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Description

The present invention relates to a ventilation device for use at a doorway in a building.

Ventilation air flows between rooms and zones in buildings has been achieved by the provision of ventilation devices in doors and also in partition walls of the building. These devices have been installed by cutting a suitable aperture in the door (or in the partition wall) and fitting the device into the aperture. However this arrangement has the disadvantages that fitting of the device is awkward and can weaken the door structure, and further there is often a deleterious effect on aesthetic quality of the door or partition wall.

A ventilation system for use in a window type structure is described in DE-A-1934996, the system including a ventilation duct in a frame part of the window surround whereby ventilation air can pass directly through the frame part between an inlet and an outlet on opposite faces of the frame part, a laterally projecting portion from the frame part constituting a sealed abutment for a movable glazing unit. The air outlet includes an air flow control. EP-A-0115824 shows a generally similar ventilation system for glazed windows or doors. In this case however the outlet for the air from the system ventilation duct faces downwardly. Additionally in contrast to DE-A-1934996, the ventilation duct of this system forms a portion of the actual movable sash or glazing unit of the window as distinct from the window surround, the duct being secured to a frame part of the sash and including means to support a glazing assembly.

It is an object of the present invention to provide a ventilation device for fitting at a doorway so as to be relatively unobtrusive, but which is convenient to fit and which gives satisfactory ventilation performance.

According to the present invention there is provided a ventilation device as set out in the appended claim 1.

Preferably the elongate member is adapted to serve as a top edge member of a doorway.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings wherein;

Fig 1 shows a front view of a door in a domestic dwelling including a ventilator device in accordance with the present invention;

Fig 2 shows a cross-section side view of the ventilator device of Fig 1 to a larger scale and through the section C-C in Fig 1.

Fig. 3 shows a pictorial view of the ventilator of Fig 2

Fig. 4 shows a plan of a domestic dwelling provided with ventilation device in accordance with the present invention and also with ventila-

tion devices located at the windows;

Fig. 5 shows a cross-sectional elevational end view of a ventilation device in accordance with the present invention fitted at a door aperture and in accordance with a second embodiment;

Fig. 6 shows a sectional end view of a third embodiment;

Fig. 7 is an exploded pictorial view of the Fig. 5 embodiment, and

Fig. 8 is a sectional end view of a fourth embodiment.

Referring to Figs. 1 to 3, a vent 9A is fitted at the top of a door 35. The door aperture is provided, in conventional manner, with upright wooden standards 36 and a top transverse standard 37 bounding the wall blockwork 38 surrounding the door aperture. The blockwork 38 has plaster surface linings 39, and the normal door facings 40 and bottom skirtings 41 are present. Each of the standards 37, 38 includes step of jamb (stop) portions. The vent 9A comprises a box conduit structure 42 which can be made by an extrusion process. The structure 42 includes an air inlet 24, the outlet 22A being provided with an airflow control comprising a fixed apertured plate 22 and a slidable apertures plate 21 for "hit-and-miss" control with the plate 22. The vent conduit structure 42 is secured to the top standard 37, which can be rebated as shown to accept the conduit.

Alternatively, if the standard 37 is of rectangular cross-section, suitable packing can be provided at zone 37A. The vertical leg of the L-shaping conduit 42 presents a wall surface 43 serving as a door stop, and the conduit's vertical leg will have an appropriate length to meet the particular application eg. for fire door use.

An additional door stop strip 37B is secured to standard 37. The ends of the conduit structure 42 are closed by appropriate end caps 15.

For use with fire doors, the conduit structure 42 can include a channel to house a fire safety element 44 comprising for example an intumescent fire strip. The conduit structure 42 could house baffle means such as for example of cartridge form. Further, a clip-on cover or nose drip 45 can be located at the inlet 24, especially where the door 35 is an external door (opening outwardly in this case).

The above vent 9A provides a very simple efficient and effective means of secondary ventilation through buildings involving the passage of air over the head of the door rather than via vents fitted into apertures in the door, or through an opening in the partition or wall enclosure.

The conduit structure 42 can comprise a simple extruded box section (with various possible adaptations for fly screens, thermal or sound baffle cartridges as per the window vent type etc.) which

replaces the top door stop on the door standard or door set. Individual vents would be cut (to the full internal size of door set) from a long length of extruded section and, along with end caps etc., the full assembly would then be screwed up onto the top standard thus providing the door stop as well as the ventilator.

The conduit can either be fixed into a pre-rebating standard or planted straight onto the standard as illustrated. The door stops can either be "part only" to line through with width of projecting section of vent unit or packed out and taken full width of door standard without any complications.

The section could be formed in a number of different materials and could have a number of control systems.

The above vent device for doors has the following advantages:-

1. The system is very simple, unobtrusive and aesthetically pleasing thus providing a very acceptable means of secondary 'through' ventilation in buildings.
2. The system doubles up as a door stop - and this is required in any event.
3. The system allows for easy control of ventilation if required.
4. The system can be either installed "on site" or in the factory in pre-fabricated door standards or sets.
5. The system can be manufactured simply (only one main section type) in a number of materials depending upon specification of finish required. Individual vents would be cut from long lengths as required.
6. Sound or thermal baffle cartridges can be easily incorporated if required similar to window vent system as shown in UK Pat. Appln. Nos. 8712477 and 8715570.
7. Because of the form of the vent system it is possible to incorporate a means of "fire stop" (unlike most other systems) although fire stopped vents would require to be made in steel or other non-combustable material

Fig. 4 shows an environment system utilising various window vents (WV) in accordance with UK Patent application 8712477 and door vents (DV), the vents DV being as above described and in accordance with the present invention. The environment system provides an almost infinitely variable number of arrangements for secondary (trickle) ventilation for buildings.

The system provides the following range of options:

1. Door VENT system only (permanent and non controllable);
2. Door VENT system only (controllable - manual or automatic);

3. Window VENT system only (permanent and non controllable);

4. Window VENT system only (controllable - manual or automatic);

5. Full VENT (door and window) system (permanent and non-controllable);

6. Full VENT (door and window) system (controllable - manual or automatic).

A. Each of the above systems can be fitted with sound baffle cartridges or fly screens if required providing further permutations.

B. For controllable vents, automatic control can be provided by a number of methods:-

(1) On an individual room (or ventilator) basis by means of a humidity sensor and/or mechanism (electrical, mechanical or organic) located within each VENT unit. This system would provide a very efficient particular control only in rooms requiring ventilation.

