Feb. 12, 1963 F. MAKARA 3,077,050

CONTINUOUS INSECT FILM

Filed May 26, 1961

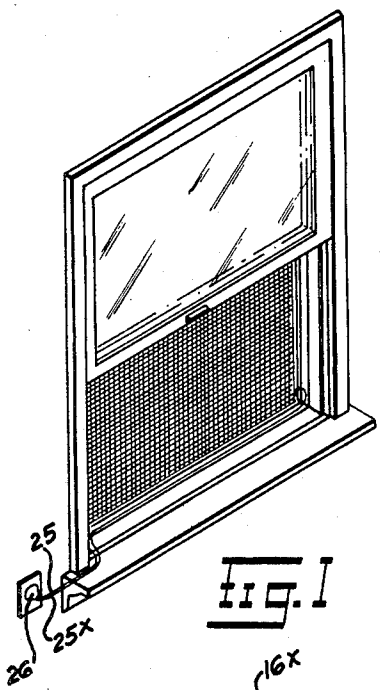


Fig. 1

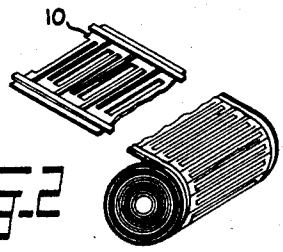


Fig. 2

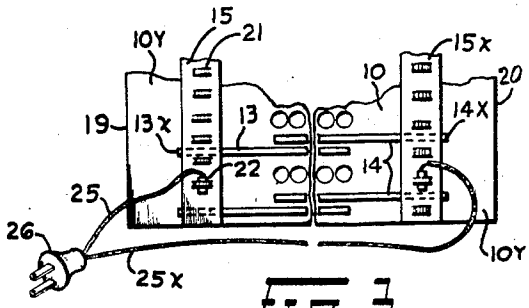


Fig. 3

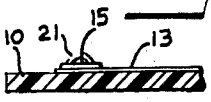


Fig. 4

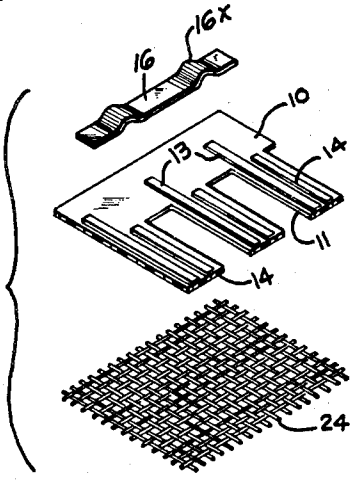


Fig. 5

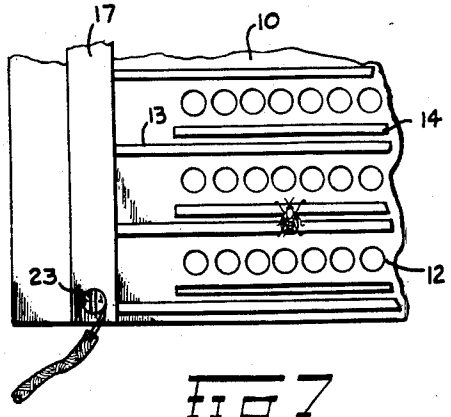


Fig 7

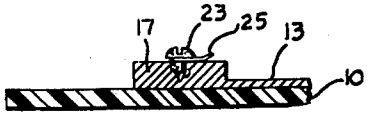


Fig. 6

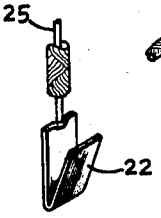


Fig. 8

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CONTINUOUS INSECT FILM

Frank Makara, 29 Orange Drive, Jericho, N.Y.

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1 Claim. (Cl. 43—112)

This invention relates to a combined ventilation and electrical screen.

It is an object of this invention to provide a plastic flexible ventilation screen used also as an insect killer.

It is a further object to provide a rollable continuous screen so that it may be selectively cut-off and sold as yard goods.

It is another object to provide an electrical screen which is used as an insect killing screen while acting as a ventilation screen.

These and other objects of this invention will become apparent upon reading the following descriptive disclosure taken in connection with the accompanying drawing in which:

FIG. 1 is a perspective view of an open window having the screen adhesively secured to the respective edges of the window framework.

FIG. 2 is a schematic simplified view of a continuous plastic sheet having transverse slots therein and rolled up with the free end pulled out and broken away, showing the plastic screen construction as having printed electrical spaced-apart conduits thereon,

FIG. 3 is a view of a portion of a perforated plastic modified screen having spaced-apart transverse printed metal strips thereon, said screen being provided with a pair of metal side or longitudinal conduits at its edges engaging electrically said printed metal strips in alternate relationship, said side conduits being adapted to engage electrical connectors,

FIG. 4 is an end view of a portion of the screen of FIG. 3,

FIG. 5 is an exploded view of a modified three component screen having a plastic backing woven screen, a plastic perforated sheet having suitable metal printed spaced-apart conduits thereon and an undulating border foil conduit secured to said metal printed conduits of said plastic sheet,

FIG. 6 is an end view of the screen of FIG. 2 showing the manner of effecting electrical hook-up to the leads thereon,

FIG. 7 is a partial front view of the plastic screen of FIG. 2 modified to show the use of a plurality of small apertures in lieu of small slots, and

FIG. 8 is a perspective view of an electrical connector used to engage the border conduits of the screens of FIGS. 3 and 4.

