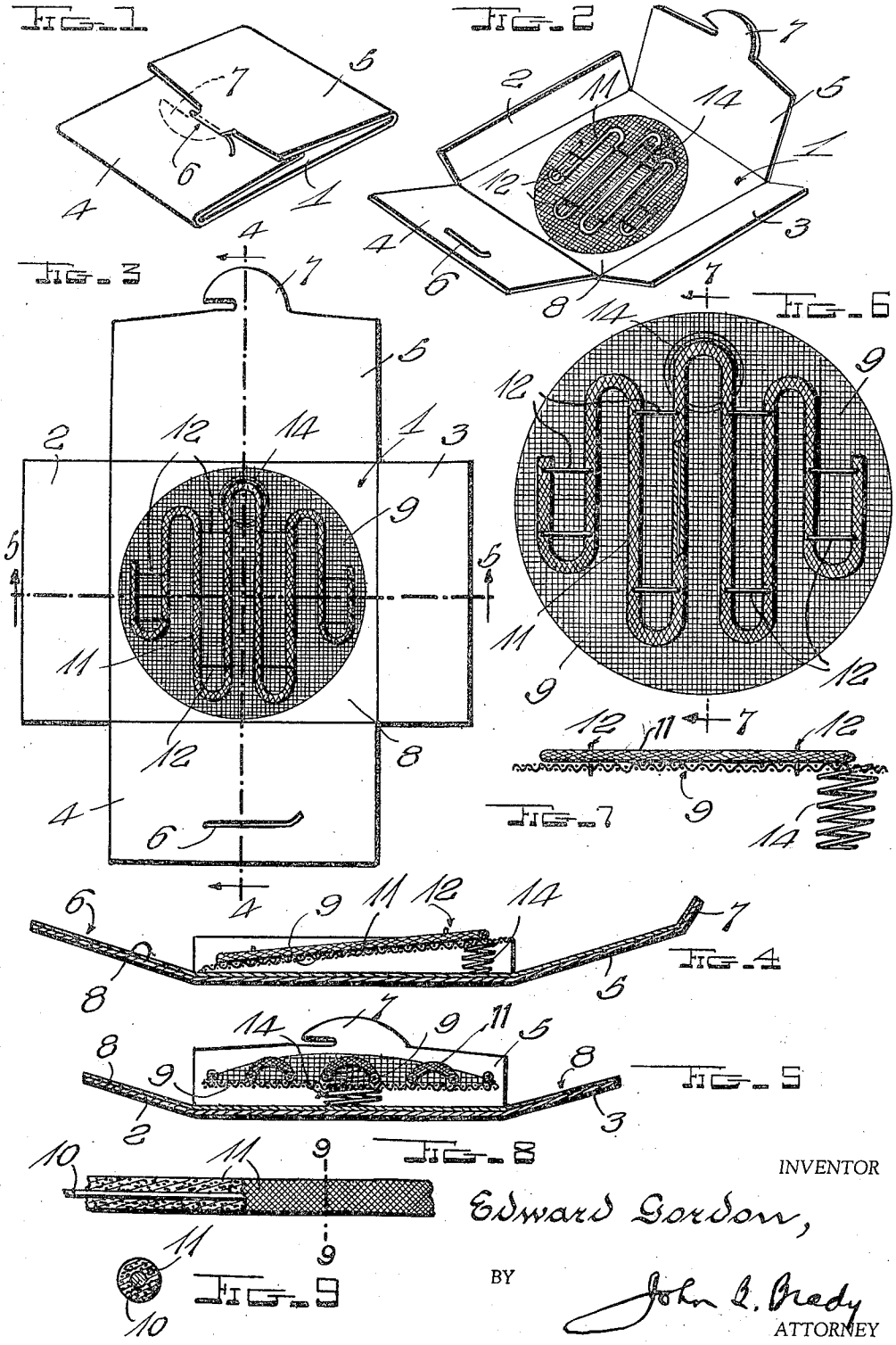
Oct. 9, 1956 E. GORDON 2,765,579

INSECT REPELLENT DEVICE

Filed June 3, 1955



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United States Patent Office

2,765,579

Patented Oct. 9, 1956

2,765,579

INSECT REPELLENT DEVICE

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Application June 3, 1955, Serial No. 512,956

12 Claims. (Cl. 43—127)

My invention relates broadly to an insect repellent and more particularly to a wick-type fumer for aiding in reducing annoyance from mosquitoes and sandflies, and otherwise distributing fumes for a variety of purposes.

One of the objects of my invention is to provide a construction of readily merchandiseable package in which a wick-type fumer may be distributed and placed in use upon opening the package for disseminating fumes for repelling insects and aiding in reducing annoyance from mosquitoes and sandflies.