(2) On a general basis by means of a centrally located humidity sensor and with links to each VENT control thus providing uniform conditions in each room.

(3) On very high specification installations a small computer could be incorporated to provide even more finely tuned control.

By means of only the two basic VENT systems (door and window openings) and the possibility of sound or thermal baffle 'cartridges' complete control of the environment is very easily maintained. The simplicity, efficiency and flexibility of the present Environment System provides for the possibility of highly tuned natural secondary ventilation from zero air changes up to many times the minimum Building Regulation standards.

Specifically Fig. 4 shows a typical five apartment house layout demonstrating many of the Environment Systems.

The essence of the above Environment Systems is one of considering the control and efficiency of secondary ventilation of buildings as a science in its own right rather than the traditional idea of ventilators being considered like accessories for windows and doors.

The control units for the various window and door vents WV, DV are shown schematically as item C (CO being such units in the open condition). The cross hatching shows home areas, specifically the lounge and hall, in a ventilated mode by means of the open control units CO.

The embodiment shown in Fig. 5 is applied in a door like the embodiment of Figs. 1 to 3 and like parts carry like reference numerals. However in this case the door head frame member is formed as a cellular form plastics extrusion 56. Integral with the extrusion 56 is a door vent 57 generally similar to the vent 9A of Fig. 1. As previously, a sound proof baffle could be installed in the vents 52 or 57.

As an alternative to the plastics extrusion construction it would be possible to have the vent structure formed integral with a metal form frame member at an aperture. For example this metal form frame member could take the form of an aluminium extrusion.

Figs. 6 and 7 show a vent 9A in accordance with another embodiment of the present invention fitted at the top of doorway 35 - exactly of the construction shown in Fig. 1, and the vent 9A is basically similar to the vents 9A of the previous embodiments.

The conduit 42 is secured by screws 16 to the top standard 37, which can be rebated as shown to accept the conduit.

Alternatively, if the standard 27 is of rectangular cross-section, suitable packing can be provided at zone 37A. Again the vertical leg of the L-shaped conduit 42 presents a wall surface 43 service as a door stop, and the conduit's vertical leg will have an appropriate length to meet the particular application eg. for fire door use. An additional door stop strip 37B is secured to standard 37. A horizontal air discharge 22A is present as in the previous embodiment, and again a control strip 21 is provided for air flow control. The ends of the conduit 42 can be closed by appropriate end caps 15 as previously and generally like parts carry like reference numerals.

The sides 24A, 22A of the conduit structure 42 at the air inlet and the air outlet respectively carry a series of apertures 50, 51 on internal longitudinal walls for lateral airflow through the conduit 42. Each end cap 15 (see Fig. 7) comprises a recessed base part 60 carrying a set of lugs or tongues 61 and 63A with interior corners of the conduit structure 42. Further, the base part 60 presents a laterally directed tab plate 64 on which an end of the air flow control plate 21 is slidable, the tab plate 64 serving to close off a respective end portion of the air flow control 21/22 so that effective air flow control is always possible from zero to maximum rates.

Cord controls can be fitted or control can be by means of recessed mechanism within vertical door frames of vertical door stops.

Thus as shown in Fig. 2, an operating cord 68 is connected to a laterally extending finger grip 23 of the plate 21, and extends to the sides of the vent 9A where it passes through a hole 67 in a downstand bracket 66 on the tab plate 64 and then downwardly to the operating position, so enabling convenient remote control of the vent 9A located at the top door standard.

To facilitate matching requirements and interchangeable nose part 42A is provided insertable into a recess in the main conduit 42 and can have various shapes, sizes, colours etc. A strip 16B is

fitted into a recess of the conduit 42 to cover the screwheads of screws fitted through apertures 16A.

The conduit 42 can comprise a simple extruded box section (with various possible adaptations for fly screens, thermal or sound baffle cartridges as per the window vent type etc.) which replaces the top door stops on the door standard or door set. Individual vents would be cut (to the full internal size of door set) from a long length of extruded section and, along with end caps etc. the full assembly would then be screwed up onto the top standard thus providing the door stop as well as the ventilator.

The conduit can either be fixed into a pre-batted standard or planted straight onto the standard as illustrated. The door stops can either be "part only" to line through with width or projecting section of vent unit or packed out and taken full width of door standard without any complications.

In the embodiment of Fig. 8 a vent 9A is again provided for the top of a doorway but in comparison with the vent of Figs. 12-14, the vent of Fig. 15 is designed to include structure replacing the top transverse door standard 37, and for this requirement the conduit 42 includes a back portion 42B. In this example the conduit 42 is screwed directly into the top blockwork 38, and the conduit portion 42B can include an access plate 16B for access to fixing screws 16.

Claims

1. A ventilation device for use at a door, comprising an elongate member (42) adapted to serve as part of a side frame structure (37) of a doorway, said elongate member (42) comprising a box structure which is L-shaped in transverse cross-section, the box-structure (42) being adapted such that the shorter leg projects laterally so as to overhang a door (35) and serve as a stop for the door (35), an air conduit being defined between spaced walls of the box structure (42) for through passage of ventilating air, said elongate structure (42) including an inlet port (24) to said conduit and a discharge port (22A) from the conduit, an air-flow control device (21, 22) in one of the ports for controlling air flow through the port, and end caps (15) closing the ends of the box structure (42) characterised in that one of said ports (22A) is located in the shorter leg of the box structure (42) such that said one port (22A) faces downwardly, and in that a lateral reinforcing structure (22) joins the spaced wall portions of the box structure (42) in said shorter leg, said reinforcing structure (22) defining openings for passage of air via said one port (22A) in the shorter leg, and in that the end

caps (15) include plate portions (64) which extend laterally from the caps to overlie said air-flow control device (21, 22).

