Jan. 13, 1970 C. O. WEIKEL ETAL 3,489,199

SCREEN OR STORM DOOR OR COMBINATION THEREOF

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FIG. 1

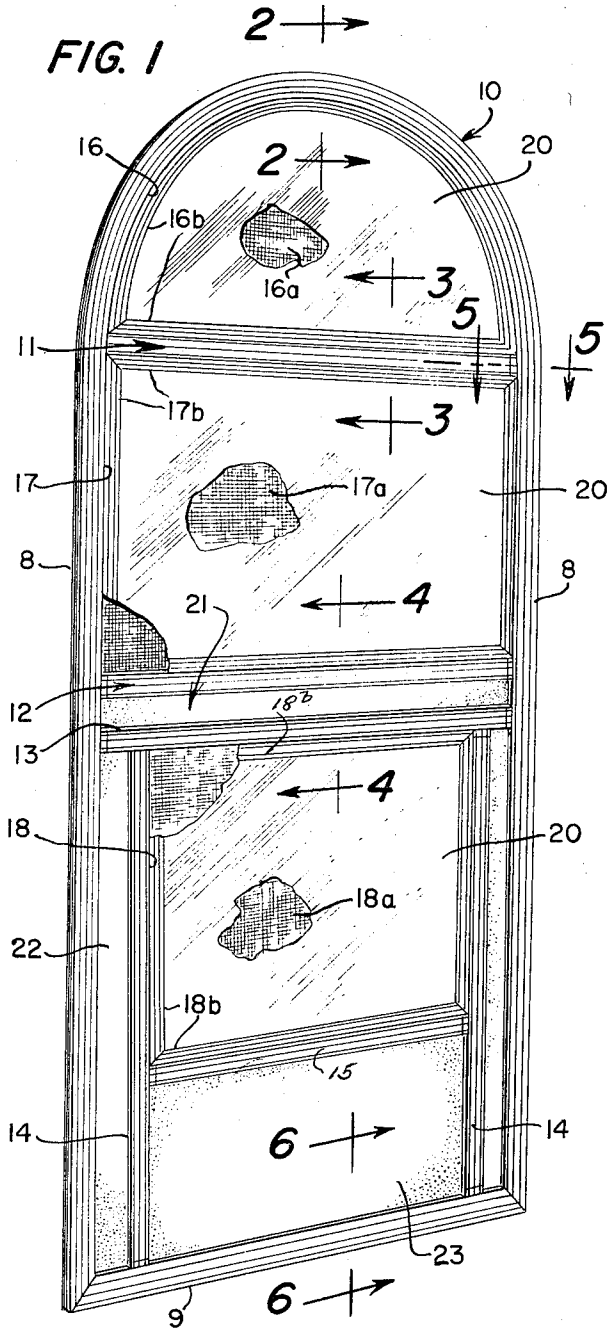


FIG. 2

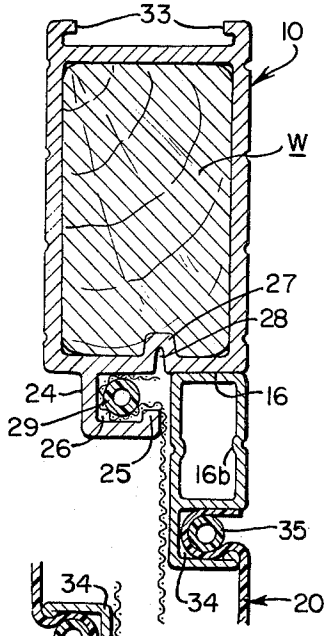
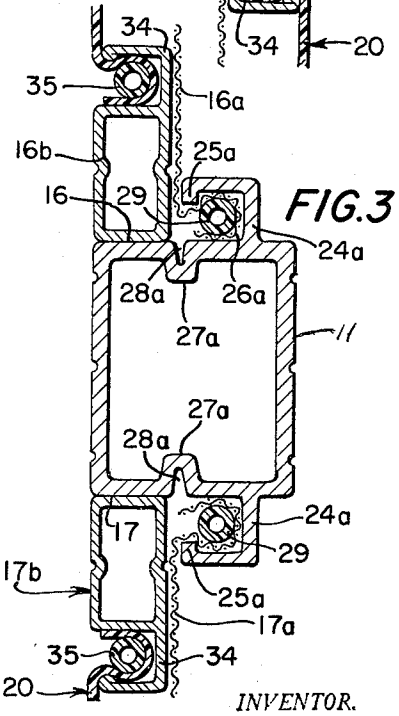


