

- [54] **STORM WINDOW ASSEMBLY**
- [76] Inventor: **Jack N. Kelarakis**, 301 Royal Palm Blvd., Apt. 204, Charleston, S.C. 29407
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- [51] Int. Cl. **E06b 3/80**
- [58] Field of Search 160/179

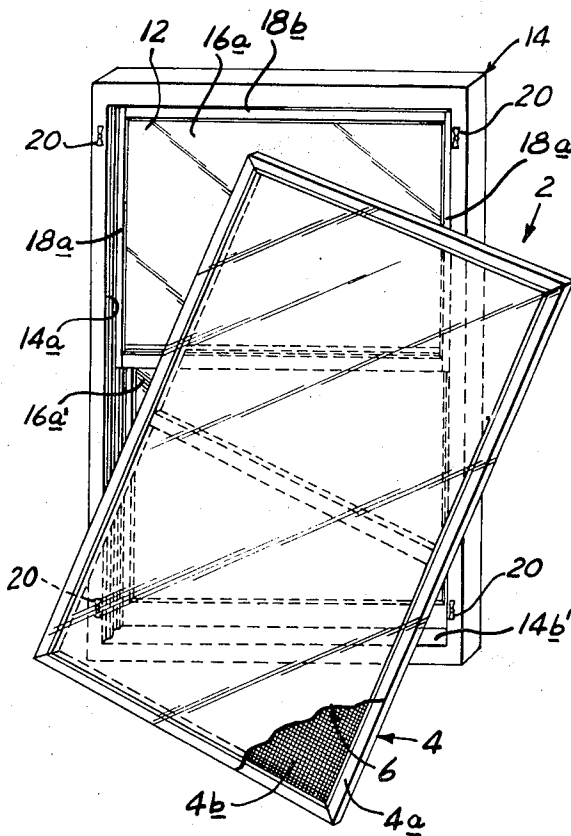
Primary Examiner—Kenneth Downey
 Attorney—Sidney Wallenstein et al.

[57] **ABSTRACT**

A storm window assembly is formed from a conventional window screen unit converted for winter use into a storm window assembly simply and easily by providing a rectangular, bag-like structure made of a flexible synthetic plastic material and enclosed on three sides and open on one side slidably to receive the screen unit. The bag-like structure is most advantageously made of a clear, transparent material, slightly longer than the screen unit so the open end portion thereof may be pulled tightly around the adjacent end of the screen unit within the bag and anchored in such tight condition by suitable anchoring means, like a strip of adhesive tape or the like.