2. A ventilation device as claimed in claim 1, characterised in that the reinforcing structure (22) comprises an apertured wall. 5
3. A ventilation device as claimed in claim 1 or 2 characterised in that said one port (22A) comprises the discharge port. 10
4. A ventilation device as claimed in any one of the preceding claims characterised in that the elongate member (42) is adapted to serve as a top edge member of a doorway. 15
5. A ventilation device as claimed in claim 4, characterised in that the elongate member (42) is adapted to be secured to a top door transverse standard member (37) of a doorframe. 20
6. A ventilation device as claimed in claim 4, characterised in that the elongate member (42 Fig 5) comprises a top door transverse standard member of a doorframe. 25
7. A ventilation device as claimed in claim 1, characterised in that the elongate member (42) is in the form of a vent assembly including a main duct body (42), and a nose portion (42A), said nose portion (42A) being in the form of a separate interchangeable unit, joining means being provided for removably connecting said nose portion (42A) to the main duct body (42). 30 35
8. A ventilation device as claimed in any one of the preceding claims, characterised in that an air flow control (21/22) is provided at the air discharge port (22A). 40
9. A ventilation device as claimed in claim 8, characterised in that the airflow control comprises a first plate (22) of aperture form and a relatively moveable second plate (21) controlling airflow through the first plate (22). 45
10. A ventilation device as claimed in claim 9, characterized in that actuating means (68) are fitted to a control element (23) for remote operation of the second plate (21). 50
11. A ventilation device as claimed in claim 10, characterised in that the end caps (15) include support means (66, 67) to support said actuating means (68) which for example can be in the form of a cord. 55

12. A ventilation device as claimed in any one of the preceding claims, characterized in that the elongate member (42) is made of plastics material and is formed by an extrusion process.

Patentansprüche

1. Lüftungseinrichtung an einer Tür mit einem als Teil einer Türzarge (37) dienenden langgestreckten Teil (42) von kastenförmigem Aufbau, welches im Querschnitt L-förmig ist und dessen kürzerer Schenkel seitlich so vorsteht, dass er bezogen auf die Tür (35) einen Überhang bildet und als Anschlag für die Tür (35) dient, wobei Wände des kastenförmigen Teils (42) mit Abstand voneinander einen Luftkanal begrenzen, durch den bei der Lüftung die Luft hindurchströmt; das langgestreckte Teil (42) hat eine in den Kanal mündende Einlaßöffnung (24) und eine aus dem Kanal herausführende Auslaßöffnung (22A), in der Einlaßöffnung oder in der Auslaßöffnung eine Steuereinrichtung (21, 22) zum Steuern der durch die betreffende Öffnung hindurchströmenden Luftmenge, und Abschlußkappen (15), welche die Enden des kastenförmigen Teils (42) verschließen, **dadurch gekennzeichnet**, dass eine der beiden Öffnungen (22A) im kürzeren Schenkel des kastenförmigen Teils (42) angeordnet ist, so dass diese eine Öffnung (22A) nach unten weist, und dass ein sich seitlich erstreckendes, verstärkendes Gebilde (22) die beiden in dem kürzeren Schenkel liegenden Wandteile des kastenförmigen Teils (42), welche einen Abstand voneinander haben, miteinander verbindet und Öffnungen zum Durchtritt von Luft durch diese eine Öffnung (22A) in dem kürzeren Schenkel begrenzt, und dass die Endkappen (15) plattenförmige Teile (64) aufweisen, welche sich von den Kappen aus zur Seite erstrecken, so dass sie die Steuereinrichtung (21, 22) für den Luftstrom überlagern.
2. Lüftungseinrichtung nach Anspruch 1, **dadurch gekennzeichnet**, dass das verstärkende Gebilde (22) eine mit Öffnungen versehene Wand hat.
3. Lüftungseinrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet**, dass jene eine Öffnung (22A) die Auslaßöffnung ist.
4. Lüftungseinrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass das langgestreckte Teil (42) das obere Begrenzungsstück des Durchgangs bildet, in welchem sich die Tür befindet.

5. Lüftungseinrichtung nach Anspruch 4, **dadurch gekennzeichnet**, dass das langgestreckte Teil (42) zur Befestigung beim oberen, quer verlaufenden Schenkel (37) einer Türzarge bestimmt und ausgebildet ist. 5
6. Lüftungseinrichtung nach Anspruch 4, **dadurch gekennzeichnet**, dass das langgestreckte Teil (42, Figur 5) den oberen, quer verlaufenden Schenkel einer Türzarge bildet. 10
7. Lüftungseinrichtung nach Anspruch 1, **dadurch gekennzeichnet**, dass das langgestreckte Teil (42), durch welches hindurch die Lüftung erfolgt, aus einem Hauptteil (42) und einem Vorderteil (42A) besteht, welches als Einzelteil austauschbar ist, und dass Verbindungsmittel vorgesehen sind, mit denen das Vorderteil (42A) lösbar mit dem einen Kanal bildenden Hauptteil (42) verbunden ist. 15
20
8. Lüftungseinrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass zur Steuerung der Luftmenge an der Luftaustrittsöffnung (22A) eine Steuereinrichtung (21/22) vorgesehen ist. 25
9. Lüftungseinrichtung nach Anspruch 8, **dadurch gekennzeichnet**, dass die Steuereinrichtung für die Luftströmung eine erste Lochplatte (22) und eine relativ zu ihr bewegliche zweite Platte (21) enthält, welche den Luftstrom durch die erste Platte (22) steuert. 30
10. Lüftungseinrichtung nach Anspruch 9, **dadurch gekennzeichnet**, dass zur Fernbedienung der zweiten Platte (21) Betätigungsmittel (68) mit einem Steuerteil (23) verbunden sind. 35
11. Lüftungseinrichtung nach Anspruch 10, **dadurch gekennzeichnet**, dass die Abschlußkappen (15) eine Trageinrichtung (66, 67) haben, um die Betätigungsmittel (68) zu tragen, bei denen es sich z.B. um eine Schnur handeln kann. 40
45
12. Lüftungseinrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass das langgestreckte Teil (42) ein stranggepreßtes Kunststoffteil ist. 50

Revendications

1. Dispositif de ventilation à monter sur une porte, comprenant un élément allongé (42) conçu pour servir de partie d'une structure latérale de cadre (37) d'une huisserie de porte, ledit élément allongé (42) comportant une structure en 55

caisson qui a, en coupe transversale, la forme d'un L, la structure en caisson (42) étant agencée de manière que le bras le plus court fasse saillie latéralement afin de surplomber une porte (35) et serve de butée à la porte (35), un conduit d'air étant délimité entre des parois espacées de la structure en caisson (42) pour permettre le passage de l'air de ventilation, ladite structure allongée (42) comportant une ouverture d'entrée (24) dans ledit conduit et une ouverture de sortie (22A) du conduit, un dispositif (21, 22) de commande de débit d'air dans l'une des ouvertures pour commander le débit d'air passant par l'ouverture, et des capsules d'extrémité (15) fermant l'extrémité de la structure en caisson (42) caractérisé en ce que l'une desdites ouvertures (22A) est placée dans le bras le plus court de la structure en caisson (42) de manière que ladite première ouverture (22A) soit orientée vers le bas, et en ce qu'une structure latérale de renfort (22) rejoint les parties de paroi espacées de la structure en caisson (242) dudit bras le plus court, ladite structure de renfort (22) délimitant des ouvertures de passage de l'air par ladite première ouverture (22A) du bras le plus court, et en ce que les capsules d'extrémité (15) comprennent des parties planes (64) qui s'étendent dans la direction latérale à partir des capsules pour recouvrir ledit dispositif (21, 22) de commande de débit d'air.

