the looking window installing space 11, the glass sheet 3 is placed on the female sheet 20, and then the inner part of the circumference of the male sheet 21 among the glass sheet, looking window frame and core material painting with the fireproof glue and fireproof material with thermal expansion of graphite substance, from the another side of fireproof door 1 to stuff into the looking window installing space 11, finally the male button 213 of male sheet 21 and female button 203 of female sheet 20 fasten each other and fixed on the fireproof door 1.

[0019] The top of female sheet 20 having a top female sheet 204 and the top of male sheet 21 having a top male sheet 214 (referring to Fig. 3) are able to let the fixed pin 4 be bared in the shelter of the surface of the fireproof door 1. Their bottom part also has bottom female sheet 205 and bottom male sheet 215 respectively. The glass sheet 3 is placed in their center. The circumferences of both sides of glass sheet are infilled with sealed fixing glue 7, and then said looking window frame is fixed on the fireproof door 1.

[0020] Under the processing, it is not to lock by using the screw to reach simple and quick processing method. Further, after completion of processing, there is no any nail-head and the head of fixed screw to be bared so as to harm the appearance.

[0021] Fig. 4 is perspective view of the looking window frame with double glass sheets in accordance with looking window structure in the fireproof door of the prevent invention. The circumference of space between the double glass sheets is installed with space block to separate said glass sheets and fastened with sealed fixing glue. The other procedure of the processing method is identical with those of the single glass sheet.

[0022] Please refer to Fig. 6, in case the fireproof core material 10 is a hardenable material of inorganic fireproof material such as calcium silicate board, pearl board (foam board), magnesia board, etc, it needs larger force to place the U-type reinforcement sheet 5 in. The front part of both sides in the U-type reinforcement sheet 5 is cut and punched into serration arrangement 51 with row pattern to convenience U-type reinforcement sheet 5 to be installed into fireproof core material 10. Further, it is able to cut and to punch the both sides of the U-type reinforcement sheet 5 having U-type reinforcement

groove 52, then the top parts of the both sides of U-type reinforcement sheet 5 are cut into the shape of the front tip part 53 so that said U-type reinforcement sheet 5 is placed into fireproof core material 10 formed with hardenable material more easily.

[0023] The above female sheet 20 and the male sheet 21 of looking window frame 2, under installation processing, are able to use fireproof tape instead of fireproof glue.

[0024] Since certain changes may be made in the above described invention without departing from the spirit and scope of as the invention herein involved, it is intended that all of the subject matter of the above description or shown in the accompanying drawings shall be interpreted merely as examples illustrating the inventive concept herein and shall not be construed as limiting the invention.

DESCRIPTION OF SYMBOLS

[0025]

1	fireproof door
10	fireproof core material
11	looking window installing space
12	fireproof door board
2	looking window frame
20	female sheet
21	male sheet
200	coarctation forming surface
203	female button
204	top female sheet of looking window frame
205	bottom female sheet of looking window frame
213	male button
214	top male sheet of looking window frame
215	bottom male sheet of looking window frame
3	glass sheet
31	space block
4	fixed pin
5	U-type reinforcement sheet
51	serration arrangement
52	U-type reinforcement groove
53	front tip part
6	fireproof glue
7	sealed fixing glue

Claims

1. A structure for a looking window casement of a fireproof door, having a fireproof door, U-type reinforcement sheet with fixed pin, and a looking window frame clamped with glass sheet, the fireproof door having a cutting open place for looking window installing space, U-type reinforcement sheet with the fixed pin being fixed into the fireproof core material between a mezzanine of fireproof door at the proper place of the circumference, female sheet of looking window frame having female button to be placed on

the cutting open place for looking window installing space and male sheet of looking window frame having male button clasped each other.