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3 Claims, 6 Drawing Figures



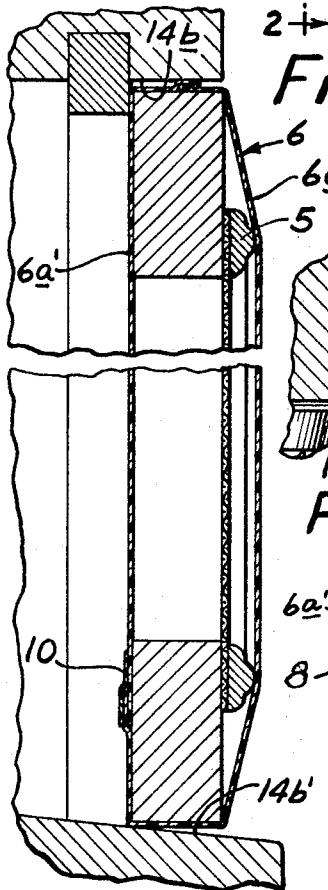
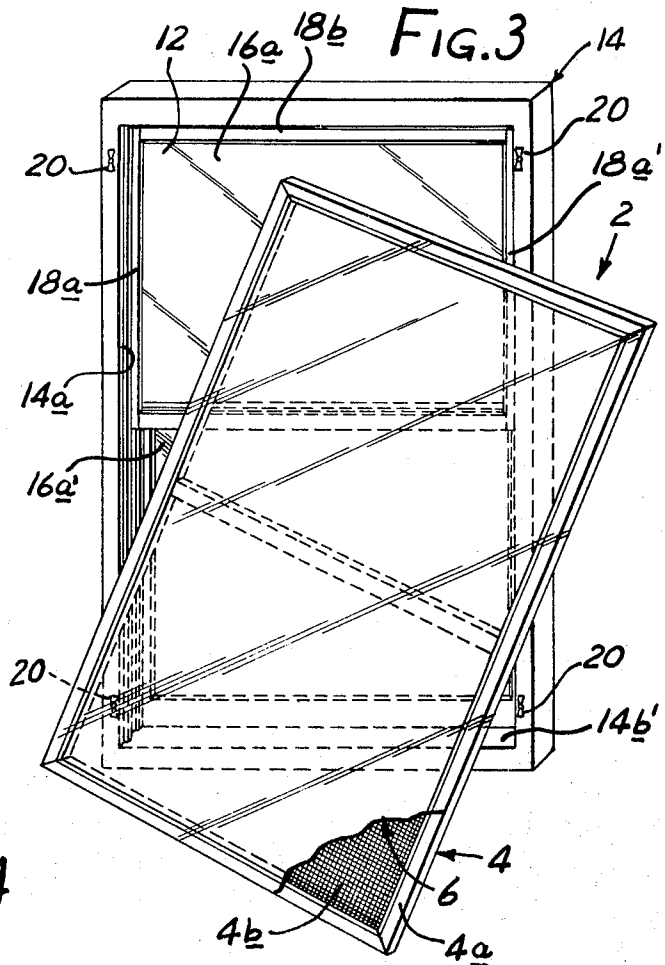
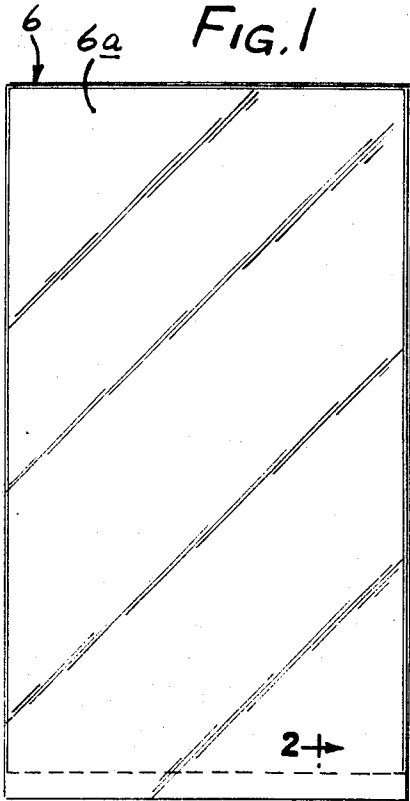


FIG. 4

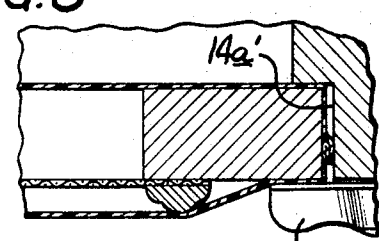
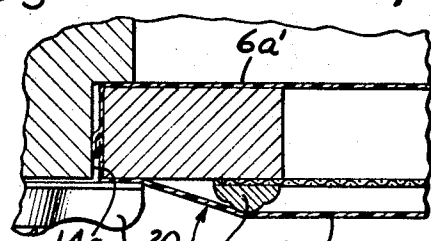
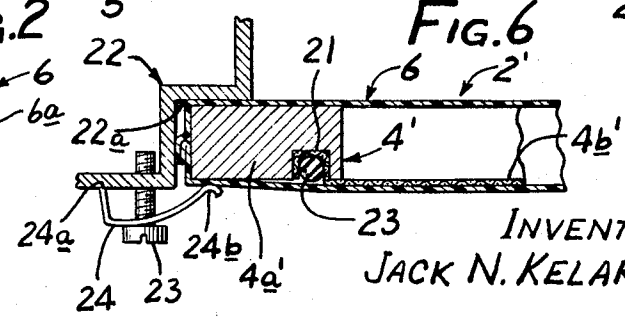


FIG. 2

FIG. 6



INVENTOR
JACK N. KELARAKIS

by: Wallenstein, Spangenberg, Hattis
& Strampfel
ATTYS.