2. Dispositif de ventilation selon la revendication 1, caractérisé en ce que la structure de renfort (22) constitue une paroi ajourée.
3. Dispositif de ventilation selon la revendication 1 ou 2, caractérisé en ce que ladite première ouverture (22A) constitue l'ouverture de sortie.
4. Dispositif de ventilation selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément allongé (42) est conçu pour servir d'élément d'arête supérieure d'une huisserie de porte.
5. Dispositif de ventilation selon la revendication 4, caractérisé en ce que l'élément allongé (42) est prévu pour être fixé à une traverse supérieure (37) de porte standard d'une huisserie de porte.
6. Dispositif de ventilation selon la revendication 4, caractérisé en ce que l'élément allongé (42, figure 5) constitue une traverse supérieure standard d'huisserie de porte.

7. Dispositif de ventilation selon la revendication 1, caractérisé en ce que l'élément allongé (42) prend la forme d'un ensemble d'aération comprenant un corps principal de conduit (42), et une partie d'ajutage (42A), ladite partie d'ajutage (42A) étant sous la forme d'unité interchangeable distincte, des moyens d'assemblage étant prévus pour relier de façon amovible ladite partie d'ajutage (42A) au corps principal du conduit (42). 5
10
8. Dispositif de ventilation selon l'une quelconque des revendications précédentes, caractérisé en ce qu'une commande de débit d'air (21/22) est installée dans l'ouverture de sortie d'air (22A). 15
9. Dispositif de ventilation selon la revendication 8, caractérisé en ce que la commande de débit d'air comprend une première plaque (22) ayant une forme d'ouverture et une seconde plaque (21) relativement mobile commandant le débit d'air qui traverse la première plaque (22). 20
10. Dispositif de ventilation selon la revendication 9, caractérisé en ce que des moyens de manœuvre (68) sont installés sur un élément de commande (23) pour commander à distance la seconde plaque (21). 25
30
11. Dispositif de ventilation selon la revendication 10, caractérisé en ce que les capsules d'extrémité (15) comprennent des moyens de support (66, 67) pour supporter ledit moyen de manœuvre (68) qui peut, par exemple, être en forme d'un cordon. 35
12. Dispositif de ventilation selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément allongé (42) est fabriqué en matière plastique et par un procédé d'extrusion. 40
45
50
55

