March 13, 1973 G. E. FRALICK ET AL 3,720,256

SCREEN FRAMING CONSTRUCTION

Filed Sept. 16, 1971

Fig. 1.

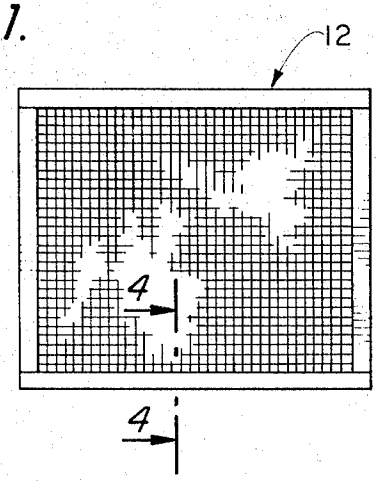


Fig. 2.

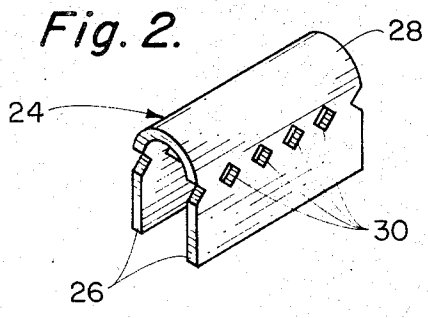


Fig. 3.

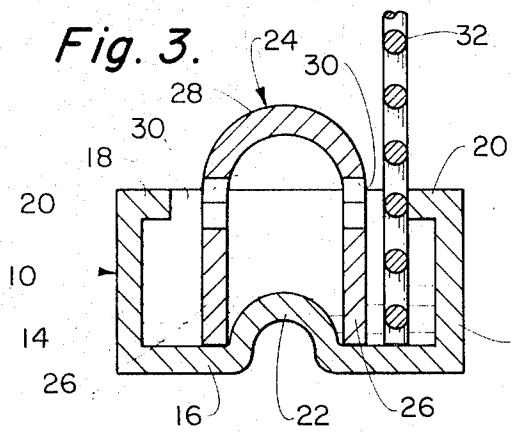


Fig. 4.

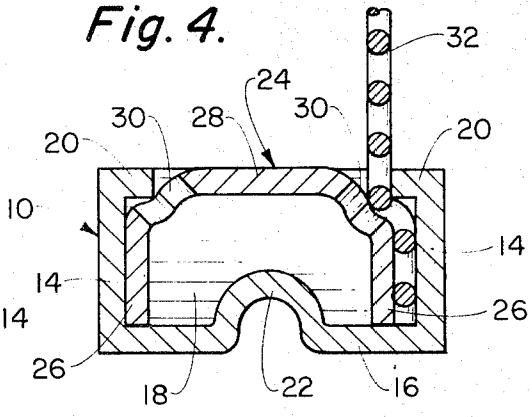


Fig. 5.

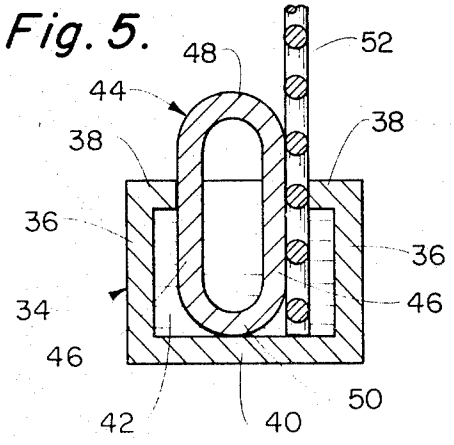
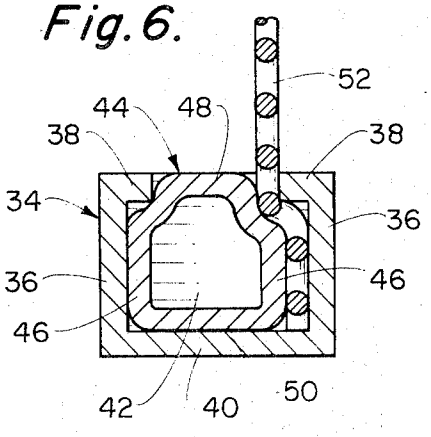


Fig. 6.