STORM WINDOW ASSEMBLY

The present invention relates to storm windows and, most particularly, to the combination of storm window forming elements including a window screen unit which is usable as such in the warm and moderate months and synthetic plastic sheet material removably attachable to the screen unit to convert the same to a storm window during the cold months.

Most homes initially built without air conditioning utilize sets of window screens and storm window units which are interchangeable between the summer and winter months. Storm windows made of glass are relatively heavy and, therefore, difficult to install and remove. To eliminate the use of separate glass storm windows both to ease the burden of installing and removing the same and also to eliminate the cost of conventional storm windows, it has sometimes been the practice to nail or tack a sheet of synthetic plastic material over the outside of a window screen unit to prevent the passage of cold air through the window screen unit. In more sophisticated applications of this principle, specially designed frames for the window screen units are provided which includes means for removably receiving sheets of screen and plastic sheet material used together or interchangeably.

In all of these various arrangements of window screen units and synthetic plastic sheet material, the assembly of the synthetic plastic sheet material on or over the window screen units still requires a considerable effort on the part of the homeowner. Moreover, especially when a sheet of synthetic plastic sheet material merely is nailed or tacked or similarly applied over a window screen unit, the synthetic plastic sheet material can readily be seriously damaged by wind and rain and sometimes by moving objects like branches striking the same. For example, in those cases when a sheet of synthetic plastic sheet material is applied to the inside surface of the window screen unit, the force of the wind passing through the screen material readily vibrates the same to an extent which can tear the same. Where a sheet of synthetic plastic sheet material is nailed, tacked or similarly applied to only the outside of the window screen unit, even moderate winds can enter the small openings at the margins of the synthetic plastic sheet material to pull the same loose or tear the same, and wind blown particles and branches often strike and tear the synthetic plastic sheet material.

It is, accordingly, one of the objects to the invention to provide an improved storm window assembly comprising a screen unit which is usable alone during the summer months, and removable synthetic plastic sheet material applied to the screen material during the winter months in a manner such that the time and effort required to apply synthetic plastic sheet material to the screen unit is greatly reduced from that heretofore necessary.

Another object of the invention is to provide unique combination of a window screen unit and synthetic plastic sheet material which can withstand wind and rain forces to a much greater extent than the prior arrangements of window screen and synthetic plastic sheet material, without losing the capability of performing its intended function of a storm window during the winter months.

Another object of the invention is to provide a storm window assembly as above described which may include a conventional wood framed or aluminum

framed screen unit which need not be modified in any way to simplify and easily receive the synthetic plastic sheet material.

