

METHOD OF CONCEALING A DOOR FRAME ON A DOOR OR A SERIES OF DOORS

5 This invention relates to openings of a constructed building, more particularly relates to door frame of a constructed building. The invention most particularly relates to a concealed door frame and a method of concealing the door frame.

BACKGROUND TO THE INVENTION

10 Doors are usually installed into walls in a door frame. A door frame with optional rebates is affixed to the wall to give an accurate placement for the door prior to installation. After the doorframe is in place, door fittings such as hinges, door closers, lock strike plates are screwed, welded or fixed to the frame.

15 The conventional door frame is designed exclusively for walls. It is usually made of timber, metal or plastic as opposed to walls, which are usually made of bricks and mortars.

20 Popular timber made door frames have a minimum of twenty five millimetres of thickness around the door panel. This amount of thickness is necessary to accommodate bending in the middle of the frame to give the structure more rigidity. Other than that, the timber allows screws to penetrate the frame while securing door fittings.

25 Conventional door frames are clearly visible to the human naked eye. The visible part of the frame when the door is closed is known as an architrave. Door fittings such as door hinges, lever handles, knobs and door closers are also clearly visible.

30 Architects have tried to blend the doors with its frame and fittings to the wall aesthetically. It is desirable to create a door with concealed frame, which appears simple, neat and clean.

Presently, construction contractors find it impractical to blend the doors with the walls. The doorframe needs rebates and doorstops, which will not be accurate if produced as part of the wall. Furthermore, there is no effective method to secure door fittings onto walls. Even if the doorframe is concealed it will be senseless to have hinges, lever handles, knobs and door closers sticking out.

The most visible part of a door frame is the architrave – the part which surrounds the door panel when the door panel is closed.

Traditionally, frames are made of steel or timber with architraves, these give a definitely different visual finish as compared to walls.

As such, it is preferable to paint or finish the frame to suit the door instead of the wall – which it actually fixed to.

Furthermore, being of dis-similar materials, the frames tend to have crack lines when the plaster shrinks, or timber frame moves.

The present invention intends to overcome the above said disadvantage with a concealed door frame with novel hinges and lock.

SUMMARY OF THE INVENTION

This invention incorporates a thin door frame of approximately 1.5 – 5.0 mm thickness of architrave all around the door. Due to its thickness, compared to a conventional door frame, when the door frame is installed, it appears to be part of a wall. In other words, the invention utilizes a normal door frame with reduced thickness at the exposed side, so as to appear frameless.

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The door frame is made of timber, metal or plastic, or any material that does not shrink, twist or warp. The preferable material is metal, which may be bent or extruded with profiles to suit the door and wall.

The invention is not only for producing metal/plastic frames by bending or extrusion, in the profiles shown where the architrave is reduced from 20-50mm to 1.5 – 5mm to appear concealed, but can apply to traditional timber/composite frames by means of adding plaster stops to the frame architraves. The overall frame profile will have to match the same thickness of wall and as such, the

timber/composite frame will have to have reduced width (not thickness) for the plaster to cover over the embedded frame and stop cleanly at the plaster stop.

This add on plaster stop can be secured to the timber / composite frame directly on the architrave or into the main frame and can be of metal or plastic (Fig. 5).

- 5 The door frame may be adapted to suit a flush door to have a desired concealed frame from guest view. The second embodiment of the invention has a rebated door to have a desired concealed frame for both the guest view and home view.

For a series of outward opening doors, mullions, a form of special divider, is used in place of a door frame. Mullions may be used to separate one compartment
10 from the other and act as a base to install hinges and locks to secure the door.

When designing concealed mullions, the act of hinging, locking, and separating must also be considered so that the series of doors may be used without limitation. There are two kinds of concealed mullion presented in this invention.

To match a much thinner frame, a special offset pivot, which is used to swing the
15 door, is located within the door to make it concealed. Concealed hinges are adapted to the concealed frame to give a neat and clean appearance.

Surface mounted lock is used as part of the invention for doors viewed from one side only. This lock is covered by a lid which is hinged and covers the key hole by gravity to give the lock a neat and clean appearance from guest view. The lock is
20 mounted from home view.

It is an object of the invention to offer a simple, neat, clean and uncluttered door frame. The combination of door frame, plaster stops, mullions, pivot hinge and surface mounted lock offers a concealed door frame for a door or a series of doors..

