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Method to screen windows and doors to prevent insect entry either by Manufacture or Insitu Installation.

BACKGROUND OF THE PRESENT INVENTION

5 The invention and method together relates to a window or door screen of the type which restricts the entry of insects and the like, with a method for installing a screen insitu.

At present a number of different constructions of screen, which are normally called fly or insect screens, are available and there are only two constructions which are readily available. The first is a full size window/door screen mounted in or on a rigid frame e.g. an aluminium or wooden frame which screen is mounted inside or outside an existing window or door.

15 The alternative is an insect screen of the type described and claimed in New Zealand Specification No. 180555. This screen includes the use of flexible magnetic tape fixed to both the screen and window/door frame to thereby form a readily removable screen.

20 The flexible magnet tape itself forms the frame around the complete periphery of the screen and window/door.

The problem with this type of construction is that it is difficult if not impossible for a user in a door situation to gain access because the screen does not lend itself to being opened. In addition the weight of a door sized screen means that if the screen is partly opened the magnets are not of sufficient



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strength to support the weight of the screen and inevitably the screen collapses.

SUMMARY OF THE PRESENT INVENTION

One object of the present invention and method is therefore to overcome, at least in part, the above identified disadvantages and to provide an insect screen for both windows and doors which at least offers the public a useful alternative choice and to construct same by the insitu method.

Further objects and advantages of the invention and method will become apparent from the following description which is given by way of example only.

According to a broadest aspect of the invention there is provided a window or door screen, the screen comprising a flexible laminated plastics screen frame with a mesh insert, the plastics frame can be aesthetically coloured, the laminated plastics screen frame being formed from lengths of a non-magnetic plastics strip and a plastics magnetic seal between which is sandwiched the mesh insert, the screen frame being supported by a non-magnetic keeper mounted on at least an upper part of a door or window frame, the keeper retaining at least an upper part of the periphery of the frame in contact with the door or window frame, the remaining periphery of the screen frame being held magnetically in its closed position by a ferrous or magnetic fastening means fixed to the door or window frame while being readily releasable to allow access through the door or window.



The fastening means or the keeper can be either multiple loops or hooks which extend along part or all of the length of one side or top of the frame and the remainder of the periphery of the frame can include a plastics magnetic locking seal to thereby allow for opening of the screen.

Alternatively the keeper can be a plastics or aluminium extrusion in which the plastics frame is engaged to retain the screen in position.

In yet another alternative the keeper is a series of screw fasteners which are engaged directly through the plastics frame to retain at least part of the frame in association with the door or window frame.

In accordance with a second aspect of the invention there is provided a window or door screen according to the invention wherein the frame has on opposite sides or top and bottom thereof a hinged means so that the portion thereof held to the door or window frame by the plastic magnetic locking seal is hingeable to allow it to be readily opened, the remainder of the frame being held to the door or window frame by the keeper. Further aspects of the invention which should be considered in all its novel aspects will become apparent in the following description which is given in the following example only

DESCRIPTION OF THE DRAWINGS

Examples of the invention will now be described with reference to the accompanying drawings in which:



Figure 1: shows a perspective view from the side of a first example of window or door screen according to the present invention;

Figure 2: shows a front elevation of an example of the invention adapted for use as a door screen;

Figure 3: shows a side elevational view of the door screen shown in Figure 2;

Figure 4: shows a front elevation of an example of the invention adapted for use as a window screen;

Figure 5: shows a side elevational view of the window screen shown in Figure 4; and

Figure 6: shows exploded apart and in section a joint between a keeper and a side or top edge of the frame.

Figure 7: shows a perspective view on a large scale of an example of hinge joint used on the example shown in Figures 2 and 3 in which the hinge joint is partially opened.