2. The structure for a looking window casement of a fireproof door as claimed in Claim 1, wherein the glass sheet being able to double sheets. 5
3. The structure for a looking window casement of a fireproof door as claimed in Claim 1, wherein the front part of both sides in the U-type reinforcement sheet being cut and punched into serration arrangement with row pattern. 10
4. The structure for a looking window casement of a fireproof door as claimed in Claim 1, wherein both sides of the U-type reinforcement sheet being pressed with U-type reinforcement groove, the top parts of the both sides of U-type reinforcement sheet being cut into the shape of the front tip part. 15 20

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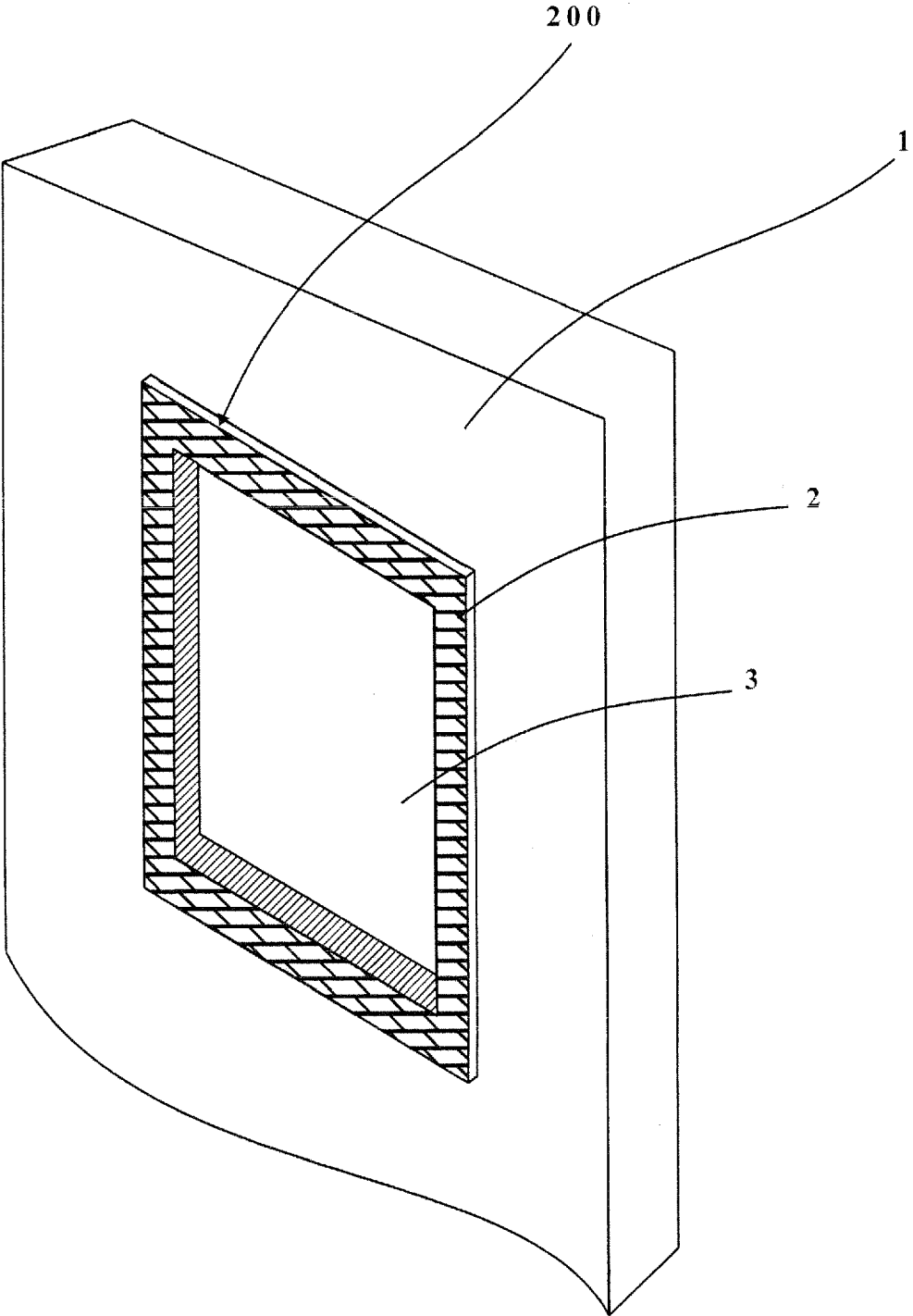