FIG. 3



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FIG. 5

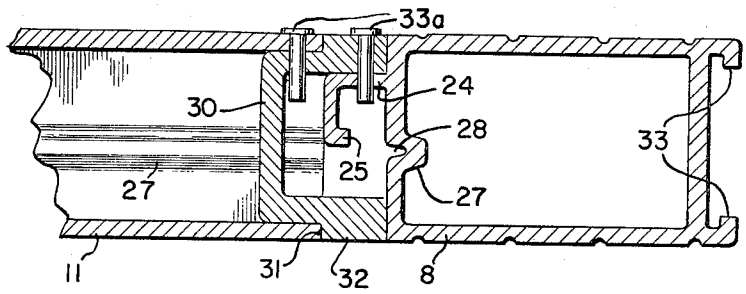


FIG. 4

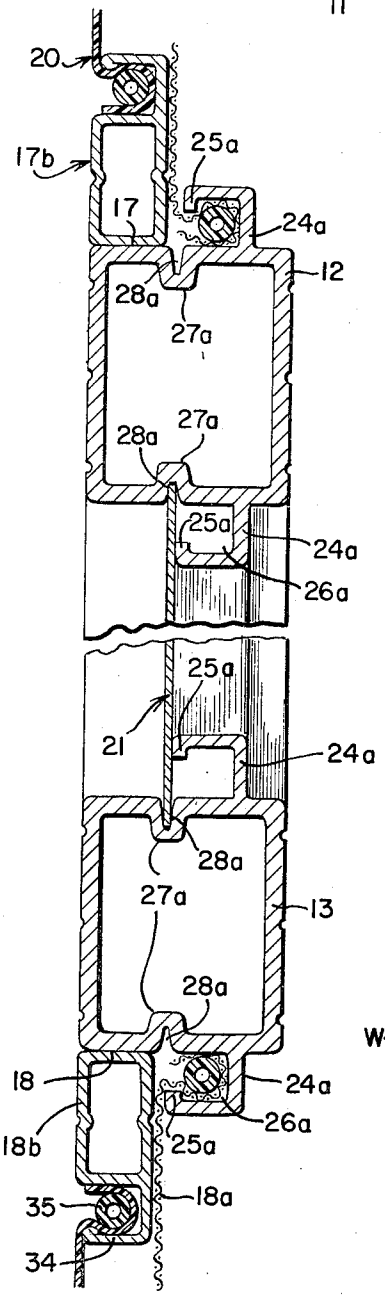
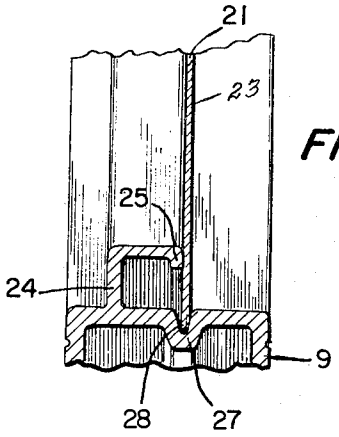


FIG. 6



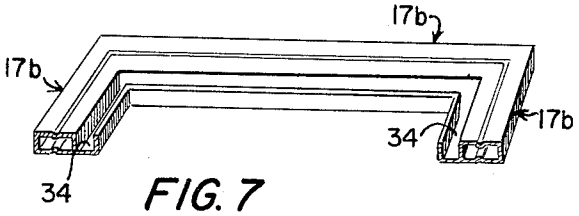


FIG. 7

FIG. 8

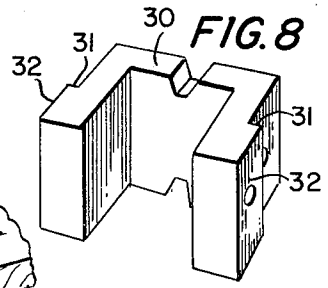
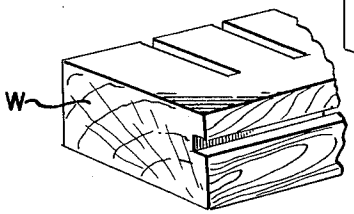