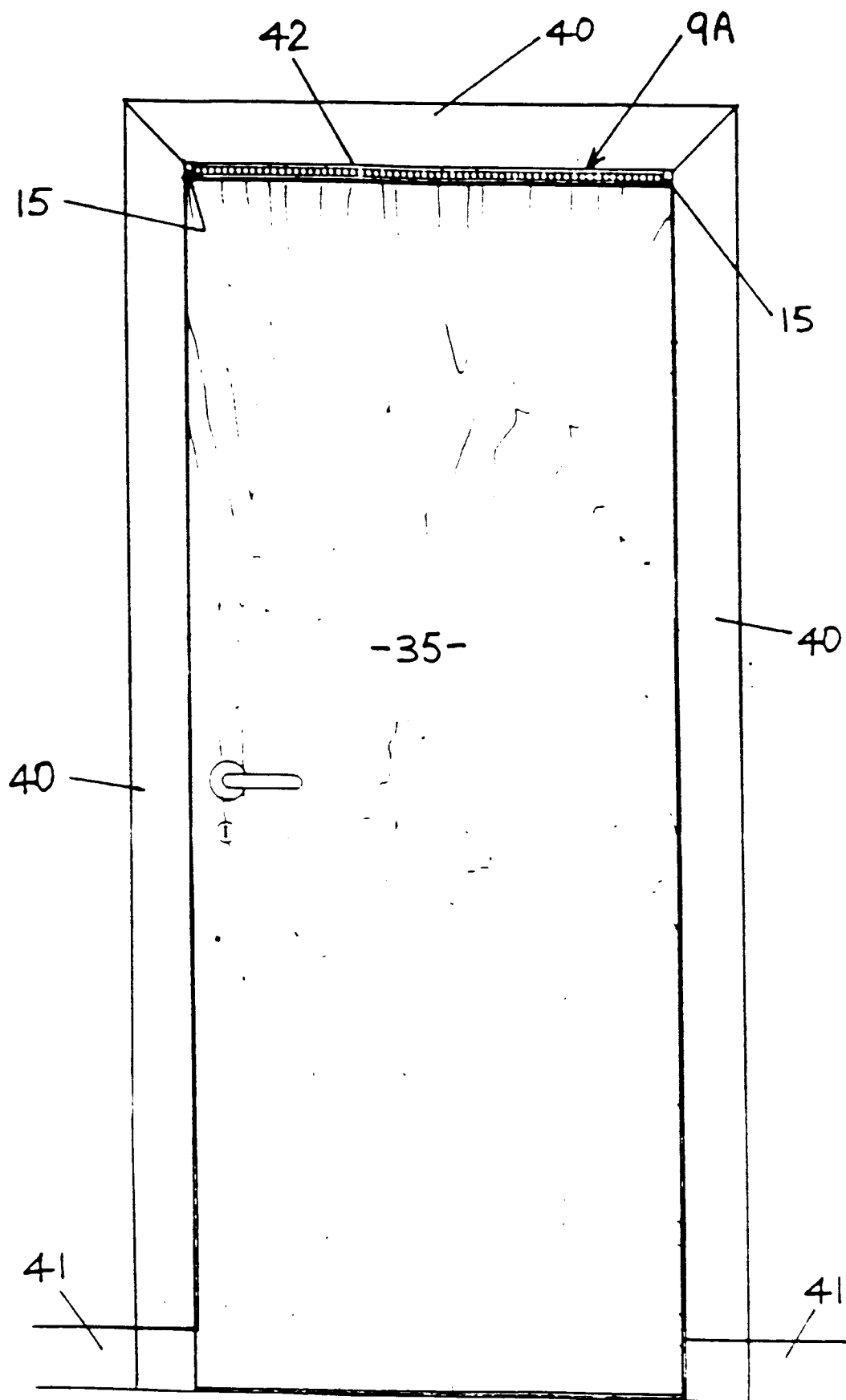
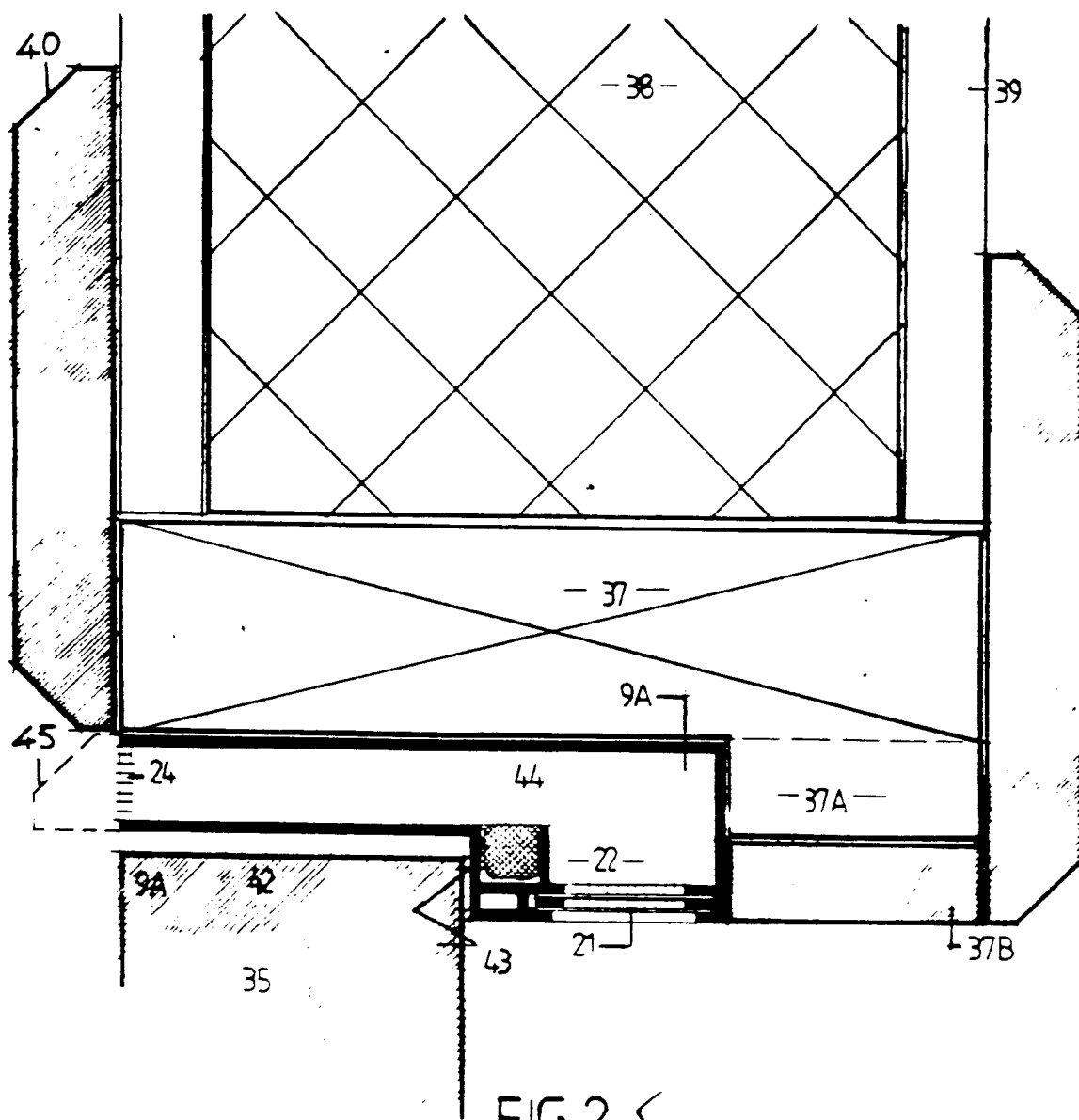
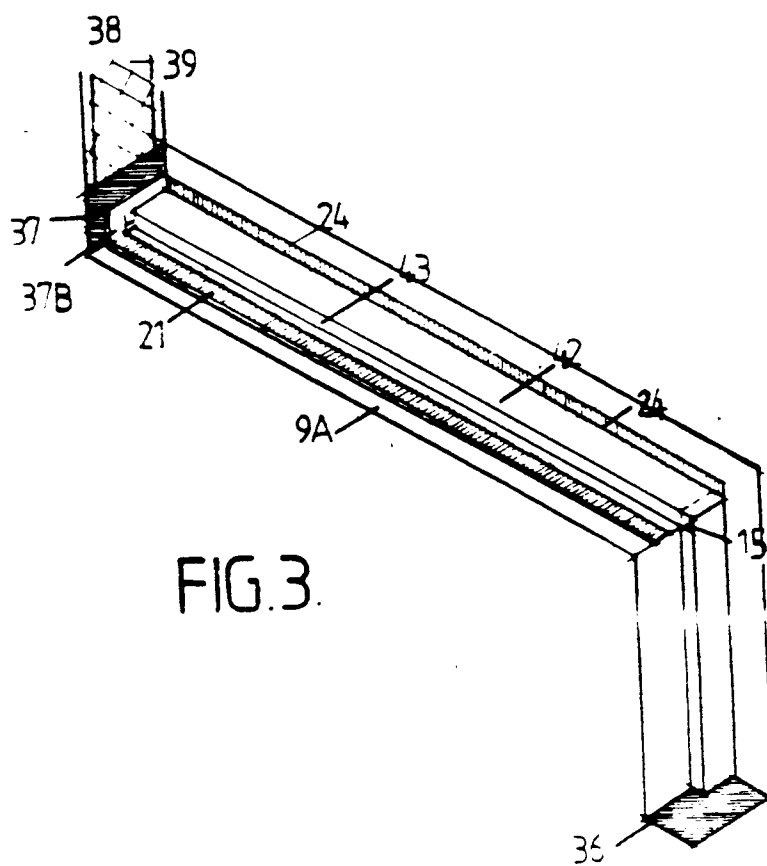