DETAILED DESCRIPTION OF THE INVENTION

In figure 1 the window or door screen shown has a frame 1 with a fibreglass mesh 2 insert. The frame 1 can be coloured and consist of a 13mm wide plastics strip which is bonded to the fibreglass mesh 2. The back 3 of the fibreglass mesh 2 has bonded to it as a keeper a 13mm wide strip 4 of multiple loops or hooks of the type sold under the Trade Mark Velcro and the subject of at least New Zealand Patent Specifications Numbers 120365 and 158804. The strip 4 being in a door situation at the

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top and part of the way down the hinge side or in a window situation along one side and if necessary a third of the way long the top and bottom.

5 In this example where the velcro ends at 5 there are butyl rubber inserts 6 which act as hinges. The hinges 6 separate the velcro strip 4 from a flexible magnetic strip 7 which is bonded directly to the back of the screen around the remainder of the periphery of the frame 1. The hinges 6 ensure that the screen does not open beyond the point 5 and pull away from the velcro fixing. 10 The frame 1 and mesh 2 at the hinge 6 can be strengthened by installing strengthening means 8 which are bonded to both the mesh 2 and frame 1.

The screen is preferably constructed so that the velcro, rubber hinge inserts and magnetic seal are all the same 15 thickness. It is therefore preferred that the thickness of the velcro, rubber, magnetic seals are similar.

A window frame not shown where the screen is to be installed is fitted with either the multiple loop or hook part of the velcro strips. The position of this matches exactly to the other 20 part of the velcro strip which is fixed on the back of the screen. The strip 4 is attached to the window frame by a suitable adhesive method, and the magnetic seal strips 7 are fixed in corresponding locations on the window frame to the magnetic seals on the screen.

Thus the screen is held semi permanently in place at the top

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and side by velcro, giving it high wind resistance. To open or close the window or door, the screen is lifted up from the bottom, the butyl rubber hinge inserts act as flexible hinges at one side, and the velcro holding the screen firmly to the window from that point.

The frame of the screen can be made of metal, wood, plastic or rubber.

The velcro can be either intermittently placed or be substantially placed along the top of the screen provided it is sufficient to carry the weight of the screen and keep it attached to the window frame. Alternatively on windows which open from side hinges the velcro can be fixed down the hinge side and along part or all of the top, in a continuous strip or intermittently. As an alternative to using Velcro loops it is envisaged that a strip of ordinary cloth with which velcro hooks can engage can be used on either the screen or window frame.

In a door situation the plastics frame can be fixed at the top to the door frame by other means including screws or other suitable fixing means which replace or are in addition to the velcro.

The magnetic strip in the present invention acts as a seal not as a frame for the fibreglass mesh.

In the examples shown in Figures 2 to 4 the parts of the screen similar to those described with reference to the first example are referenced by the same numerals.



In the example shown in Figures 2 and 3 a door is shown. The door has at the upper and lower corners 9 extra bracing for strength. The frame 10 for the mesh 2 is formed from a plastics strip 11 fixed by screws 12 to a door frame (not shown). At 13 on the side edges 14 of the screen are hinges 6. The placement of the hinges 6 is such that the door screen folds back to allow entry or egress through the door.

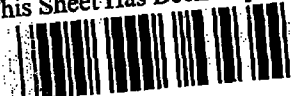
10 In the example shown in Figures 3 and 4 a top hung window 15 is shown. The window 15 being of smaller size and therefore less weight need not include this hinge means.

15 In the example shown in Figures 5 & 6 there is shown an alternative keeper. The keeper 16 is a plastics or aluminium extrusion which can be continuously or intermittently fixed along a top edge or side of the frame. The extrusion can, for example, be a plastics extrusion of the type used to support hardboard in joinery situations. The arm 17 of the extrusion 16 is sufficiently flexible to allow the frame supporting the mesh 2 to be clipped or slid into frictional engagement therewith.

20 The arm 17 including a lip 18 which engages over a raised region 19 formed along one edge of the frame 20.

The raised region 19 can be formed integrally with the frame 20 or may have been fixed thereto.

In use these examples are used in the same manner as the first example and provide a frame of which a part is semi



permanently fixed to the window while the remainder is held in position by another fastening means, for example, velcro or a flexible magnetic tape which is attached to the window or door frame or an oppositely poled magnetic strip mounted on the window or door frame.