Since a screen unit is converted to a storm window unit by the application of a single sheet of synthetic plastic material to the inside or outside of a window screen unit, the addition of a secure sheet or layer of synthetic plastic sheet material on the opposite side of the window screen unit was probably not heretofore considered, since to do so would appear further to complicate the storm window assembly involved without any additional apparent advantage. However, in accordance with the applicant's invention, the use of closely confronting sheets of synthetic plastic material in the manner to be described overcomes all of the previous mentioned difficulties. Accordingly, applicant has conceived of the very simple and inexpensive concept of providing two closely spaced but confronting sheets of synthetic plastic material formed into a rectangular bag-like structure most advantageously and desirably having three closed sides and one side initially open for the full extent thereof, so that the window screen unit involved can be simply slid into the open end of the bag-like structure. The open end of the bag-like structure is provided with means for readily and easily closing the same so that the window screen unit is completely enclosed within synthetic plastic sheet material. In the most advantageous form of the invention, the bag-like structure is somewhat longer than the window screen unit so that the open end thereof, once the window screen unit has been slid within the bag-like structure, can be tightly folded over the adjacent end of the window screen unit where the folded over end terminates between the inner and outer margins of the frame portion of the window screen unit, so that the tightly folded over end of the bag-like structure can be held in this position by the application of a strip of adhesive tape pressed against the same, backed by the rigid frame of the window screen unit. The screen unit is then preferably mounted in place in a window frame so the adhesive tape is on the inside of the storm window assembly of the invention. The application of appreciable wind forces to the storm window unit cannot readily vibrate or tear the tightly held synthetic plastic sheet material encasing the screen unit since the wind has no access to any surface of the synthetic plastic sheet material not supported by a portion of the window screen unit. Moreover, of most importance is that the process of assembling the synthetic plastic sheet material to the window screen unit or removing the same therefrom is an exceedingly simple operation that even a child can easily perform in a matter of seconds. Additionally, even in the highly unlikely event that the outer most layer of the synthetic plastic sheet material of the bag-like structure is punctured, this would still not destroy the storm window imparting properties of the storm window assembly since the innermost still undamaged wall of the bag-like structure still performs the function of isolating the outside cold air from the space between the storm window assembly and the window involved while the assumed punctured outer wall thereof keeps the main force of the wind from the innermost wall.

A specific exemplary embodiment of the invention will now be described in conjunction with the drawings wherein:

FIG. 1 is a perspective view of the bag-like structure forming one of the elements of a storm window assembly of the invention;

FIG. 2 is a sectional view through the bag-like structure of FIG. 1;

FIG. 3 is a perspective view of a storm window assembly comprising the bag-like structure shown in FIG. 1 encasing a conventional window screen unit of the type having a wooden frame, the storm window assembly being shown in a position to be placed in a window frame;

FIG. 4 is a fragmentary vertical sectional view through the assembly of the storm window assembly mounted in the window frame shown in FIG. 3;

FIG. 5 is a fragmentary horizontal sectional view of the storm window assembly mounted in the window frame shown in FIG. 4; and

FIG. 6 is a fragmentary horizontal sectional view through a storm window assembly of the invention comprising a conventional type aluminum window screen unit and a synthetic plastic bag-like structure enclosing the screen unit, the storm window assembly being mounted within an aluminum window frame.

Refer now more particularly to FIG. 2 which illustrates a storm window assembly 2 which is constructed in accordance with the present invention. This storm window assembly includes a more or less conventional window screen unit 4 having a rectangular wooden frame 4a whose inner margins define a rectangular opening covered by the metal screen 4b of a mesh size to permit the ready passage of air but to prevent the passage of insects is conventional, the sheet of window screen material 4b is held in place against the wooden frame 4a by suitable nailed or tacked moldings 5 best shown in FIGS. 4 and 5. The window screen unit 4 is covered on both sides by a body 6 made most advantageously of a flexible clear transparent synthetic plastic material, like polyvinyl chloride, polyethylene, or the like. The body 6 of synthetic plastic sheet material is a bag-like structure which, before being applied to the window screen unit 4, has the construction best shown in FIG. 1.

The bag-like structure 6 comprises closely spaced confronting rectangular walls 6a-6a' which are heat sealed or otherwise preferably secured together along two longitudinal or side margins thereof and along one of the short or end margins thereof to form a bag-like structure open along the entire other side or end margin thereof to form an opening 8 (FIG. 2) thereat extending for the full width of the bag-like structure. The width of the opening 8 is slightly greater than the width of the window screen unit 4, which can be readily slid within the bag-like structure through the opening 8. When the window screen unit 4 is within the bag-like structure 6, the fit is preferably sufficiently tight so that the confronting walls 6a-6a' form smooth surfaced, taut walls through which one can see with little or no distortion. In accordance with the broadest aspect of the invention, the bag-like structure 6 could be made of a non-transparent synthetic plastic sheet material, but a clear transparent material is clearly preferred.

