

TITLE

"AN INTRUDER RESISTANT SCREEN"

FIELD OF THE INVENTION

THIS INVENTION relates to an intruder
5 resistant screen particularly useful for both security
and insect screening of windows, doorways and the
like.

BACKGROUND OF THE INVENTION

Screens or grilles are sometimes used to
10 improve the security of a building. For example,
steel bar grilles have been used to deter intruders
from entering a premises through a window or door.
When used for a window the steel bar grilles are
bolted to a wall surface adjacent the window. When
15 used for a doorway the steel bar grilles are pivotally
mounted to the doorway and operate as an extra door.

Steel bar grilles are generally considered
unsightly and are therefore usually only used for
industrial buildings, shops and some places of
20 business. Furthermore, the spacing between the steel
bars of the grilles is usually wide enough to allow
bolt cutters or hacksaws to cut the bars and therefore
such grilles do not always provide adequate security.

An alternative to steel bar grilles are
25 security screens which are often used to deter
intruders from entering a premises through a window or
door. Security screens comprise an extruded frame
with a wide grate mesh covering the area enclosed by
the extruded frame. The wide grate mesh typically has
30 elongate members of 7mm diameter with mesh gaps of
approximately 60mm. The mesh is normally fitted into a
slot in the frame and is not usually clamped to the
frame. One reason for this is because the wide grate
mesh is usually made from expanded aluminium which is
35 not suited to bolting due to the spaced small surface
areas of the mesh which contact the frame. In
addition, the contours of the mesh would require

accurate and specific alignment of bolt holes for each screen which is labour intensive. Accordingly, it is possible for a potential intruder to remove the unbolted mesh partly or completely from the frame.

5 Such security screens also suffer from the same disadvantages as steel bar grilles in that the mesh can be cut by bolt cutters or hacksaws.

 The above described screens or grilles can provide limited security even when their associated
10 window or door is opened for ventilating a premises. However, these screened or grilles are not effective for insect screening and therefore fine mesh screens are sometimes used in conjunction with security
15 screens or grilles for the purpose of insect screening. The fine mesh is usually either mounted to a wooden frame or mounted to a spline of the extruded frame of the screen in which a rubber strip is used to maintain edges of the mesh in the spline.

 The above fine mesh screens are not intruder
20 resistant as the wooden frame can be easily broken or the mesh can be easily removed from the spline. Furthermore, the fine mesh which is used is often made of thin nylon or thin metal strands which can be easily broken. Accordingly, to provide limited
25 security and insect screening both fine mesh screens and security screens or grilles are often used which has the disadvantage of increased manufacturing or installation costs.

SUMMARY OF THE INVENTION

30 It is an object of the invention to provide an intruder resistant screen which overcomes or at least alleviates at least one of the problems associated with prior art screening of doorways, windows or the like.

35 According to one aspect of the invention there is provided an intruder resistant screen including:

a frame comprising elongate frame members each having a channel section engaging a respective corner stake in each end thereof;

5 a woven wire intruder resistant mesh covering an opening enclosed by said frame said mesh having spacings between adjacent wefts or warps of no greater than 2.2mm; and

10 a plurality of clamping members co-acting with respective fastening means to thereby clamp said mesh to said frame.

Suitably, each one of said frame members has at least two co-acting said clamping members integral therewith.

15 Alternatively, each one of said frame members may have a first one of said clamping members integral therewith co-acting with one or more separately formed second said clamping members. Accordingly, the second said clamping members may be non-integral with a said frame member.

20 Suitably, said clamping members extend along the length of a respective frame member.

Alternatively, said second clamping members may include a plurality of washers or shoulder portions of a respective said fastening means.

25 The woven wire is preferably stainless steel wire of a diameter between 0.5mm to 1.2mm.

Suitably, said spacings are in the range between 1mm to 2.1mm.

30 The frame members may be extruded lengths, roll formed lengths or press formed.

Suitably, the frame members are extruded aluminium lengths.

Preferably, said channel section may be open or alternatively closed.