Another object of my invention is to provide a construction of fumer package comprising a foldable container, unfoldable from a flat packaged position to an open position and having a lining of heat-reflective material adapted to direct fumes from a carbonized wick carried by a supporting member within the package.

Another object of my invention is to provide an arrangement for mounting a carbonized wick, saturated with fume-penetrating chemicals, in a fumer package on a support which is automatically elevated when the package is opened to permit the circulation of air through the support and the dissemination of fumes from the carbonized wick.

Still another object of my invention is to provide a structure of carbonized wick braided over a metallic core and which is saturated with fume-generating chemicals comprising active ingredients of pine oil, methyl salicylate, oil of eucalyptus, turpentine, thymol, oil of citronella, dimethyl phthalate, camphor, menthol, cedar wood oil, allethrin (allyl homolog of cinerin I), fir needles oil, sassafras oil, anise oil, pyrethrins; and inert ingredients of carbon, and petroleum distillate.

Still another object of my invention is to provide a package enclosing a support for a carbonized wick consisting of a foraminated screen supported at one edge on a heat-reflecting surface and mounted at the other end on an expansion coil spring adapted to elevate the support when the package is opened for permitting the circulation of air through the screen and the dissemination of fumes from the carbonized wick, while the wick is smoldering.

Other and further objects of my invention reside in the manner of attaching the carbonized wick to a foraminated screen as set forth more fully in the specification hereinafter following by reference to the accompanying drawings in which:

Fig. 1 is a perspective view of the fumer package of my invention in closed position ready for shipment or distribution as a merchandiseable package;

Fig. 2 is a perspective view of the fumer package in open position ready for the lighting of the carbonized wick and the dissemination of fumes;

Fig. 3 is a plan view of the package showing the carbonized wick arranged therein;

Fig. 4 is a vertical sectional view through the open package of Fig. 3, taken on line 4—4 thereof;

Fig. 5 is a cross sectional view through the open package of Fig. 3, taken on line 5—5 thereof;

Fig. 6 is a plan view of the carbonized wick mounted in position on a foraminated screen, the view being shown on a somewhat enlarged scale;

Fig. 7 is a sectional view through the foraminated screen showing the carbonized wick mounted in position thereon and illustrating the expansion coil spring associated with the screen adjacent one peripheral edge thereof;

Fig. 8 is an elevational view partially in section of a fragmentary portion of the carbonized saturated wick of my invention; and

Fig. 9 is a vertical sectional view taken on line 9—9 of Fig. 8.

My invention is directed to a readily merchandiseable fumer package which encloses a carbonized chemically-saturated wick having a variety of applications, such as a distributor of fumes or smudge, and particularly adapted as a non-toxic repellent for mosquitoes, sandflies, and other insects. The wick constituting my invention is produced from soft cotton yarn which is braided around a soft iron wire core. This braided cotton is normally white. In applications where the product is to be used as a generator of fumes for repelling mosquitoes, ants, and sandflies, I mount the untreated white braided cotton cord with the iron wire core therein in a sinuous form on a circular wire screen of 12 x 12 mesh. The white braided cotton cord is attached to the screen by sewing or stapling and the like. Where the braided cotton is attached by stapling care is taken to attach the staples between the spaced substantially parallel portions of the cotton cord and not across the iron wire core of the cord. Such stapling, transverse of the core, tends to decrease the effective use of the device after treatment and when used as a fumer-generator as hereinafter explained in more detail. The braided cotton cord formed and attached to the wire screen, as explained, is now carbonized by treatment on the rotary hearth of a gas-fired oven. The rotary hearth of the oven is continuously rotated and carries the individual screen-supported cords through a circular path continuously subjected to heat from directions both above and below the rotary hearth at temperatures within the range of 250° to 800° F. The treatment to which the screen-mounted cord is treated is not one of combustion but of carbonization. No combustion is present as the cords are not subjected to the impingement of flames thereon, but are carefully protected from flame by an arrangement of rotary hearth and annular oven disposed above the hearth. Gas burners are arranged beneath the rotary hearth and maintain the rotary hearth at a temperature sufficient to carbonize the cotton cord.