One of the walls 6a' of the bag-like structure 6 most advantageously is shorter than the window screen unit in the direction of the open end thereof and terminates between the inner and outer margins of the adjacent portion of the frame 4a of the window screen unit. The other wall 6a of the bag-like structure 6 is longer in the

direction of the open end thereof than the corresponding dimension of the window screen unit 4 so that, when the window screen unit has been fully inserted within the bag-like structure, the walls 6a can be pulled tightly around the adjacent end of the window screen unit 4 and brought to a position along the opposite side of the window frame unit where it overlaps the end of the short wall 6a' and terminates at a point between the inner and outer margins of the adjacent portion of the frame 4a of the window screen unit (see FIG. 4). The folded over end of the wall 6a is then anchored in place while it is maintained in a tight position around the end of the window screen unit 4 preferably by a strip 10 of adhesive tape or the like. Because of the location of the end margin of the folded over wall 6a at a point between the inner and outer margins of the frame of the window screen unit, the frame acts as a convenient rigid backing to apply the adhesive tape. The adhesive tape 10 is of a conventional type having a pressure sensitive adhesive on the inner side thereof which permits the adhesive tape to be removed cleanly from the walls 6a and 6a' of the bag-like structure when it is desired to open the bag-like structure and remove the window screen unit 4 therefrom.

The storm window assembly 2 is adapted to fit within a window frame opening 12 defined by the inwardly facing surfaces 14a-14a' and 14b-14b' of the window frame generally indicated by reference numeral 14. Conventional movable window units 16a and 16a' shown in FIG. 3 form an inner closure for the window frame opening 12, as is conventional. The window frame 14 also, most advantageously, presents outwardly horizontally facing side window frame surfaces 18a-18a' and a top outwardly horizontally facing surface 18b. The inwardly facing bottom surface 14b' of the window frame opening is shown as a slightly downwardly and outwardly inclining surface. The storm window assembly 2 fits within the window frame opening 12 in a manner which enables the storm window assembly to be easily positioned within the opening 12 with the peripheral portions of the storm window assembly abutting against the outwardly horizontally facing surfaces 18a-18a', 18b and the inner portions of the inclined bottom surface 14b', as best shown in FIGS. 4 and 5.

When the storm window assembly 2 has been fully mounted within the window frame opening 12, conventional winged storm window retaining units 20 located at the top and bottom of each of the side margins of the window frame 14 are pivoted from a position shown in FIG. 3 outside of the margins of the window frame opening 12 into the position shown in FIG. 5 where they preferably bear against the outer surfaces of the window screen unit frame 4a through the bag-like structure 6, to press the storm window assembly firmly against the window frame surfaces 18a-18a', 18b and 14b'. The synthetic plastic sheet material of the bag-like structure 6 directly engages the latter surfaces where an air tight seal will usually be formed between the storm window assembly and the window frame.

The present invention is applicable to window screen units of all types, including the conventional aluminum window screen unit 4' shown in FIG. 6. The aluminum window screen unit 4' thus includes a conventional aluminum frame 4a' with its central opening covered by a sheet of screen material 4b' which extends within a channel 21 in the frame 4a' where it is held in place by

any suitable retaining means 23. The aluminum window screen unit 4' is encased within the aforementioned bag-like structure 6 to form a storm window assembly 2' in the same manner as described in connection with the embodiment of the invention shown in FIGS. 1 through 5. FIG. 6 illustrates an aluminum window frame 22 presenting outwardly horizontally extending surfaces like the surface 22a against which the storm window assembly 2' bears. The storm window assembly 2' is pressed against the aforementioned outwardly horizontally extending surfaces of the window frame 22 by suitable storm window assembly retaining means, such as by a spring member carrying screw 23. Each screw 23 has a threaded shank portion threading into the aluminum window frame and freely passing through an opening in a spring member 24 having one end 24a bearing on the window frame and a free end 24b bearing against the marginal portion of the storm window assembly. By adjusting the screw 23, the head portion of the screw presses the free end 24b of the spring member 24 against the storm window assembly 2' to press the same firmly within the window frame opening.