This invention consists essentially of a thin rollable continuous electrical insulation plastic sheet **10** made from, for example, polyethylene, or any conventional flexible plastic material, such as rubber, synthetic rubber, cellophane and the like.

The continuous plastic sheet is preferably perforated with a plurality of selective apertures, slots **11** or circles **12**, for purposes of atmospheric ventilation and of a size not to permit passage of insects.

The plastic sheet **10** is provided with metal printed transverse conduits **13** and **14** made from suitable paint having for example, aluminum or brass particles or alloys. The conduits **13** and **14** are continuously printed upon a continuously moving plastic sheet **10**. The mode of printing may be suitable metal paints having a suitable volatile thinner, for example, acetone therein. The printed strip after heat drying to remove volatiles may be subjected to further heat treatment, for example, by infrared lamps, to fuse the metal particles into a homogeneous mass without deleteriously effecting the plastic sheet **10**.

Alternatively a suitable low melting point molten alloy containing stainless steel printing roller adapted to receive said molten metal alloy in the roller grooves thereof and transfer the metal in a semi-cooled state to a continuously moving plastic sheet **10** in contact with the alloy containing roller.

The printed conduits may be only the transverse spaced-apart conduits **13** and **14** to which flexible metal foil border strips **15** and **15X** are then fused (FIG. 3), or as shown in FIGS. 2 and 6, the border strip **17** may be of thicker dimensions printed upon the plastic sheet **10** simultaneously with the respective transverse conduits **13** and **14** using the same printing composition.

As shown in FIG. 3, the transverse conduits **13** and **14** are parallel but suitably spaced-apart. The conduits **13** extend leftwardly close to the longitudinal edge **19** of sheet **10** whereas the conduits **14** extend toward the longitudinal edge **20** of the plastic sheet **10**.

Also as shown in FIG. 3, border conduits **15** and **15X** of suitable flexible metal foil, for example, brass or aluminum, is contactingly united to all the transverse conduits **13** and **14** adjacent their exterior ends **13X** and **14X** respectively. The metal foils **15** and **15X** are secured to the conduits **13** and **14** by the use of suitable solder or by spot welding.

The longitudinal metal strips **15** and **15X** preferably of foil, are provided with expanded prong-receiving curved slots **21** by dome shaping the conduits. Prongs **22** (FIG. 8) having a V-shaped configuration and preferably made of brass are inserted in the slots **21** to effect a firm seizure of a prong **22** therein.

In the modification of FIG. 6 wherein relatively thick border conduit **17** is printed upon the sheet **10**, suitable metal screws **23** for securing electrical wires may be employed.

An electrical wire **25** when secured to a screw **23** or spring clip **22** to conduit **15** leads to a conventional plug **26**. A second electrical wire **25X** leads to the other screen conduit **15X** (FIGS. 1 and 3).

The plug **26** is disposed in an electrical circuit of suitable voltage, for example, 10 volts or less, or to a transformer outlet, transforming the conventional 110 volt household circuit into a circuit of the desired voltage.

As shown in FIG. 5, a three component screen may be used, and is prepared from perforated plastic sheet **10** having lateral printed conduits **13** and **14** thereon. A longitudinal modified metal foil conduit **16** having a plurality of spaced-apart elevated linearly disposed domes **16X** is united to the respective free ends of each of the lateral conduits **13** and **14** respectively. The foil conduits **16** are made integral with the respective lateral conduits **13** and **14** by means of spot welding.

In the modification of FIG. 5, the plastic sheet **10** is made from thermoplastic resin and the plastic screen **24** is made from a suitable or identical thermoplastic resin. In this event, the heat fusion of sheet **10** to screen **24** may be effected simultaneously with the heat fusion of foil **16** to the conduits **13** and **14**. The use of a tightly woven screen **24** permits large slots **11** and functions as a barrier against even the smallest insects.

The manufactured screen, being flexible is shipped as a tightly rolled-up unit. The consumer purchases as great a length of the roll as he desires to fit his window or door and this amount is cut from the free of the roll.

The plastic screen is provided with longitudinal border areas **10Y** suitable for receiving tacks for securing the plastic screen to a wooden window frame.

This invention includes the concept of adheringly disposing the transverse conduits **13** and **14** and the respective longitudinal conduits united thereto upon a plastic pliable or resilient screen **24**.

This invention is illustrated herein by a plurality of

embodiments, but it is not limited to these embodiments but only to the claim herein.

I claim:

As an article of manufacture, a rollable combination ventilation and electrical screen adapted to killing insects comprising a thin continuous longitudinal plastic film having a plurality of suitably spaced-apart transverse rows of suitable small apertures; a longitudinal continuous metal electrical conduit printed upon and disposed adjacent each longitudinal edge of said film; a plurality of first metal electrical transverse conduit printed integrally with one of said longitudinal conduits and extending suitably toward the other longitudinal conduit between respective transverse rows of apertures; a second plurality of metal electric transverse conduit printed integrally with the other of said longitudinal conduits suitably close to said first transverse conduit between each respective row of apertures and extending toward said first longitudinal conduit and wire attachment means for securing each of said longitudinal metal printed conduits to a conventional source of electrical current.

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