The cord within the cycle of treatment is modified from its textile condition of white color to a black condition resembling carbon. The carbonized cord is now saturated with oils constituting fume generating chemicals. I have found the following ingredients most effective:

Active: Pine oil, methyl salicylate, oil of eucalyptus, turpinetine, thymol, oil of citronella, dimethyl phthalate, camphor, menthol, cedar wood oil, allethrin (allyl homolog of cinerin I) fir-needles oil, sassafras oil, anise oil, pyrethrins.	
Percent active ingredients	68.55
Inactive:	
Carbon, petroleum distillate.	
Percent	31.45
Total	100.00

In order to use the device it is simply necessary to open the package whereupon the screen member springs upwardly and a match may be applied to put a flame to the carbonized wick. After a brief time interval the

flame is blown out, whereupon the cord continues to smolder as a wick and generates fumes which I have found to be most effective as a repellent for insects, mosquitoes, ants, and sandflies. The smoldering of the wick may continue for a time interval for as much as four hours. The package is of such convenient size that it may be readily used in a home, on porches, in trailers or automobiles, or house-boats, and in such other areas when camping, hunting, boating, scouting, and in outdoor barbecues, in tents, hotels, motels, and drive-in theaters. When the fume generator is no longer required it may be extinguished by merely closing the package.

Referring to the drawings in more detail, reference character **1** designates a moisture-proof package which is readily die-cut from cardboard or heavy paper and provided with side folds **2** and **3** and end folds **4** and **5**. The end fold **4** contains a slot **6** while the opposite end fold **5** has a tongue **7** thereon which coacts with slot **6** and enables the package to be secured in closed position, as in Fig. 1, with the fumer device enclosed within the package. The interior surface of the package is covered by heat-reflective metal surface which I have indicated at **8**. This surface is formed from a metallic foil such as tin or aluminum foil and serves to direct heat upwardly and outwardly from the package when the fumer is in operation.

A metallic foraminated screen **9** is enclosed by the package for supporting the carbonized wick, shown generally at **11**. The screen **9** is generally circular in contour although the screen may be cut into rectangular or square form to fit within the package. The carbonized wick is formed by the braided carbonized material **11** supported over the steel core **10**. The braided carbonized material of the wick is saturated with the following ingredients:

Active: Pine oil, methyl salicylate, oil of eucalyptus, turpinetine, thymol, oil of citronella, dimethyl phthalate, camphor, menthol, cedar wood oil, allethrin (allyl homolog of cinerin I) fir-needles oil, sassafras oil, anise oil, pyrethrins.	
Percent active ingredients	68.55
Inactive:	
Carbon, petroleum distillate.	
Percent	31.45
Total	100.00

The treated carbonized wick **11** supported by the foraminated screen **9** is arranged in a serpentine path as illustrated in Figs. 2, 3 and 6. The wick is stapled to the screen in a very special manner. As shown in Figs. 2, 3 and 6, the wick consists of a number of loops which are substantially sinusoidal and which vary from a maximum amplitude centrally of the supporting member **9** to a minimum amplitude adjacent opposite edges of the supporting member. That is to say, the wick varies from a maximum length adjacent the central part of the screen **9** to minimum lengths at opposite edges of the screen **9**. The loops which form the wick have lineal portions which extend on longitudinal axes that are parallel to a medial line between the edges of the supporting screen **9** and the parts of the wick are symmetrical on either side of the said medial line. The ends of the lineal portions of the loops on either side of the central loop are interconnected through curved portions. The wick is secured to the screen **9** by staples **12** which extend transversely across the lineal portions of the wick in spaced positions as shown more clearly in Fig. 5. That is to say, the extreme end loops are fastened to screen **9** by staples **12** adjacent the extreme ends of the wick and a point intermediate the lineal portion of the adjacent turn of the loops. The loops on either side of the central loop are fastened to the screen **9** by staples distributed between the closed ends of the loops and the open ends thereof, as shown. The staples offer minimum obstruction to the release of fumes and yet maintain the wick on the screen **9** during shipment and use and while the wick is being consumed by smoldering during use of the device.

An expansion coil spring **14** is secured to the underside of one edge of the screen **9**. One end of the expansion coil spring **14** rests against the heat-reflecting surface **8** while the other end of the coil spring is attached to the screen **9**. The screen **9** may thus be maintained flat within the package **1** as represented in Fig. 1, with the expansion coil spring **14** in collapsed or compressed position. As soon as the package is opened, as represented in Figs. 2, 3, 4 and 5, coil spring **14** expands and elevates screen **9** above the heat-reflecting surface **8** where the opposite edge of the screen **9** serves as a fulcrum about which the screen **9** is raised. Thus there is sufficient space maintained between heat reflective-surface **8** and the under surface of the wick **11** to insure the circulation of air through the screen and the dissemination of the fumes from the wick when the end of the wick is lighted and blown out.