FIG.1

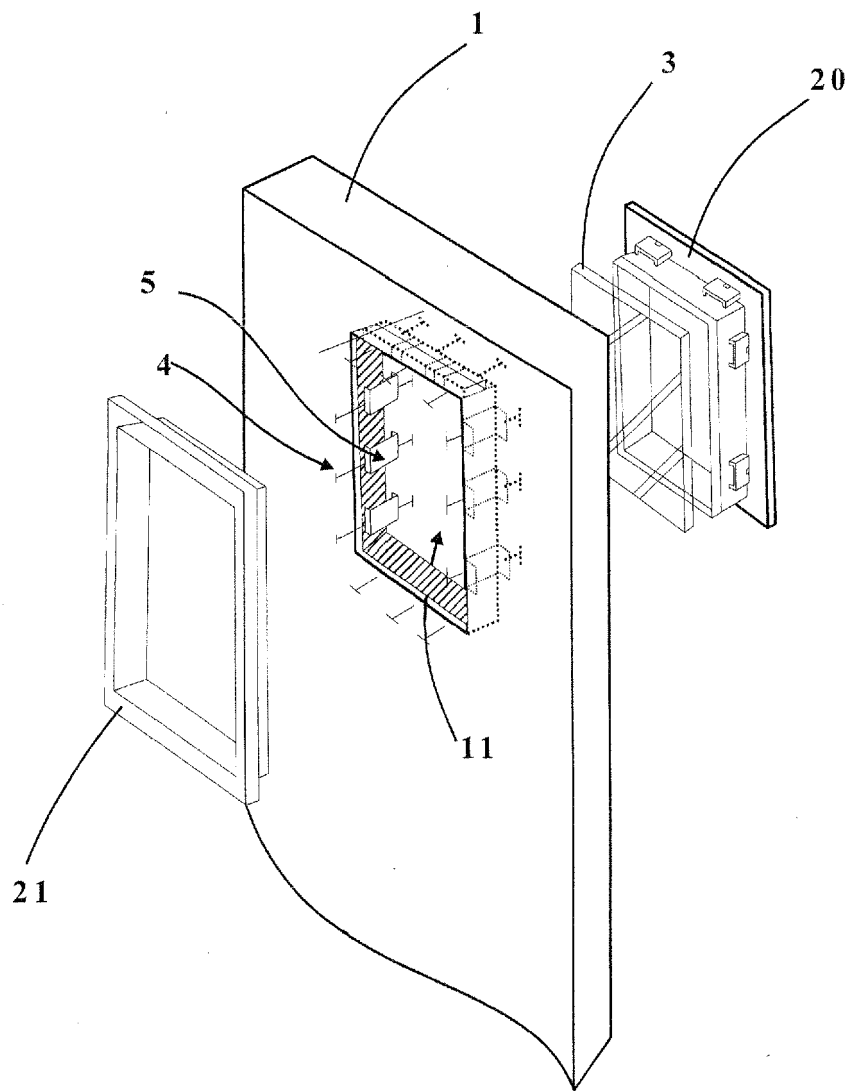


FIG.2

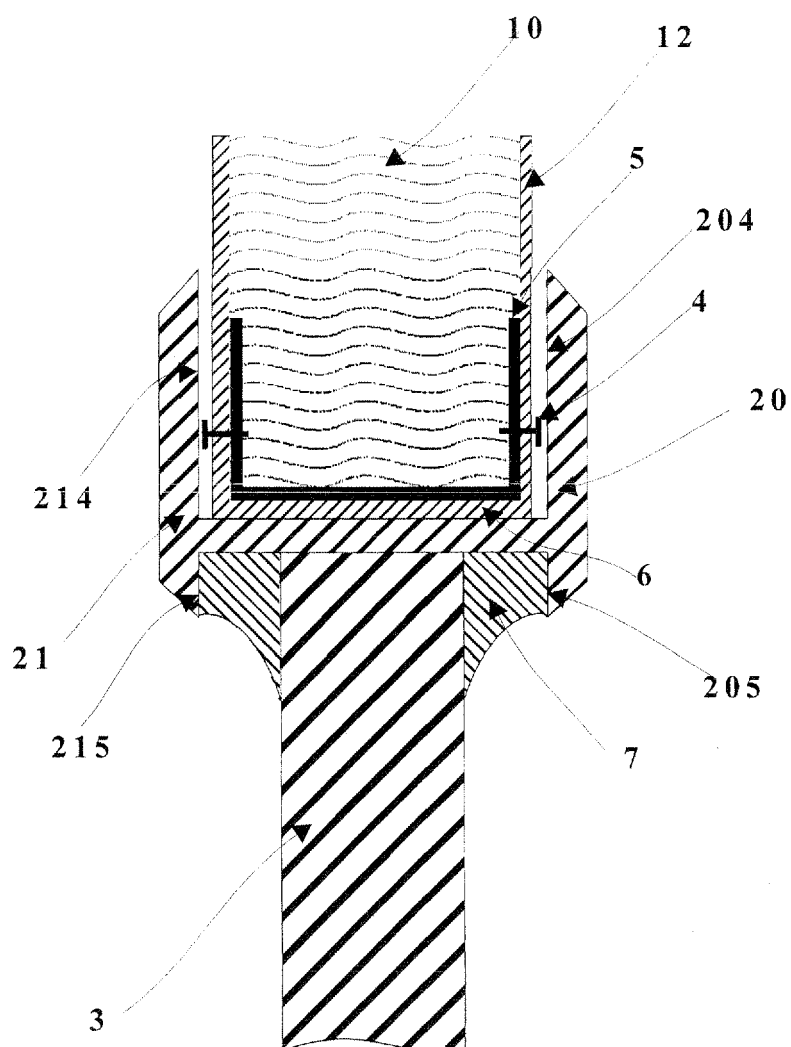


FIG.3

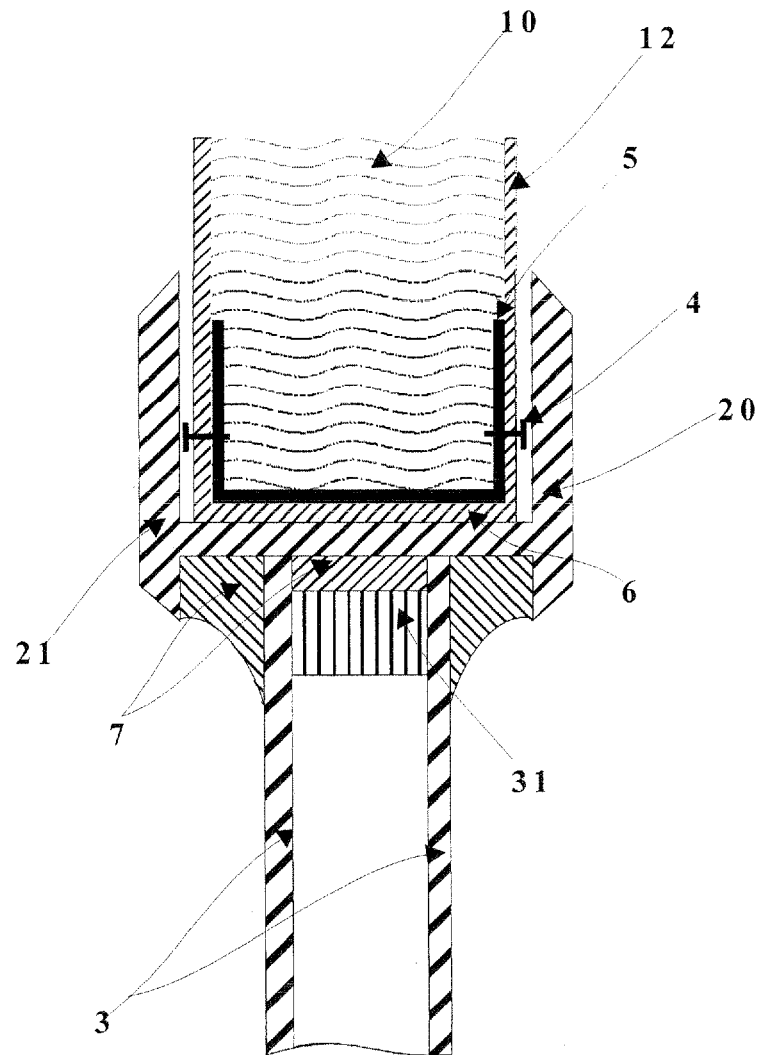


FIG.4

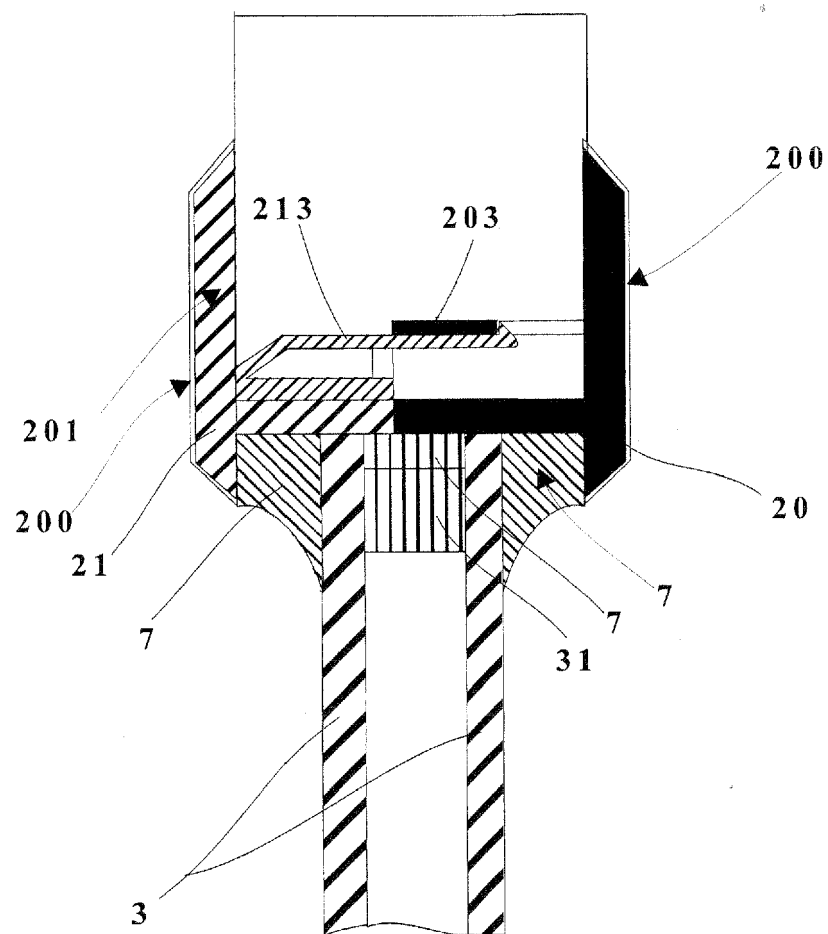


FIG.5

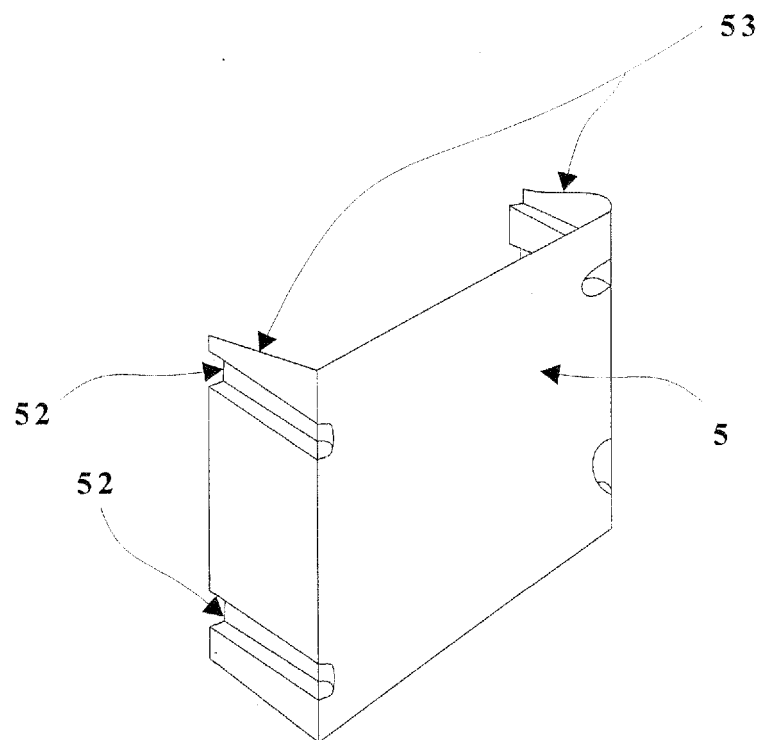


FIG. 6