35 Suitably, said clamping members are located inwardly relative to said channel section.

Preferably, there is a wall section integral



with said channel section, said wall section extending inwardly of said channel section and spaced from said clamping members.

Alternatively, one of said clamping members
5 may form part of said wall section.

Preferably, there is a lip section adjacent a free end of said wall, wherein said lip section extends towards said mesh.

Suitably, said lip section may co-act with
10 one of said clamping members to thereby clamp said mesh therebetween.

Suitably, there is a flange section integral with and extending inwardly from said channel section.

Preferably, said flange section and said
15 wall section provide a recess accommodating an edge of a said second one of said clamping members.

Suitably, said flange section abuts said second one of said clamping members.

Preferably, said screen has cover engagement
20 means for allowing a cover strip to be mounted thereto and thereby concealing said fastening means when said screen is viewed from an inner side.

Suitably, said cover engagement means includes two parallel slots. Alternatively, said cover
25 engagement means may be a channel in said frame member.

The fastening means may be rivets or screws. The screws may be self tapping or otherwise. Alternatively, the fastening means may be snap
30 fitments

Suitably, said wall section conceals said fastening means when said screen is viewed from an outer side.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be readily understood and put into practical effect, reference will now be made to preferred embodiments in which:

5 FIG 1 is a perspective view of an intruder resistant screen,

 FIG 2 is a cross sectional view through A-A of FIG 1 illustrating a first embodiment of the invention,

10 FIG 3 is an exploded perspective view illustrating how frame members of FIG 2 form a corner section,

 FIG 4 is a cross sectional view through A-A of FIG 1 illustrating a second embodiment of the invention,

15 FIG 5 is a cross sectional view through A-A of FIG 1 illustrating a third embodiment of the invention,

20 FIG 6 is an oblique cross sectional view through A-A of FIG 1 illustrating a fourth embodiment of the invention, and

 FIG 7 is an oblique cross sectional view through A-A of FIG 1 illustrating a fifth embodiment of the invention.

25 DETAILED DESCRIPTION

With reference to FIG 1 there is illustrated an intruder resistant screen 1 having a frame 2 comprised of elongate frame members 3 with an intruder resistant mesh 4 clamped to frame members 3.

30 Mesh 4 covers the opening enclosed by frame 2. Mesh 4 is a woven grid, of stainless steel wire which has dimensions selected from table 1 below.

TABLE 1

	Number of Mesh Wires per 25mm	Wire Diameter in mm	Mesh open area	weft/warp spacings in mm
5	14 x 14	0.8	29.8%	0.1mm
	14 x 14	0.7	36.2%	1.1mm
	14 x 14	0.5	31.0%	1.3mm
	12 x 12	1.0	25.4%	1.0mm
10	12 x 12	0.9	33.2%	1.2mm
	12 x 12	0.7	43.6%	1.4mm
	12 x 12	0.6	51.8%	1.5mm
	10 x 10	1.2	28.1%	1.3mm
	10 x 10	1.0	34.8%	1.0mm
15	10 x 10	0.9	42.3%	1.6mm
	10 x 10	0.8	46.2%	1.7mm
	10 x 10	0.7	51.8%	1.8mm
	8 x 8	1.2	38.9%	2.0mm
	8 x 8	1.0	45.2%	2.1mm
20	8 x 8	0.9	51.8%	2.2mm

Referring to FIGS 2 and 3, an embodiment of one of frame members 3 is illustrated. Frame member 3 is formed from extruded aluminium and has a channel section 5 for receiving a corner stake 10 at each of its ends. Accordingly, frame 2 is formed to a desired shape and dimensions by cutting suitable lengths of each frame member 3 and assembling the lengths with mitred corners.

Located inwardly of channel 5 is an integral clamping member 6 and a non-integral clamping member 7 which is a separately formed from frame member 3. Both clamping members 6,7 are of an identical length

and extend along the length of frame member 3. Spaced holed are drilled along clamping members 6,7 and receive fastening means in the form of a pop-rivets 8 which co-act with clamping members 6,7 to clamp mesh 4 to frame 2.