FIG. 9



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SCREEN OR STORM DOOR OR COMBINATION THEREOF

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Int. Cl. E06b 3/12, 3/72, 3/80
U.S. Cl. 160—90 3 Claims

ABSTRACT OF THE DISCLOSURE

A screen or storm door or combination thereof which has removable weather-excluding material frames and permanent scarproof panels. Elements of the door frame cooperate to provide frontal inset spaces to seat the removable frames. The scarproof panels being seated in part by the door frame spaces and in part by additional permanent door carried frame members.

SUMMARY OF THE INVENTION

Our invention relates to a screen or storm door and has particular reference to a convertible screen and storm door.

The invention relates to a screen or storm door or combination that includes a plurality of removable weather-excluding material frames which are seated in the door frame inset spaces and overlie a plurality of screened areas. Scar-proof plates included a push plate, dog scratch plates and a kick plate are secured to the side frame portions of the door frame. Novel connection means secures the frames and the plates to the door frame.

OBJECTS STATED

Briefly stated, the invention contemplates firstly the provision of readily applicable and removable weather-excluding material-carrying frames for each of a plurality of door-provided screened areas. The said "weather" frames can be readily stored when not in use which is not the case when a single whole door-covering weather-excluding material-carrying frame is used.

A further object of the invention is to provide a screen door or a storm door (or a combined screen and storm door) which incorporates, as what amounts to frame elements, substantially scar-proof imperforate plates at areas which are subject to the greatest wear in service such as the lower end and lower side portions where dogs scratch or people resort to a shod foot for door manipulation; and further to the door mid-portion which is subjected to hand pushes.

A door which incorporates the aforementioned plates will obviously be long lived and can always present a neat and attractive appearance.

Another object is to incorporate a reinforcing wood filler in one or more areas of tubiform metal door frame; and further, to anchor same in plate by a frame-provided rib which also provides a seating groove for the plates mentioned in the preceding paragraph.

A still further object is to provide novel door frame-provided securing means for the screening and for the weather-excluding plastic sheets of the aforementioned removable insert frames; and wherein frame-provided channels, which are part of the screen-securing means act as stops for limiting insertion of the respective carrier frames for weather-excluding material.

Invention also resides in various novel features of construction, combination and arrangement of the various parts to be hereinafter described and claimed.

Although a now preferred example of the invention has been disclosed, it is to be understood that the invention is susceptible of other mechanical expressions within the spirit and scope of the subject matter claimed hereinafter.

In the drawings, wherein the same reference characters have been used to designate the same parts throughout the several views—

FIG. 1 is a perspective view of a door embodying our invention, certain parts being broken away;

FIG. 2 is a sectional view taken on the line **2—2** of FIG. 1;

FIG. 3 is a section taken on the line **3—3** of FIG. 1;

FIG. 4 is a section taken on the line **4—4** of FIG. 1;

FIG. 5 is a sectional detail taken on the line **5—5** of FIG. 1 and showing the means for connecting a cross member to one of the outer side frame portions;

FIG. 6 is a section on line **6—6** of FIG. 1;

FIG. 7 is a fragmentary perspective of one of the weather-excluding material carrying frames;

FIG. 8 is a perspective of one of the cross member and main frame side connectors shown in FIG. 5; and

FIG. 9 is a fragmentary perspective of a wooden filler element shown in FIG. 2.

Referring to the drawings by reference characters, the functionally integral outer frame of the door is preferably rectangularly tubiform in cross-section throughout and comprises the door side portions **8**, bottom **9**, and arched top portion **10**—which latter, as shown in FIG. 2, has the wood filler W to resist deformation in service.

The other door frame elements are also preferably rectangularly tubiform in cross-section, and they include an upper cross member **11**; two rather closely spaced subjacent cross members **12, 13**, all carried by side frame portions **8**; members **14** spacedly paralleling the respective side frame portion **8** and connected to each of cross member **13** and bottom frame portion **9**; and a cross member **15** carried by the aforementioned longitudinally extending members **14**.