INVENTORS.
GEORGE EDWIN FRALICK
ROY ALBERT FRALICK
BY MAHONEY, HORNBAKER
AND SCHICK
ATTORNEYS

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SCREEN FRAMING CONSTRUCTION

George E. Fralick, 1177 Avocada Crest, La Habra, Calif. 90631, and Roy A. Fralick, 15944 Lujon, Hacienda Heights, Calif. 91745

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ABSTRACT OF THE DISCLOSURE

A frame member has spaced side walls joined by a bottom wall to form a generally U-shaped cross-section, the extremities of the side walls being formed with inwardly projecting flange portions partially overlying the bottom wall. A hollow clamping member is received within the frame member resting against the frame member bottom wall with clamping member side walls extending adjacent the side wall flange portions of the frame member and a top wall of the clamping member outwardly of the frame member. Thus, with deformable sheet material inserted within the frame member, between one of the frame member side walls and its corresponding clamping member side wall, and with downward deforming pressure applied to the clamping member top wall, the clamping member is transversely deformed forcing the clamping member side wall to clamp transversely against the frame member side walls and outwardly against the side wall flange portions of the clamping member correspondingly clamping the deformable sheet material therebetween. In one form of the clamping member, an inverted, U-shaped cross-section configuration cooperates with an upward protrusion of the frame member bottom wall to accomplish the clamping, and in another form the clamping member is annular in cross-section for accomplishing the clamping.

BACKGROUND OF THE INVENTION

This invention relates to a screen framing construction and more particularly, to such a construction for securely and pemanently clamping edge portions of deformable sheet material such as screen material and the like in a frame member in a manner preventing disassembly thereof without a complete destruction of the frame member. Even more particularly, this invention relates to such a screen framing construction wherein a clamping member is inserted into a frame member with deformable sheet material inserted into the frame member adjacent the clamping member, after which, permanent deformation of the clamping member securely clamps the sheet material in the frame member in a manner assuring that the sheet material cannot be separated from the frame member thereafter without the destruction of the frame member.

One of the fast increasing problems in our modern society is the security of residences and business establishments. Various increased locking and bolting mechanisms are being added to doors and those windows which are not permanently secured closed in an effort to frustrate the rising incidence of illegal entry. With the doors, of course, increasing the lock and bolt security is sufficient for the purpose and these may be provided sufficiently strong to prevent entry by anyone not completely destroying the doors.

With windows, however, a completely different problem is presented since even though the windows may be secured closed by proper locks and bolting, windows still contain glass which may be relatively easily cut and removed. Thus, the only answer is to provide an additional barrier which will not only permit light and ventilation

therethrough, but will be sufficiently strong for preventing access to the window glass by someone attempting surreptitious entry. The obvious answer is screening, but the desired security has not been satisfied by the prior screening constructions.

For instance, in the conventional screening constructions, the sheet-like screens are retained in the frames merely by clips or resilient wedging members. In view thereof, it is relatively easy to separate the screening materials from their frames and entry therethrough providing ready access to the glass of the windows becomes likewise relatively easy.

OBJECTS AND SUMMARY OF THE INVENTION

It is therefore, an object of this invention to provide a screen framing construction which, when once assembled, requires a destruction of the frame of the screen in order to separate the screening material or other deformable sheet material therefrom, thereby frustrating ready access therethrough. With the novel screen framing construction of the present invention, once the screening material has been edgewise assembled, extending into the frame member and the clamping member has been deformed into final position, it is impossible to separate the screening material from the frame member without a complete destruction of such frame member. Thus, with the overall screen assembly secured in place covering a window, the only manner of access through the window is by a complete destruction of the screen assembly.

It is a further object of this invention to provide a screen framing construction having the foregoing attributes yet which may be quickly and easily assembled without the danger of improper assembly so as to always assure the proper security and strength sought. With the frame member and clamping member parts properly formed and compatible, it is only necessary, during assembly, to quickly insert the clamping member into the frame member with the sheet material or screening edgewise inserted therebetween, and by the application of a simple deforming force against a protruding portion of the clamping member, the assembly is completed in final form with the screening securely engaged and gripped. Despite the simplicity of assembly and final deformation of the clamping member, the unique configurations of the cooperating parts assures that the screening material cannot thereafter be removed from the assembly without a complete destruction of the framing member.

It is also an object of this invention to provide a screen framing construction incorporating all of the above advantages which retains simplicity for maximum economics. In either of the best embodiments contemplated and illustrated herein, the frame member and clamping member parts, although of unique cooperating configurations, are of relatively simple form capable of economical mass production, while the screening or other sheet material may be of conventional form. Thus, the extreme advantages and sought after increased security are attained without sacrificing simplicity and the resulting desirable economical final assemblies.