Fig. 1





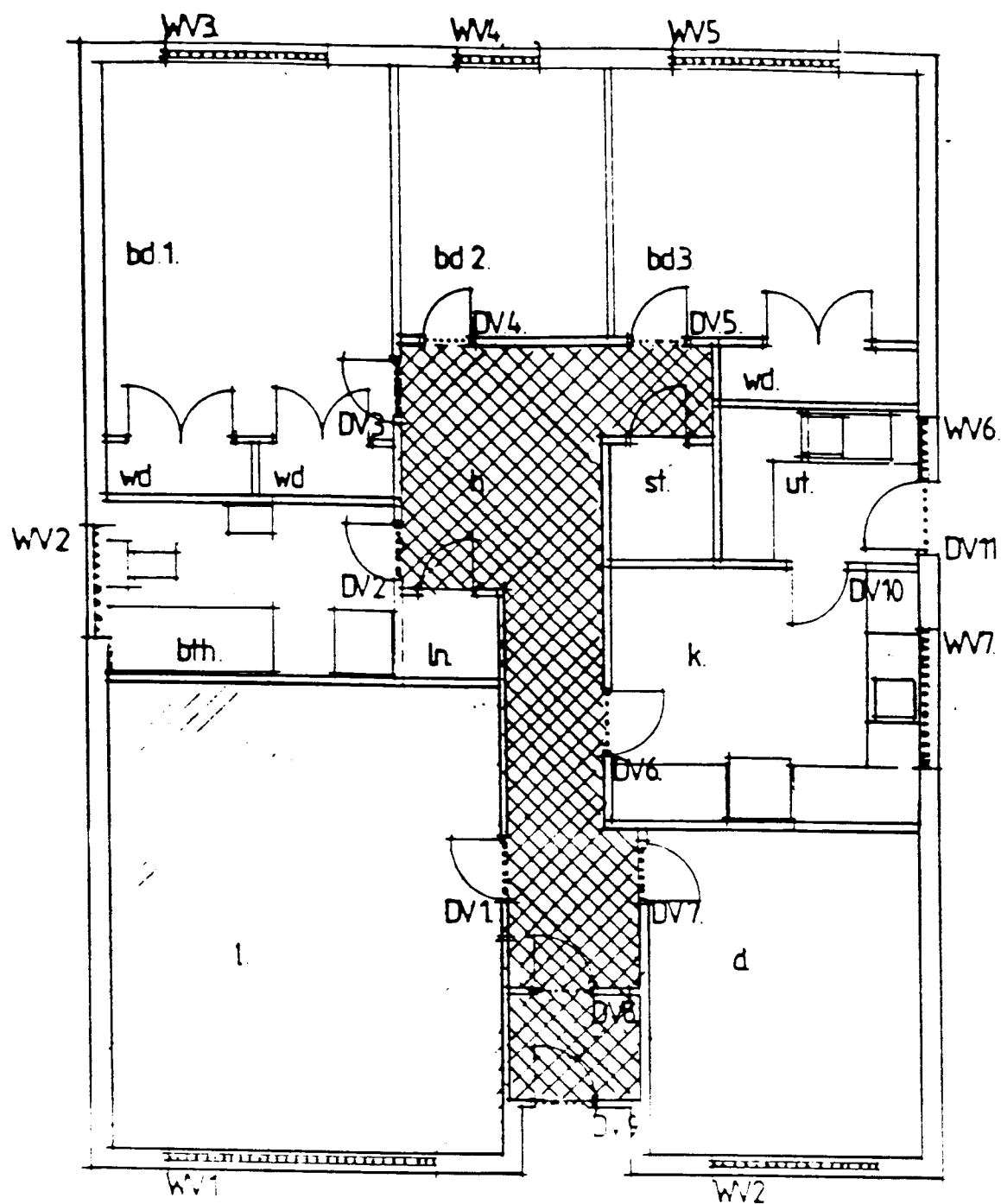


FIG.4

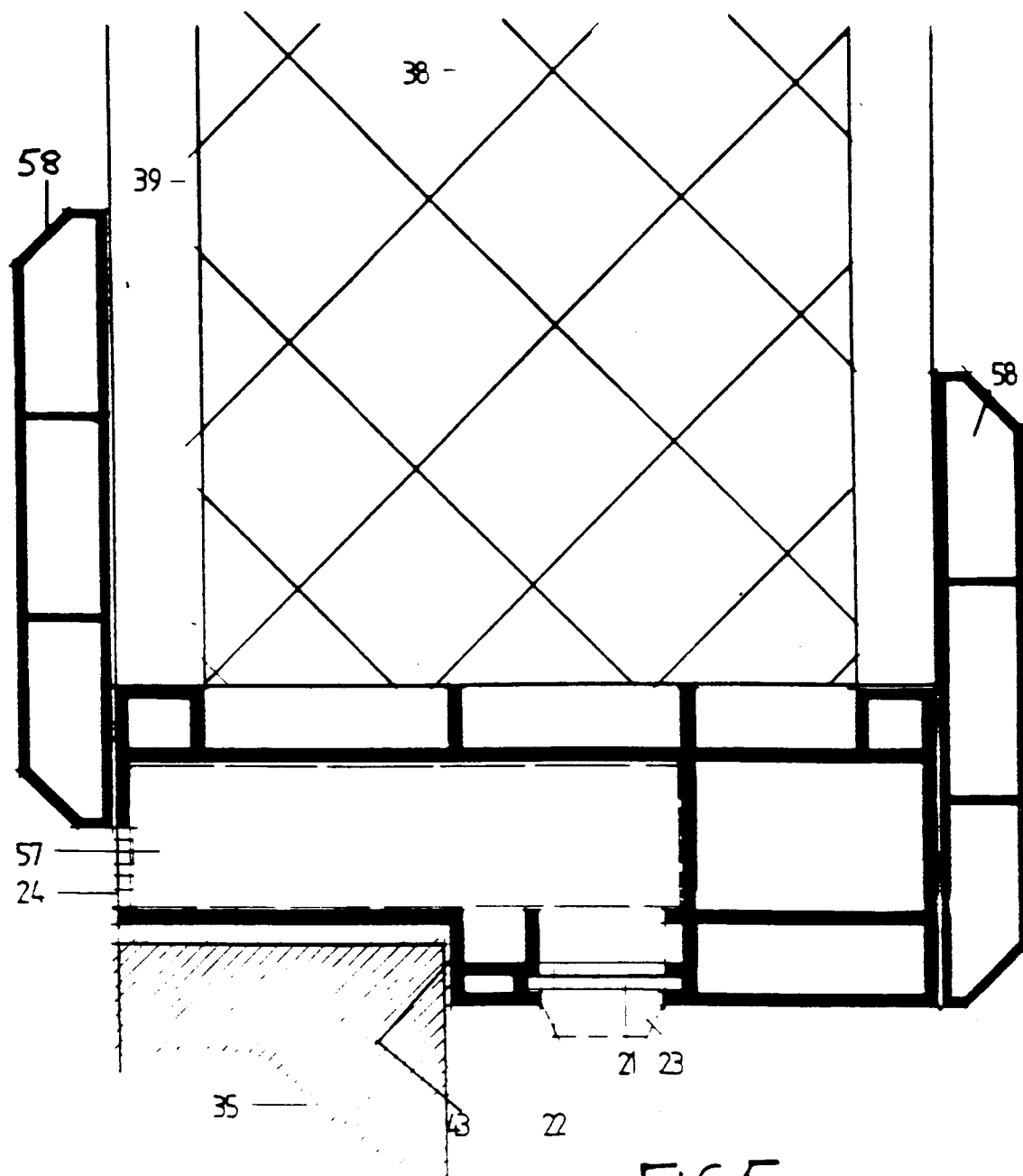