An integral wall section 9 spaced from clamping members 6,7 also extends inwardly from channel section 5. At the free end of wall section 9 is a lip section 11 which extends towards mesh 4 and co-acts with clamping member 7 to also clamp mesh 4. This therefore provides a clamping arrangement which reduces the possibility of an intruder forcing, for example, a lever between clamping members 6,7.

A flange section 12 integral with an extending inwardly from channel section 5 forms, with wall section 9, a recess 13 which accommodates an edge of clamping member 7 and an edge of mesh 4. Flange section 12 abuts clamping member 7 and assists in keeping clamping members 6,7 parallel during clamping. Further, clamping member 7 has two parallel slots 14,15 for attaching a flexible covering strip 16 which therefore covers the heads of pop-rivets 8.

As shown in FIG 3 two frame members 3 are attached together at a corner of frame 2 by corner stake 10 being inserted into a channel section 5 of two mitred frame members 3. Holes are then drilled into edges of frame members 3 and corner stake 10. Pop-rivets 17 are then inserted for securing frame members 3 to corner stake 10.

Illustrated in FIG 4 is a second embodiment of one of frame members 3 which is either roll formed or extruded. In this embodiment clamping member 6 is part of wall section 9 and self tapping screws 18 co-act with clamping members 6,7 to clamp mesh 4 to frame 2.

Referring to FIG 5 a third embodiment of one of frame members 3 is illustrated. Each frame member



3 is press formed to provide a channel 20, integral clamping members 21,22 co-acting with rivets 24 to clamp mesh 4 to frame 2.

5 There is also a wall section 25 and parallel slots 26,27 for attachment of a cover strip. Frame members 3 are attached by corner stakes inserted in channel 20 as described above.

10 Illustrated in FIG 6 is a fourth embodiment of one of frame members 3. In this embodiment there are two clamping members 30, 37, wherein clamping member 37 is 0 a free end of lip section 11. An intermediate wall portion 33 provides two channels, one being a clamping member 30 engagement channel 34 for receiving engagement legs of clamping member 30
15 the other being a mesh receiving channel 36.

20 The walls of channel 34 have snap fitment protrusions 32 for engagement with snap fitment protrusions 33 at the ends of two parallel legs 35 extending from clamping member 30. Mesh 4 is clamped to frame member 3 by bending and edge of mesh 4 and inserting it into channel 36. Clamping member 30 is then inserted into channel 34 in which snap fitment protrusions act as a fastening means thereby mesh 4 is clamped between clamping members 30 and 37.

25 Referring to FIG 7 a fifth embodiment of one of frame members 3 is illustrated. In this embodiment there is a first clamping member 38 integrally formed with frame member 3. First clamping member 38 is spaced from a wall section 39 and apertures 40 are
30 drilled along the length of clamping member 38 to receive fastening means in the form of pop-rivets 40. Each one of pop-rivets 40 has an associated washer 41 acting as a second clamping means. Accordingly, mesh 4 is clamped to frame 2 between washers 41 and clamping
35 member 38. In an alternative form if the heads of pop-rivets are wide enough, the shoulder portion thereof can act as a clamping member instead of washers 41.



A cover strip 42 with a channel 43 can be inserted into a complimentary channel 44 of frame member 3 thereby concealing pop-rivets 40 when viewed from an inner side and wall section 39 conceals pop-rivets 40 when viewed from an outside. Cover strip 42 has a recess 45 for engagement with a lip section 46 of frame member 3 which assists in maintaining attachments of cover strip 42 to frame member 3.

In use intruder resistant screen 1 may be mounted on hinges in a doorway or secured in any known manner to a window frame. Mesh 4 provides difficulties for intruders as a sufficiently large hole to gain entry cannot be easily sawn or cut by bolt cutters due to the mesh grade which also provides insect screening. Furthermore, when stainless steel mesh 4 is used these difficulties for potential intruders can be compounded due to the properties of stainless steel which can blunt cutting tools.