FIG. 1 shows that the arched upper frame portion **10** and upper cross members **11** define the space **16** which is screened (**16***a*) and, for winter service, is adapted to receive the fibre glass (**20**) carrying frame **16***b*. Similarly side frame portions **8** and cross members **11** and **12** define the screened (**17***a*) rectangular space **17** for a second fibre glass (**20**) carrying frame **17***b*; and finally frame members **13, 14** and **15** define the screened (**18***a*) space **18** for the fibre glass (**20**) carrying frame **18***b*.

Each of the frames **16***b*, **17***b*, and **18***b* is frictionally retained in place for ready removal; and of course any preferred weather excluding material can be substituted for the fibre glass **20**. But such material will preferably (but not necessarily) be flexible.

Rigid permanently installed plates **21, 22, 22** and **23** of scar-proof metal or other material complete the door structure with the side and end edges of said plates seated in the opposed frame rib-provided grooves **28, 28***a* of the inwardly extending ribs **27, 27***a* of the outer main door frame and other frame elements, respectively.

Thus, plate **21** which is bounded by side frame portions **8, 8** and cross members **12, 13**, is a hand engaging "push" plate for use when opening or closing the door; and the two side plates **22, 22** are "scratch" plates for dog use when wanting to get in or out, they being bounded by cross member **13**, bottom frame portion **9**, and the

adjacent one of the longitudinally extending members **14**.

Then finally, there is the "kick" plate **23** for use when it is desired to use a foot to open the door, as when carrying bundles, it being bounded by bottom frame portion **9**, side members **14, 14**, and the cross member **15**, as shown.

In carrying out the invention, the interior surface of the endless outer frame **8, 9, 10** has, adjacent the inner door surface, the coextensive substantially L-form flange **24** whose free foot portion edge is reverted (**25**) to provide the outer wall of a shallow screen-edge-receiving channel **26**, it being noted that screen securing wedging strips **29** are used. In addition, said inner wall of the outer door frame **8, 9** and **10** also has the central endless inwardly indented reinforcing rib **27** which provides the endless outwardly open groove **28** for receiving edge portions of the aforementioned imperforate plates **21, 22** and **23**.

Since the cross members **11, 12, 13** and **15**; and the outer frame paralleling members **14** are of identical cross-section L-flanges, ribs and grooves provided by same bear identical reference characters.

Thus, each of the aforementioned members **11, 12, 13, 14** and **15** have at two opposite sides the coextensive and substantially cross-sectionally L-form flanges **24***a* with reverted free foot edge portions **25***a* which provide the outer wall of the shallow screen edge-receiving channel **26***a*, which correspond to **24, 25, 26** of outer door frame **8, 9, 10**. Screen-securing wedging strips **29** are received in channels **26***a*.

Likewise the longitudinally coextensive inwardly indented reinforcing outer frame ribs **27***a* and related plate-receiving grooves **28***a* of members **11, 12, 13, 14** and **15** correspond to **27, 28** of outer door frame **8, 9, 10**.

Referring to FIGS. 2, 3, 4 and 7, it will be understood that endless elastic wedging strips secure edge portions of the weather-excluding sheets **20** in the endless channels **34** of the storm frames **16***b*, **17***b*, **18***b*—of which **17***b*, only, is shown in FIG. 7.

Referring now to the stiff scar-proof imperforate plates **21, 22** and **23** of FIG. 1, it will be understood that the ends of the "push" plate **21** are received in the opposed grooves **28** of side frame portions **8**; and its longitudinal edges in the cross member **12** and **13** provided grooves **28***a*.

As to the two "dog scratch plate" **22**, it will be apparent that the upper and lower edges are anchored in the respective grooves **28***a* of cross member **13** and **28** of bottom outer frame portion **9**; and the outer and inner plate (**22**) edges in the outer frame groove **28** and the opposed groove **28***a* of the related member **14**.

Grooves **28***a* of members **14, 15** and groove **28** receive the related edges of the "kick plate" **23** at the lower end of the door, as will be understood from FIG. 1.