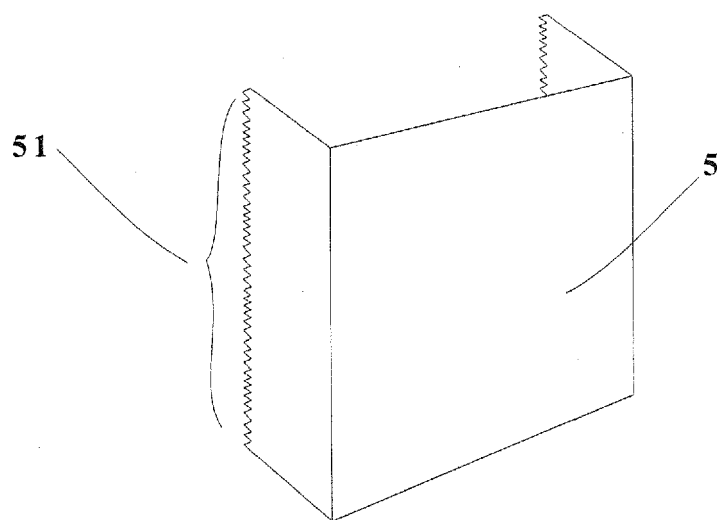


FIG. 6-1



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 2576

DOCUMENTS CONSIDERED TO BE RELEVANT			
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X	US 6 619 005 B1 (CHEN KUEI YUNG WANG [TW]) 16 September 2003 (2003-09-16) * figures 10,15 * * column 1, lines 65-68 * * column 2, lines 1-49 * * column 5, lines 28-44 * * column 6, lines 16-45 * -----	1-4	INV. E06B3/58
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A	EP 0 773 342 A1 (NANYA PLASTICS CORP [TW]) 14 May 1997 (1997-05-14) * figure 8 * * column 4, lines 6-10 * -----	3	
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 July 2007	Examiner Blancquaert, Katleen
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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