FIG. 5

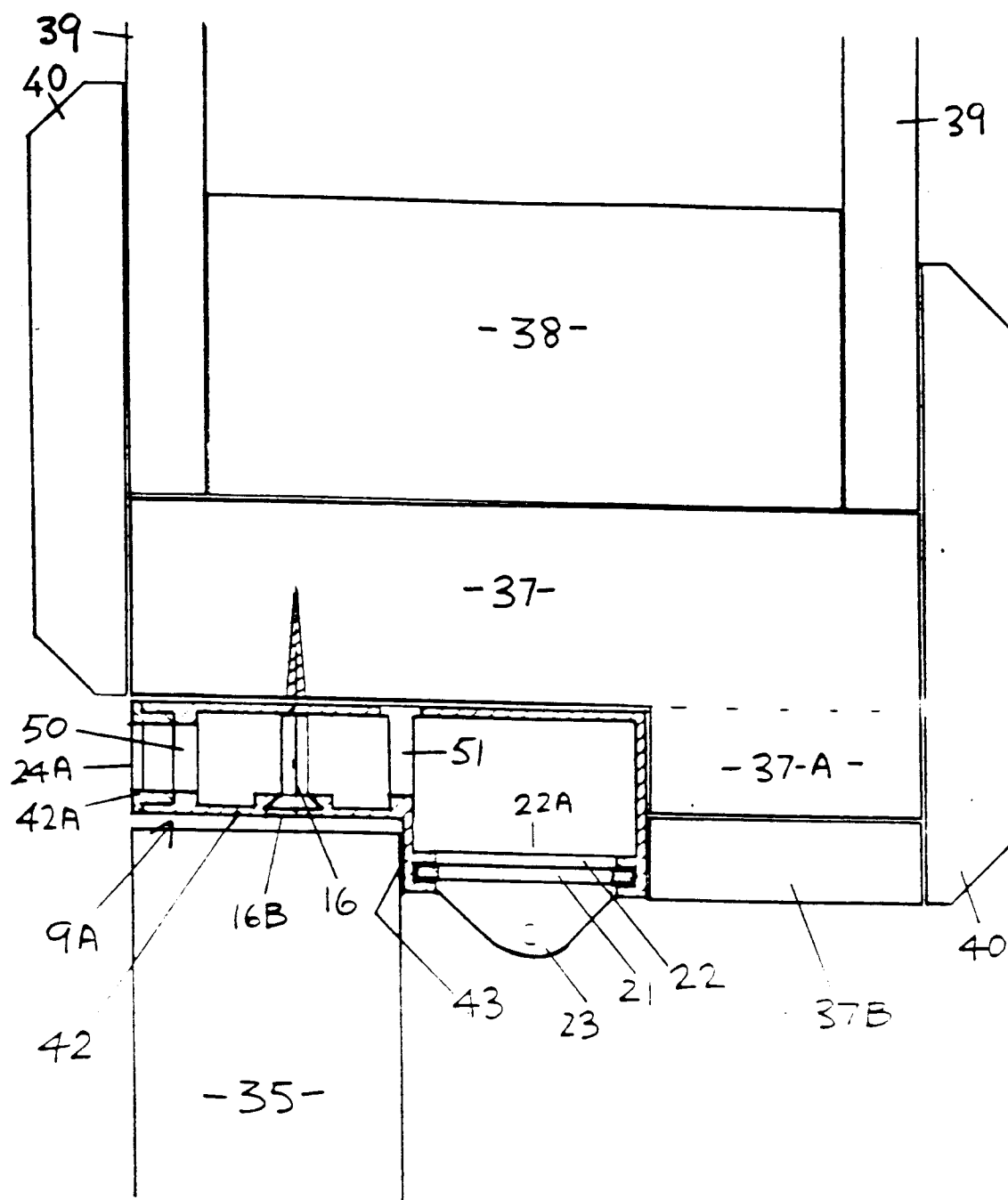
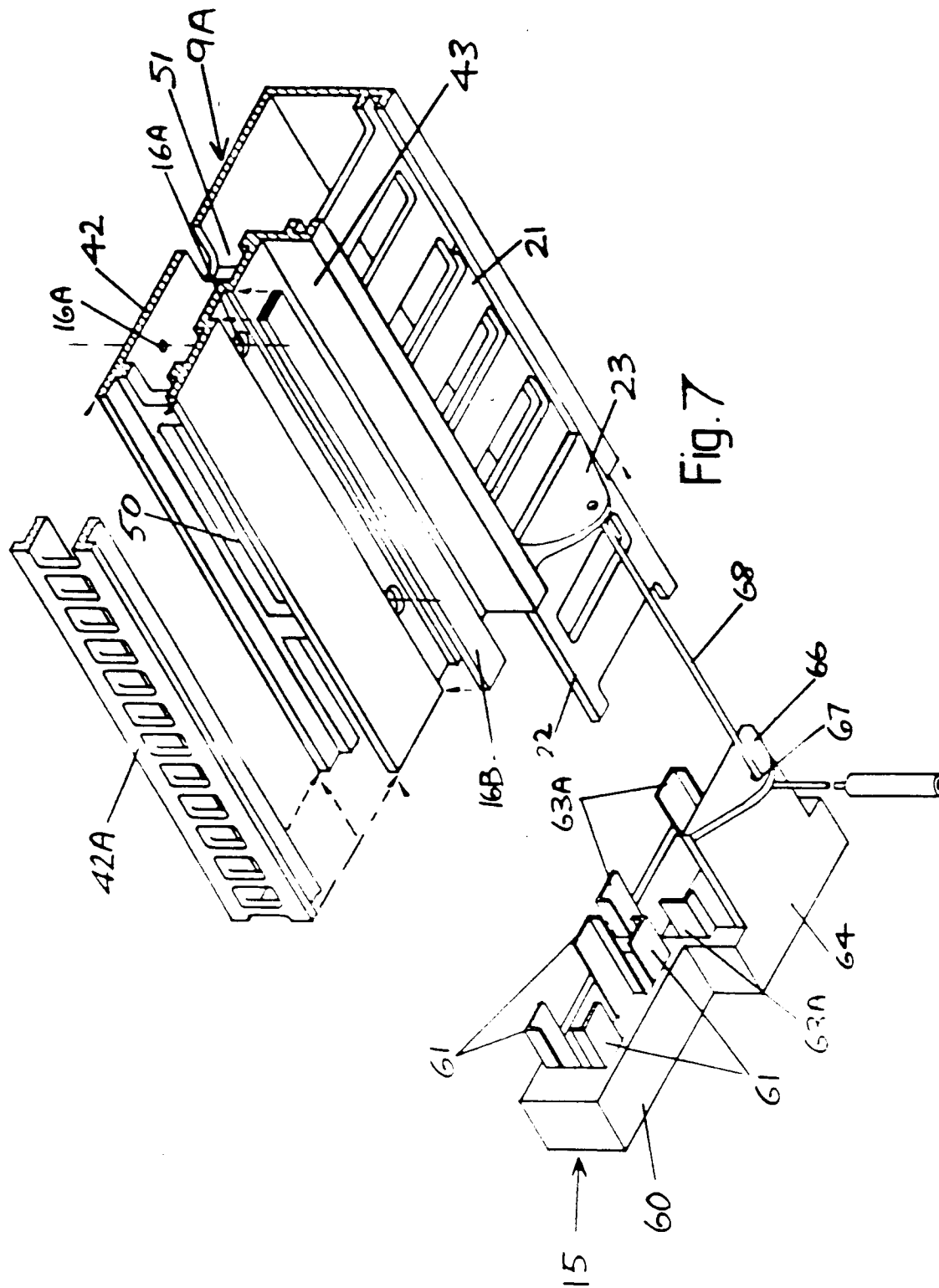