In Figure 7 is shown in more detail a hinge joint 6. The hinge joint 6 being of the type shown in Figures 2 and 3.

In Figure 7 is shown a strip 21 at least the lower region 22 is a magnetic strip attached to the door frame (not shown). The plastics frame parts are indicated by strips 23 and 24. The lower strip 24 being hingeably attached to the strip 23 as s\described hereinafter.

Initially a triangular section 25 of flexible material like butyl rubber or a strong fabric is formed. The end 27 of the strip 24 being butted against the lower edge 26 of the section 25.

The mesh 2 is laid on the triangular section 25 and strip 24 is attached by a suitable adhesive.

A hinge member 28 is then fixed over the mesh 2. The hinge member being arrow head shaped as shown with an end 29 which extends to cover the butt joint between the strip 24 and section 25. Cut-away regions 30 are covered by the outer strips 31 and 32 which are fixed in position to complete the joint.

In use the hinge member 28 pivots as shown thereby allowing the screen at its lower point to move away from the magnetic strip 22.



A further aspect of this method is the unique advantage of building the screen insitu. As previously described the screen can be manufactured or built insitu. According to this aspect of the method there is provided a means of installing a screen with even tension, insitu on the window the method including the steps of:

Thoroughly cleaning a window frame to which the screen is to be fitted; drying off the window frame; fixing clockwise around the perimeter of the cleaned window frame a frametape under pressure; applying pre-adhesed screentape to the frametape with the magnetic polarity in the correct direction; carefully removing release tape from the pre-adhesed screentape; cutting mesh to roughly the size required for the screen; holding the mesh over the opening with light tension applied to left and right and pressing the edges to the exposed adhesive on the screentape; applying a similar light pressure to the bottom then one side and then the other; applying slight tension to make the mesh look firm; laying a silicon ruler on and carefully trim off any surplus mesh on all four sides; cutting pre-adhesed finishing tape from a coil to overlap the screentape;

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removing release liner and press finishing tape onto exposed mesh and screentape;

applying pressure using a pressure tool;

fixing corners and carefully remove the screen and cut in fixing clips;

fixing the clips in position so that the screen can be refitted.

A further aspect of the invention will become apparent from the following description which is given by way of example.

An example of the method will be described with reference to the accompanying drawings in which:

Figure 8 shows a front view of a corner of a window under preparation for the application of a screen;

Figure 9 shows a front view similar to that in Figure 8 of a newly completed screen; and

Figure 10 shows a cross section through the screen shown in Figure 9.

An example of the method will now be described with reference to the invention being used to make an insect screen. It is to be appreciated that the method can be used for the manufacture of other screens such as sun screens and acrylic screens to reduce heat and noise passing through glass windows as for double glazing.

As a first step the window frame 1 is thoroughly cleaned and then dried off.

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5 Frametape 2 is then fixed flush around the perimeter of the cleaned window frame starting with the left-hand side, top, right-hand side and bottom. The frametape 2 must be orientated with the correct magnetic polarity as indicated by the arrows shown. Pressure is then applied to the frametape.

Pre-adhesed screentape 3 is cut to length and laid on top of the window frame and frametape with magnetic polarity running in the correct direction. The release tape on the screentape is then removed to expose the adhesive.

10 Mesh 4 is then cut roughly to size and held up over the window frame. Light tension is applied to left and right and then the mesh is pressed onto the pre-adhesed screentape 3.

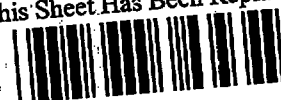
The step is then repeated for the bottom, then one side and then the other side. Light tension is then applied to the mesh 4
15 to make it look tight.

A silicon ruler (not shown) is laid on the screentape and carefully trim off the surplus on all four sides.

20 A pre-adhesed finishing tape 5 is cut to length so as to overlap the screentape so as not to form a butt-joint, rather an overlapping join out of phase with the frametape. The release tape on to tape 5 is removed and the tape 5 is pressed onto the exposed mesh and screentape.