The clamping of the mesh provides additional intruder resistance in which wall sections 9 (or 25) are located on the outside of the doorway or window so that for example rivets 8 are concealed from a potential intruder.

When viewed on the inside, rivets 8 are hidden by cover 16 which is of a colour matching jaw member 7.

Although the invention has been described with reference to preferred embodiments, it is to be understood that the invention is not limited to the specific embodiments described herein.



CLAIMS:

1. An intruder resistant screen including:
a frame comprising elongate frame members
each having a channel section engaging a respective
5 corner stake in each end thereof;
a woven wire intruder resistant mesh
covering an opening enclosed by said frame said mesh
having spacings between adjacent wefts or warps of no
greater than 2.2mm; and
10 a plurality of clamping members co-acting
with respective fastening means to thereby clamp said
mesh to said frame.
2. An intruder resistant screen as claimed in
claim 1, wherein each one of said frame members has at
15 least two co-acting said clamping members integral
therewith.
3. An intruder resistant screen as claimed in
claim 1, wherein each one of said frame members has a
first one of said clamping members integral therewith
20 co-acting with one or more separately formed second
said clamping members.
4. An intruder resistant screen as claimed in
claim 2, wherein said clamping members extend along
the length of a respective frame member.
- 25 5. An intruder resistant screen as claimed in
claim 3, wherein said clamping members extend along
the length of a respective frame member.
6. An intruder resistant screen as claimed in
claim 3, wherein said second clamping members include
30 a plurality of washers or shoulder portions of a
respective said fastening means.
7. An intruder resistant screen as claimed in
claim 1, wherein the woven wire is stainless steel
wire of a diameter between 0.5mm to 1.2mm.
- 35 8. An intruder resistant screen as claimed in
claim 7, wherein said spacings are in the range
between 1mm to 2.1mm.





9. An intruder resistant screen as claimed in claim 8, wherein the frame members are extruded aluminium lengths.
- 5 10. An intruder resistant screen as claimed in claim 1, wherein said clamping members are located inwardly relative to said channel section.
- 10 11. An intruder resistant screen as claimed in claim 1, wherein there is a wall section integral with said channel section, said wall section extending inwardly of said channel section and spaced from said clamping members.
12. An intruder resistant screen as claimed in claim 11, wherein one of said clamping members forms part of said wall section.
- 15 13. An intruder resistant screen as claimed in claim 11, wherein there is a lip section adjacent a free end of said wall, and wherein said lip section extends towards said mesh.
- 20 14. An intruder resistant screen as claimed in claim 12, wherein there is a lip section adjacent a free end of said wall, and wherein said lip section extends towards said mesh.
- 25 15. An intruder resistant screen as claimed in claim 13, wherein said lip section co-acts with one of said clamping members to thereby clamp said mesh therebetween.
- 30 16. An intruder resistant screen as claimed in claim 14, wherein said lip section co-acts with one of said clamping members to thereby clamp said mesh therebetween.
- 35 17. An intruder resistant screen as claimed in claim 11, wherein there is a flange section integral with and extending inwardly from said channel section.
18. An intruder resistant screen as claimed in claim 17, wherein said flange section and said wall section provide a recess accommodating an edge of a said second one of said clamping members.





19. An intruder resistant screen as claimed in claim 18, wherein said flange section abuts said second one of said clamping members.

5 20. An intruder resistant screen as claimed in claim 1, wherein said screen has cover engagement means for allowing a cover strip to be mounted thereto and thereby concealing said fastening means when said screen is viewed from an inner side.

10 21. An intruder resistant screen as claimed in claim 20, wherein said cover engagement means includes two parallel slots.

22. An intruder resistant screen as claimed in claim 20, wherein said cover engagement means is a channel in said frame member.

15 23. An intruder resistant screen as claimed in claim 1, wherein the fastening means include rivets or screws.

20 24. An intruder resistant screen as claimed in claim 1, wherein the fastening means are snap fitments.

25 25. An intruder resistant screen as claimed in claim 11, wherein said wall section conceals said fastening means when said screen is viewed from an outer side.