At this point it is emphasized that, as to each of the outer frame **8, 9, 10** and the members **11, 12, 13, 14** and **15**, the outer faces of the channel wall-providing terminals **25** (or **25***a*) of the free foot portions of L-flanges **24** (or **24***a*) are substantially co-planar with the inner wall of the related groove **29** (or **28***a*) so as to engage and sustain the edge-adjacent areas of the related plate **21, 22** or **23**, as indicated in FIG. 4.

Although the ends of the member **11, 12, 13, 14** and **15** may be connected to related door frame members by any preferred means, that which is preferred is shown in FIG. 5. Thus, one end of cross member **11** is connected to the outer door frame side portion by connector member **30** which is seated in the end of 11 and secured in place by pin means **33***a*. Shoulder **31** of **30** engages the adjacent end of 11; and the thickened end **32** of **30** abuts side frame portion **8** at opposite sides of flange **24**; and other pins **33***a* extending through **24** complete the connection.

Endless side flanges **33** at the outer edge of outer door frame **8, 9, 10** are for stiffening purposes.

From the foregoing description, it is believed that the structural concept and advantage of our invention will be clear to those versed in the art.

Having thus described our invention, what we claim is:

1. In a screen door having inner and outer faces and comprising a frame which includes an endless functionally integral outer frame providing top, bottom, and side portions, a transversely extending rigid and substantially scar-proof push plate, vertically spaced door frame-included cross members for the upper door area and connected to said side frame portions and cooperating with the latter and with at least the top frame portion to provide major screen sheet-receiving recesses, screen sheets in the respective recesses and of a size and shape to fit in the latter, the improvement which comprises coplanar flanges extending into said recesses from said side frame portions and cross members, said flanges being inset from the plane of the outer door face, means securing the respective screen sheets to said inset flanges, weather-excluding material-carrying frames conforming to the shape of the respective major recesses and removably received in the latter from the outer door face with said inset flanges constituting stop means to limit inward movement of said frames, separate means connecting the ends of said push plate to the side frame portions and its upper edge to the bottom portion of the lowermost one of said screen-supporting cross members, a further door frame-provided cross member engaging and supporting the lower edge of said push plate and connected at its ends to the side frame portions, vertical bars as elements in said door frame and spaced inwardly of each side frame portion, means connecting the ends of said bars to the push plate-supporting cross bar and bottom outer frame portion, a rigid and substantially scar-proof dog scratch plate incorporated in said door frame adjacent each lower side portion thereof, said scratch plate having side edges secured to adjacent side frame and bar portions and their respective ends to the push plate-supporting bar and bottom outer frame portion, a minor cross member incorporated in said door frame, means connecting said minor cross member to said vertical bars between the bottom frame portion and the push plate-supporting cross bar, whereby to provide upper and lower minor recesses between said vertical bars; coplanar flanges inset from the outer door face and extending into each of said minor recesses from adjacent frame-provided portions, screening secured to the inset flange of the upper recess, a frame-reinforcing kick plate of substantially scar-proof material in said lower recess, means securing said kick plate to the bottom outer frame portion, and to the adjacent bars and minor cross member, the inset flange of said lower recess providing a supporting stop for said kick plate, and a weather-excluding material-carrying frame frictionally and removably secured in the upper one of said minor recesses and insertible thereinto from the outer face of the door.

2. The structure of claim **1**, and the outer door frame and cross bars being of metal which is tubiform in cross-section, the screen-supporting flanges at the inner surface of said outer door frame being coextensive with the latter and having laterally turned channel wall-defining free edges, coextensive inwardly indented reinforcing ribs at the inner surface of said outer door frame and providing coextensive surface grooves facing said frame-provided recesses, each of said cross members and bars having duplications of the aforementioned flanges, ribs and rib-provided grooves at each recess-facing side thereof and all of the latter being coplanar with their outer door frame-provided counterparts, the edges of the aforementioned push, scratch and kick plates being seated in the related opposed rib-provided grooves, whereby the latter constitute the means for securing said plates to the door frame, and the inturned channel-defining free edge walls of said frame portion-provided flanges constituting opposed sustaining abutments for said plates.

3. The structure of claim **2**, and projecting fittings secured in the ends of each of said cross bars and posts and

secured to the related opposed frame portion-provided flanges.

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U.S. Cl. X.R.

52—456