After the winter months are over, the storm window assembly 2 or 2' can be readily disassembled by removing the adhesive tape 10 from the bag-like structure 6, thereby exposing the opening 8 into the bag-like structure 6, to permit the easy removal of the window screen unit 4 or 4' therefrom, which is then replaced within the associated window frame opening.

It should be understood that the present invention thus provides an exceedingly simple and inexpensive means for providing window screens and storm windows for a home, and greatly reduces the effort necessary to convert from window screens to storm windows and vice versa.

It should be understood that numerous modifications may be made in the most preferred forms of the invention described above and shown in the drawings without deviating from the broader aspects of the invention.

I claim:

1. A storm window assembly comprising: a rectangular window screen unit including a frame having an opening covered by screen material which is permeable to air and impermeable to most insects, the screen unit being fittable into a window frame opening; and said window screen unit being encased in a rectangular bag-like structure including closely spaced walls of synthetic plastic sheet material impermeable to the passage of air and positioned on opposite sides of the window screen unit, said confronting walls of the bag-like structure being permanently sealed along the three of the margins thereof and initially open along substantially the entire extent of the fourth margin thereof so the window screen unit can readily be slid into the bag-like structure through the open end thereof, the bag-like structure having a length in the direction of said fourth margin thereof which is greater than the corresponding dimension of the window screen unit, and said fourth margin of the bag-like structure being folded over the adjacent end of the window screen unit where it extends around to the opposite side of the storm window assembly and terminates at a point between the inner and outer margins of the window screen unit frame, and adhesive tape anchoring said folded over end of said bag-like structure extending along the adjacent surfaces of the folded over end of

the bag-like structure and the adjacent wall of the bag-like structure positioned over the window screen unit frame which acts as a backing support for the application of the adhesive tape.

2. A storm window assembly comprising: a rectangular window screen unit including a frame having an opening covered by screen material which is permeable to air and impermeable to most insects, the screen unit being fittable into a window frame opening; and said window screen unit being encased in a rectangular bag-like structure including closely spaced walls of synthetic plastic sheet material impermeable to the passage of air and positioned on opposite sides of the window screen unit, said confronting walls of the bag-like structure being permanently sealed along three of the margins thereof and initially open along substantially the entire extent of the fourth margin thereof so the window screen unit can readily be slid into the bag-like structure through the open end thereof, the bag-like structure having a length in the direction of said fourth margin thereof which is greater than the corresponding dimension of the window screen unit, one of the confronting walls of said bag-like structure being longer than the corresponding dimension of the window frame unit in the direction of the initially open end of the bag-like structure and the other confronting wall is shorter than the same, the longer confronting wall of the bag-like structure being folded around the adjacent end of the window screen unit to overlap the end of and being anchored to the shorter confronting wall thereof.

3. A storm window assembly comprising: a rectangular window screen unit including a frame having an opening covered by screen material which is permeable to air and impermeable to most insects, the screen unit being fittable into a window frame opening; and said window screen unit being encased in a rectangular bag-like structure including closely spaced walls of synthetic plastic sheet material impermeable to the passage of air and positioned on opposite sides of the window screen unit, said confronting walls of the bag-like structure being permanently sealed along three of the margins thereof and initially open along substantially the entire extent of the fourth margin thereof so the window screen unit can readily be slid into the bag-like structure through the open end thereof, the bag-like structure having a length in the direction of said fourth margin thereof which is greater than the corresponding dimension of the window screen unit, one of the confronting walls of said bag-like structure being longer than the corresponding dimension of the window frame unit in the direction of the initially open end of the bag-like structure and the other confronting wall is shorter than the same, the longer confronting wall of the bag-like structure being folded around the adjacent end of the window screen unit to overlap the end of and being anchored to, the shorter confronting wall thereof and terminates at a point between the inner and outer margins of the adjacent portion of the frame of the window screen unit, adhesive tape anchoring said folded over end of said bag-like structure, the adhesive tape overlying the adjacent surfaces of the folded over end of the longer confronting wall of the bag-like structure and the shorter wall thereof positioned over the window screen unit frame which acts as a backing support for the application of the adhesive tape.

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