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DESCRIPTION OF PREFERRED EMBODIMENTS

The invention will now be described in greater detail, by way of example, with reference to the accompanying drawings, in which;

Fig. 1 is a guest view of a front elevation of a single door frame according to prior art;

5 Fig. 2 is a guest view of a front elevation of a single door frame according to the present invention;

Fig. 3 is a sectional view, across 2-2 of Fig. 2, of the single door frame;

10 Fig. 4 is a partial view 4 of Fig. 3 of the single door frame using metal;

Fig. 5 is a partial view of a single door frame using timber with metal /plastic plaster stops;

15 Fig. 6 is partial view 4 of Fig. 4 of the single door frame using cement with plaster stop;

Fig. 7 is a sectional view, across 2-2 of Fig. 2, of the single door frame with a rebated door;

20 Fig. 8 is a guest view of a front elevation of a series of door according to prior art;

Fig. 9 is a guest view of an exploded front elevation of a series of doors according to the present invention;

25 Fig. 10 is sectional view, across 6-6 of Fig. 8, of the series of doors with an embodiment of mullions;

30 Fig. 11 is sectional view, across 6-6 of Fig. 8, of the series of doors with a second embodiment of mullions;

Fig. 12 is a guest perspective view of the lock housing when the lid is closed;

Fig. 13 is a home perspective view of a surface mounted lock of a lock housing;

Fig. 14 is a sectional view across 8-8 of Fig. 13, of a lock housing; and

Fig. 15 is a guest perspective view of the lock housing when the lid is opened.

- 5 According to prior art, a typical door 10 is hinged to a door frame 12, which is pre-fitted to a wall 14, as shown in Fig. 1. The door frame 12 and hinge 16 is clearly visible to the naked eye. The present invention uses a door frame 18, which is 1.5 mm to 5.0 mm thickness compared to a typical door frame 12 which is at least 25 mm. The thin door frame 18 makes the door 10 seamlessly blended to the wall 14, as shown in Fig. 2.

- An embodiment of the door frame 18 uses plaster stop 20 to conceal the door frame 18 from guest view as shown in Fig. 3. Doors 10 are usually one third thickness of a wall 14. A door 10 can be viewed from home view or guest view.
- 15 Usually, the door 10 swings out to guest view. The first embodiment does not give a concealed effect from home's view.

- Timber, metal or plastic, or any material that does not shrink, twist or warp may be used as the door frame 18. The preferable material is metal 22, which may be bent or extruded with profiles to suit the door 10 and wall 14 as shown in Fig. 4, which shows a detailed sectional profile of the metal 22 with an optional rebate 24. Another embodiment of the door frame 18 uses a modified metal 26 attached to timber 28 as shown in Fig. 5, with an optional rebate 30. The timber (28) is placed along the metal (26) and exposed to one side of the door. Fig. 6 shows another embodiment using cement 58 between the door and wall and plaster stop 20 with an optional rebate 30. The cement 58 forms a bind for plaster stop so that it won't face premature crack. Gypsum may be used in place of cement 58.

- 30 For door openings into stairs or corridors, the door 10 appears to be sunken into wall 14 from home view even if it uses a thin frame 18. To overcome this, a rebated door 32 is used instead and is placed on the visible side of the door, as shown in Fig. 6.

For a series of doors, the same question of visible door frame 12 and hinges 16 arise as shown in Fig. 8. The invention covers a series of doors as shown in Fig. 9 to Fig. 11. For a series of doors 34, mullions 36, a form of divider is used to separate one compartment from the other compartment. A single, single, double
 5 door is used as an example for demonstration.

The first mullion embodiment 36 is made of hollow shortened frame so that it is not visible from guest view, as shown in Fig. 10. The width of the mullion is shorter than the thickness of the wall. The second mullion embodiment 38 has a
 10 'U' shape as shown in Fig. 11. The hollow area faces guest view.

A special offset pivot 40 is used to match a much thinner frame to swing the door 10. Concealed hinges are adapted to the door to give a neat and clean appearance.

For single stand-alone doors, conventional cylindrical or mortice locks can be
 15 used, as there are still enough material to open a strike plate to take the latch. For doors in a series 34, where the mullions are located only at home view, a novel lock housing is used instead, as shown in Fig. 12 to Fig. 15. Conventional locks with latches along the centre of the door are not suitable, as the mullion does not extend to the edge of the door to allow the latch to secure it.

20 The novel lock is surface mounted on the home view side of the door, which can be operated with a cylinder key if necessary, as shown in Fig.13. Surface mounted lock 42 is installed through the door by drilling. The lock housing 52 at this side of the door allows the latch 56 to be secured to the mullion (36, 38). A
 25 lever 44 may be operated to lock by pushing the lever 44 towards the lock housing 42 and to unlock by pulling the lever 44 away from the housing 42 or vice versa.

This mullions cannot use conventional locks as there is no frame to latch to. The
 30 lock is modified to have a lid 46 to cover the key hole from guest view. The lid hinged at a position from the top and closed by gravity covers the guest housing 48. As it is hinged from a position from the top, pressing the top plate opens the

lid. This action reveals the key hole 50. Holding the lid 46 open with one hand, a key 52 can be inserted into the cylinder to open the lock. Once the latch is retracted, the lid is used 46 as a handle to pull the door open. The invention describes the lock housing and it can be used for any lock regardless of the locking mechanism. The lock housing allows a neat, clean and uncluttered look while maintaining the requirement to lock, handle, cylinder key operation, latch or bolt.

The combination of above mentioned embodiment offers a concealed door frame for a door or a series of doors.