Pressure is applied using a pressure tool. The corners are fixed by a triangular piece of plastic adhered to the 4 corners of the screen.

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The screen is then carefully removed and clips cut in. The screen can then be refitted.

Advantages of the method are the big savings in labour costs and the screen is built in situ.

5 Thus by the method there is provided a method of installing a screen with even tension.

A particular example has been described and it is envisaged that improvements and modifications can take place without departing from the scope thereof.

10 Thus by this invention there is provided an improved insect screen for windows and doors.

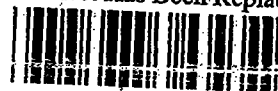
Particular examples have been described and it is envisaged that improvements and modifications can take place without departing from the scope of the appended claims.

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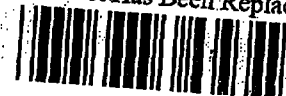
or door screen, the screen comprising a flexible laminated plastics screen frame with a mesh insert, the plastics frame can be aesthetically coloured, the laminated plastics screen frame being formed from lengths of a non-magnetic plastics strip and a plastics magnetic seal between which is sandwiched the mesh insert, the screen frame being supported by a non-magnetic keeper mounted on at least an upper part of a door or window frame, the keeper retaining at least an upper part of the periphery of the frame in contact with the door or window frame, the remaining periphery of the screen frame being held magnetically in its closed position by a ferrous or magnetic fastening means fixed to the door or window frame while being readily releasable to allow access through the door or window.

- 2 A window or door screen as claimed in claim 1 wherein the remainder of the door or window frame includes a plastics magnetic locking seal as part of the fastening means.
- 3 A window or door screen as claimed in claim 2 wherein the screen frame has on opposite sides or top and bottom thereof hinge means so that the portion thereof held to the door or window frame by the plastics magnetic locking seal is hingeable to allow it to be readily opened, the remainder of the screen frame being supported on the door or window frame by the keeper.
- 4 A window or door screen as claimed in any one of the



preceding claims wherein the keeper is multiple loops or hooks which extend along part or all of the length of one side and along at least part of the top of the screen frame or the door or window frame.

- 5 A window or door screen as claimed in any one of claims 1 to 3 wherein the keeper is a plastics or aluminium extrusion in which the plastics screen frame is engaged to support the screen in position.
- 6 A window or door screen as claimed in any one of claims 1 to 3 wherein the keeper is a series of screw fasteners which are engaged directly through the plastics screen frame to support at least said upper part of said frame to the door or window frame.
- 7 A window or door screen as claimed in any one of the preceding claims wherein the mesh insert is constructed from a fibreglass mesh material.
- 8 A window or door screen as claimed in any one of the preceding claims wherein the plastic strip lengths of the screen frame are formed from strips of plastics material cut from a sheet of plastic material, or extruded to suit.
- 9 A window or door screen as claimed in any one of the preceding claims wherein at least one hinge is formed in the plastics screen frame, the hinge being formed from a piece of rubber fitted in place of part of one of the said plastics strips, the piece of rubber being of the same width





and thickness as the said strip.

- 10 A window or door screen as claimed in any one of the preceding claims wherein the corners of the plastics screen frame are braced by triangular shaped brace members manufactured from a plastics material.
- 11 A window or door screen substantially as hereinbefore described with reference to Figure 1 of the accompanying drawings.
- 12 A door screen substantially as hereinbefore described with reference to Figures 2 and 3 of the accompanying drawings.
- 13 A window screen substantially as hereinbefore described with reference to Figures 4 and 5 of the accompanying drawings.
- 14 A door or window screen substantially as hereinbefore described with reference to Figure 6 of the accompanying drawings.
- 15 A method as to how to construct a screen using the window frame as the working plane ie insitu build up.
- 16 A method as claimed in the claim as where in the tension can be applied evenly around the perimeter.
- 17 A huge saving is labour and travelling costs as one trip to the window is all that is needed instead of one trip to measure up and another trip back to install and fit the manufactured screen to the window.

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