Other objects and advantages of the invention will be apparent from the following specification and the accompanying drawing which are for the purpose of illustration only.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a front view showing a finished screen incorporating the screen framing construction of the present invention;

FIG. 2 is an enlarged, fragmentary, perspective view showing a clamping member forming part of the assembly of one embodiment of the screen framing construction of the present invention;

FIGS. 3 and 4 are enlarged, fragmentary, transverse sectional views looking in the direction and at the location of the arrows 4—4 in FIG. 1, FIG. 3 showing the first embodiment of the screen framing construction of the present invention in assembled configuration prior to being deformed into clamping configuration and FIG. 4 showing the same in final clamped configuration; and

FIGS. 5 and 6 are views similar to FIGS. 3 and 4 respectively, but showing a second embodiment of the screen framing construction of the present invention.

DESCRIPTION OF THE BEST EMBODIMENTS CONTEMPLATED

Referring to FIGS. 1–4 of the drawing, a first embodiment of the screen framing construciton of the present invention is illustrated and includes an elongate, generally U-shaped cross-section frame member generally indicated at **10** forming a rectangular peripheral screen frame generally indicated at **12** and shown in FIG. 1, the frame member **10** having opposite side walls **14** joined by a bottom wall **16** to form a generally U-shaped cross-section opening **18**. Furthermore, the side walls **14** terminate at their free ends in oppositely inwardly projecting flange portions **20**, while the bottom wall **16** is formed with a longitudinally extending, transversely centrally intermediate projection **22** extending into the U-shaped opening **18**. The frame members **10** forming the screen frame **12** may consist of any rigid material highly resistant to deformation by usual prying tools, examples of such material being, steel, thickened aluminum and certain of the more recent highly shock resistant plastics.

In this first embodiment, the screen framing construction of the present invention further includes an elongate, hollow cross-section, in this case inverted generally U-shaped cross-section, clamping member generally indicated at **24** formed by opposite side walls **26** joined upwardly of the frame member **10** by a top wall **28**, the latter being arcuate in cross-section prior to deformation as shown in FIGS. 2 and 3. Also, prior to deformation or in assembly configuration, particularly as shown in FIG. 3, the clamping member **24** is received within the frame member **10** with the extremities of the clamping member side walls **26** resting downwardly on the frame member bottom wall **16** straddling the projection **22** of the frame member bottom wall, the clamping member top wall **28** at this time, projecting appreciably above the frame member **10** or upwardly of the frame member U-shaped opening **18**. Also, the clamping member side walls **26** extend inwardly along the flange portions **20** of the frame member side walls **14** and at these locations in the assembly configuration of the clamping member **24**, the clamping member is formed with a series of preferably longitudinally spaced and generally longitudinally aligned perforations therethrough at each of the side walls **26** providing weakened portions on the clamping member to aid in desired deformation thereof as will be hereinafter explained.

For purposes of the present invention, the clamping member **24** is formed of a relatively rigid material, but that which is deformable from relatively high forces exerted thereon, steel and thickened aluminum again being prime examples, depending on the final security required. It should be understood, however, that the principals of the present invention are not intended to be restricted to the particular materials designated, such materials only being given as workable examples. For instance, of the suggested materials, where maximum security and strength of the final screen framing construction is desired, various of the high-strength steels may be used, but where lesser security and strength is satisfactory, the lesser strength steels and aluminum and high-impact plastic at least for the frame member **10** may be used.

To complete the screen frame **12** with the clamping member **24** still in the assembly configuration prior to deformation thereof, deformable sheet material such as screening **32** is edgewise positioned within the frame member **10** adjacent the clamping member **24**, that is, transversely between one set of the frame and clamping member side walls **14** and **26** as shown in FIG. 3. Again, the screening **32** may be of various materials depending on the strength and security required for the overall screen framing construction. At the same time, various other deformable sheet materials may be used depending on the conditions required or desired.

As shown by comparing FIGS. 3 and 4, the screen framing construction is completed by applying deforming forces or pressure against the top wall **28** of the clamping member **24** forcing the clamping member side wall **26** at one side transversely against the frame member side wall **14** with the clamping member engaging beneath and inwardly along the flange portion **20** of that frame member side wall. At the same time, during such deformation of the clamping member **24**, the opposite clamping member side wall **26** is forced transversely outwardly to clamp the screening **32** against the opposite frame member side wall **14** and beneath and along the opposite side wall flange portion **20**. This proper deformation of the clamping member **24** is guided by the projection **22** in the frame member bottom wall **16** which prevents the clamping member side walls **26** from moving transversely together, as well as the perforations **30** at the opposite sides of the clamping member **24** providing weakened portions which will intially and more easily deform upon application of the forces and pressure.