Fig.6



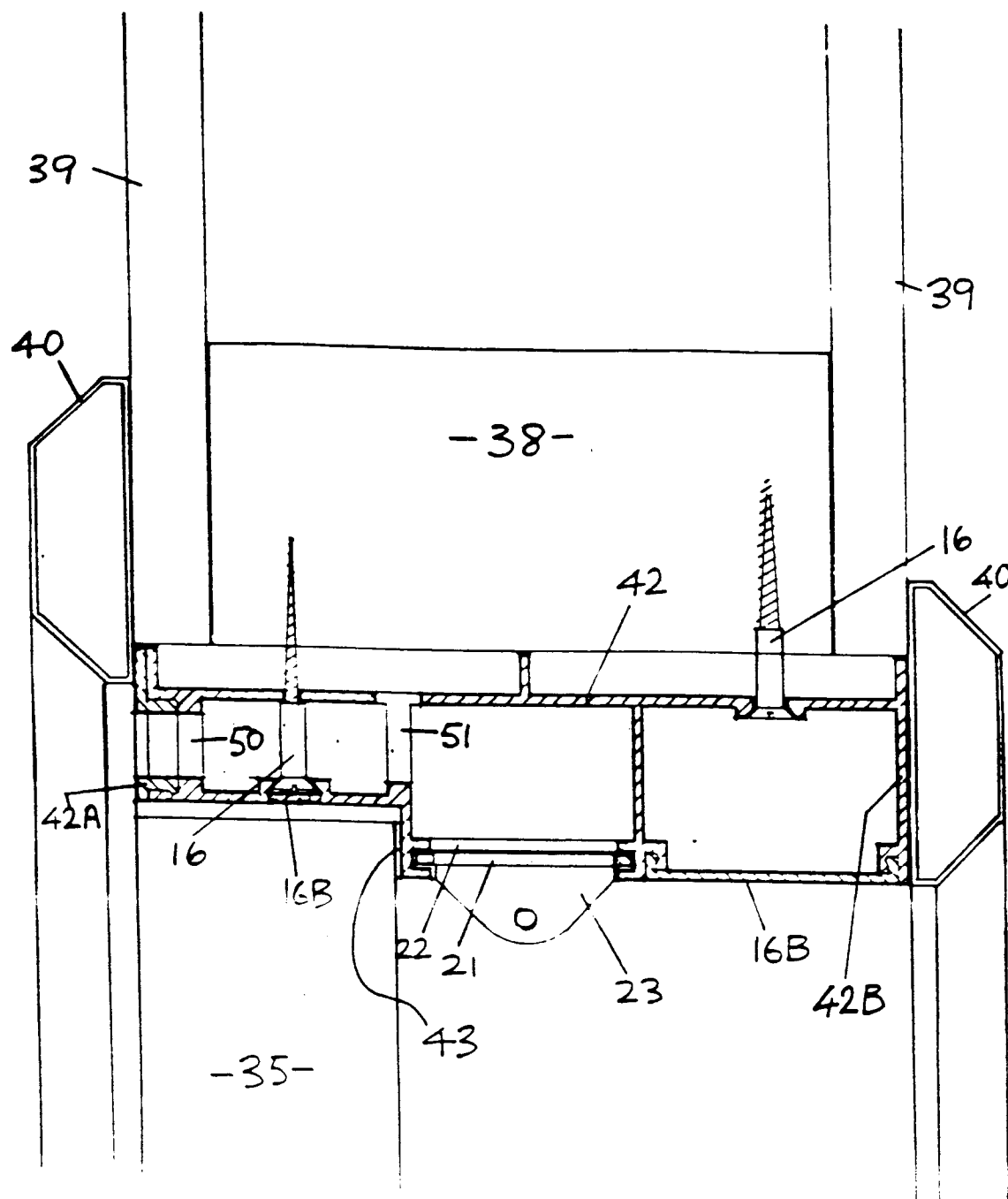


Fig. 8