Generally the package **1** is merchandised within an envelope container and is removed from the envelope container and the package opened. Upon opening of the package, as shown in Fig. 2, spring **14** expands to project the edge of screen **9** upwardly, tilting the screen **9** so that air may readily circulate therethrough as indicated in Fig. 4. The end of the wick **11** is now lighted by a match and the flame then blown out as the wick must smolder, but not flame. The package with the wick **11** in a smoldering state is placed on the floor or ground with the metallic heat-reflective surface **8** directed upwardly. For the best results the repellent is placed in the immediate vicinity of persons or pet animals to be protected, preferably so that vapors will drift over the areas desired to be protected. To extinguish the wick the package is closed by turning in the side folds **2** and **3** and the end folds **4** and **5**, and latching them in position by inserting tongue **7** into slot **6**, whereupon the smoldering wick **11** is snuffed out and the smoke disappears.

The package is readily reusable and can be relighted when needed, using the same procedure heretofore described. The wick may be reused until it is entirely consumed by smoldering. Often a single loop remains and yet that remains highly effective for reuse. I have found the device highly satisfactory in repelling mosquitoes and sandflies, and reducing annoyance from these insects. The device is effective both indoors and outdoors. It is particularly suitable when fishing, in outdoor theatres, in backyards, on porches, and in trailers.

While I have described my invention in certain of its preferred embodiments, I realize that modifications may be made and I desire that it be understood that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States, is as follows:

1. A fumer package comprising a foldable container unfoldable from a flat packed position to an open position, a lining of heat-reflective material on the inside of said container, a supporting member mounted in said container, a carbonized wick carried by said supporting member and means for elevating said supporting member in an inclined plane above the surface of said heat-reflective lining in said container when said container is in open or unfoldable position.

2. A fumer package as set forth in claim 1 in which said carbonized wick is fastened to said supporting member in a serpentine path for combustion in a progressive path corresponding to the serpentine formation of the wick.

3. A fumer package as set forth in claim 1 in which said supporting member is a foraminated screen through which air is circulated for distributing the fumes of combustion from said wick.

4. A fumer package as set forth in claim 1 in which said carbonized wick is formed in a serpentine path with portions of the wick extending in spaced lineal positions substantially parallel with each other and interconnected at their ends by transverse curved portions, and staples extending through said supporting member and the portions of said wick disposed in lineal positions.

5. A fumer package as set forth in claim 1 in which the means for elevating said supporting member in an inclined plane above the surface of said heat-reflective lining consists of an expansion coil spring attached to the outer periphery of said supporting member and operative to project one edge of said supporting member upwardly with the opposite edge resting on the surface of said lining of heat reflective material when said package is unfolded to open position.

6. A fumer package as set forth in claim 1 in which said carbonized wick is impregnated with 68.55% of pine oil, methyl salicylate, oil of eucalyptus, turpentine, thymol, oil of citronella, dimethyl phthalate, camphor, menthol, cedar wood oil, allethrin (allyl homolog of cinerin I), fir needles oil, sassafras oil, anise oil, and pyrethrins.

7. A fumer package as set forth in claim 1 in which said carbonized wick contains pine oil, methyl salicylate, oil of eucalyptus, turpentine, thymol, oil of citronella, dimethyl phthalate, camphor, menthol, cedar wood oil, allethrin (allyl homolog of cinerin I), fir needles oil, sassafras oil, anise oil, and pyrethrins.

8. A fumer package as set forth in claim 1 in which said carbonized wick consists of 31.45% of carbon petroleum distillate and 68.55% of pine oil, methyl salicylate, oil of eucalyptus, turpentine, thymol, oil of citronella, dimethyl phthalate, camphor, menthol, cedar wood oil, allethrin (allyl homolog of cinerin I), fir needles oil, sassafras oil, anise oil, and pyrethrins.

9. A fumer package as set forth in claim 1 in which said carbonized wick is formed by a braided carbonized material supported on a central wire core.

10. A fumer package as set forth in claim 1 in which said means for elevating said supporting member is disposed at one peripheral edge of said member and raises said edge when said container is in an open position with the opposite edge resting on said lining of heat-reflective material, and wherein said carbonized wick has lineal portions extending on longitudinal axes that are parallel to a medial line between the aforesaid edges of said supporting member.

11. A fumer package as set forth in claim 1 in which said carbonized wick has lineal portions which vary from a maximum length centrally of said supporting member to a minimum length adjacent opposite edges of said supporting member.

12. A fumer package as set forth in claim 1 in which said carbonized wick is symmetrically distributed over said supporting member in loops which are substantially sinusoidal and which may vary from amaximum amplitude centrally of said supporting member to a minimum amplitude adjacent opposite edges of said supporting member.

No references cited.