The end result is the clamping member **24** in its final permanently deformed configuration as shown in FIG. 4, securely clamps between the frame member side walls **14** and clamps the screening **32** in the frame member **10**. With this permanent final deformation of the clamping member **24**, it is impossible to remove either the clamping member or the screening **32** without a complete destruction of the frame member **10**. Thus, a final assembled screen framing construction is provided which will provide security when permanently fastened over a building opening, the degree of security provided being determined by the particular materials used, the important point being that the screening **32** or other deformable sheet material can never be removed from the construction without a complete destruction of the frame member **10**.

A second embodiment of the screen framing construction of the present invention is shown in FIGS. 5 and 6 and includes a frame member generally indicated at **34** virtually identical to that of the first embodiment with the transverse dimensions or width thereof being slightly reduced but still including side walls **36** terminating upwardly in flange portions **38** and joined downwardly by a bottom wall **40**, again forming a U-shaped opening **42**. A similar clamping member generally indicated at **44** is of hollow cross-section, in this case, annular in cross-section formed by side wall **46**, a top wall **48** and a bottom wall **50**. The materials may be of the same choice depending on the conditions to be met.

In assembly configuration, the clamping member **44** is received within the frame member **34** and screening **52** or similar deformable sheet material is edgewise inserted likewise into the frame member **34** between one set of the frame and clamping member side walls **36** and **46** as shown in FIG. 5. The final deforming forces and pressure are exerted against the clamping member **44**, forcing the clamping member **44** fully within the frame member **34** into deformed clamping configuration. In such configuration, the one clamping member side wall **46** clamps transversely outwardly against the adjacent frame member side wall **36** and beneath and around that side wall flange portion **38**, while the other clamping member side wall clamps transversely outwardly against that frame member

side wall with the screening 52 therebetween permanently securing the screening within the frame member as shown.

Thus, preferred embodiments of the screen framing construction of the present invention are shown and described which provide screen framing construction of maximum security, far greater than that heretofore provided, and particularly screen framing construction in which it is impossible to remove the screening or other deformable sheet material from the frame member without a complete destruction of such frame member. Furthermore, despite the extreme security provided by the screen framing construction of the present invention, due to the unique configurations of the frame and clamping members, it is possible to assemble the same in a relatively easy and foolproof manner, such assembly always assuring that the final strength of assembly will be provided. Still further, even with the foregoing advantages, the various components of the screen framing construction may be provided for a relatively economical cost.

We claim:

1. In a frame construction for framing screen and other deformable sheet material, the combination of: an elongate, generally U-shaped cross-section frame member having opposite side walls joined by a bottom wall defining a generally U-shaped cross-section opening, said frame member side walls terminating at free ends thereof in oppositely inwardly projecting flange portions projecting into said frame member central opening; and an elongate, hollow cross-section clamping member having opposite side walls upwardly joined by a top wall, said clamping member in assembly configuration being positionable downwardly into said frame member opening with said clamping member side walls transversely inwardly of said frame member side walls and side wall flanges and with said clamping member downwardly on said frame member bottom wall and said clamping member top wall projecting above said frame member side wall flanges, said clamping member in said assembly configuration having at least one clamping member side wall spaced transversely of one of said frame member side walls and flange portion permitting edgewise insertion of a deformable sheet member transversely therebetween and into said frame member opening, said clamping member in deformed clamping configuration from a downward deforming force against said clamping member top wall having said clamping member

side walls clamped transversely along said frame member side walls and beneath and transversely inwardly along said frame member side wall flange portions to deform and clamp said sheet material transversely against said one frame member side wall and beneath and transversely along said flange portion of said one frame member side wall.

2. A frame construction as defined in claim 1 in which said clamping member is inverted generally U-shaped in cross-section.

3. A frame construction as defined in claim 1 in which said clamping member is annular in cross-section.

4. A frame construction as defined in claim 1 in which said clamping member is inverted generally U-shaped in cross-section having downward extremities of said clamping member side walls against said frame member bottom wall transversely straddling an upward projection longitudinally along said frame member bottom wall.

5. A frame construction as defined in claim 1 in which weakened portions are formed in said clamping member side walls generally transversely inwardly aligned with said frame member side wall flange portions.

6. A frame construction as defined in claim 1 in which said clamping member is inverted generally U-shaped in cross-section; and in which longitudinally spaced weakened portions are formed in said clamping member side walls generally transversely inwardly aligned with said frame member side wall flange portions.

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DAVID J. WILLIAMOWSKY, Primary Examiner

P. C. KANNAN, Assistant Examiner

U.S. Cl. X.R.

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