Sept. 4, 1962 J. M. NESS 3,051,966

CUSHIONED SEAT VENTILATOR

Filed Dec. 1, 1960

Fig. 1

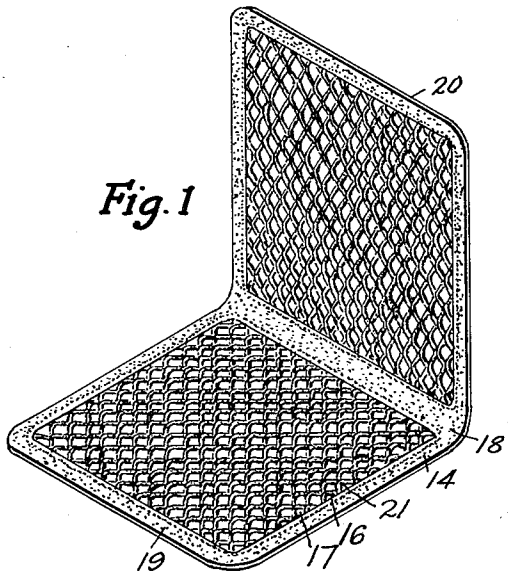


Fig. 4

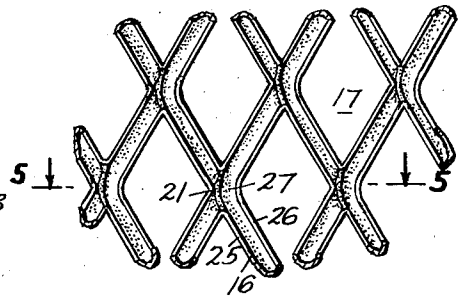


Fig. 2

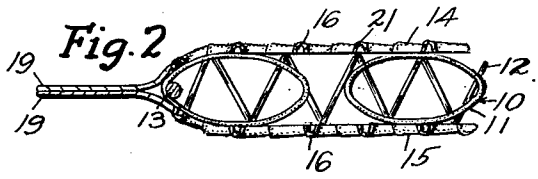


Fig. 5

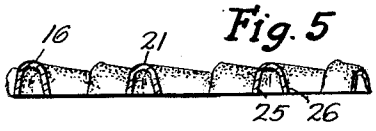


Fig. 6

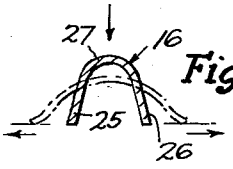


Fig. 3

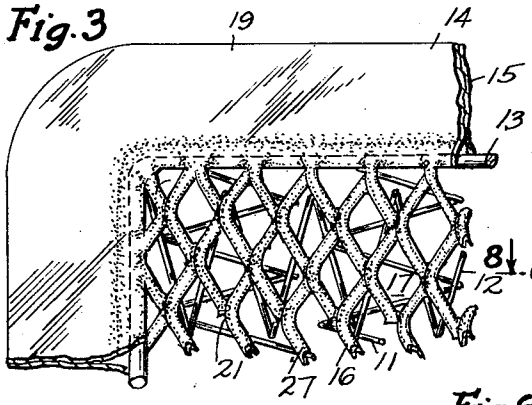


Fig. 7

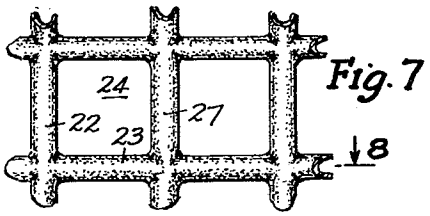
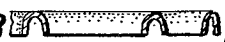


Fig. 8



INVENTOR.

James M. Ness

BY

Harry Jacobs

ATTORNEY

United States Patent Office

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CUSHIONED SEAT VENTILATOR

James M. Ness, Highlands, N.J., assignor to R. O. Kent Corp., New York, N.Y., a corporation of New York

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10 Claims. (Cl. 5—347)

This invention relates to cushioned seat ventilators and the like and particularly to the covers or casings for the inner coiled wire unit of such ventilators.

The invention contemplates the provision of a relatively inexpensive casing for the inner unit, which casing has resilient and cushioning properties for the comfort of the user, and yet which does not appreciably lessen the ventilating air space when loaded.

The invention further contemplates the provision of an inexpensive one piece mesh or net-like cover of synthetic plastic material for the major part of each face of the unit, the marginal portions of the cover being imperforate and secured to the corresponding marginal portion of the cover for the other face of the unit by means other than stitching.

The invention further contemplates the provision of a seat ventilator having mesh covers for the front and rear faces of the inner unit, the covers being resilient and heat sealed together at the edge portions thereof and made of sheet plastic material and of such shape and structure as to resume the original shape thereof when any load thereon has been released, the covering comprising channel-shaped elements of substantially uniform thickness of material.

The various objects of the invention will be clear from the description which follows and from the drawings, in which

FIG. 1 is a perspective view of a typical seat ventilator to which the invention has been applied, those parts which would be seen through the openings of the front cover having been omitted for clarity of illustration.

FIG. 2 is a fragmentary sectional view of the edge portion of the ventilator, showing the similar front and rear covers and the inner unit.

FIG. 3 is an elevational view thereof, the net-like central portion of the rear cover having been omitted for clarity.

FIG. 4 is a fragmentary enlarged rear elevational view of one of the covers, showing the channel-shaped elements of the mesh and the uniform thickness thereof.

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4.

FIG. 6 is a cross sectional view, greatly enlarged, of a single mesh element showing in dash-dot lines the shape which the element tends to assume as it flattens under load.

FIG. 7 is a fragmentary elevational view of a modified form of the mesh cover.

FIG. 8 is a sectional view taken on the line 8—8 of FIG. 7.

The inner coiled wire unit 10 may be of any suitable form and material, but as shown, it is of the type disclosed in the Crane Patent No. 2,801,681. In said patent, the flattened coils of rows as 11 and 12 of coiled wire intersect and are interlocked, the rows being formed of a length of coiled wire wound around a thicker border wire as 13. Heretofore, the covers forming the casing for the unit have been an open mesh fabric woven of twisted paper yarn or the like having a relatively short useful life, and possessing little, if any, resilience.

In the present invention, the front cover 14 and the rear cover 15 are not made of yarn, but are instead made of intersecting integral rows of yieldable line elements 16. Such yieldable elements are resilient and serve to impart a desirable cushioning characteristic to each face of the otherwise laterally incompressible inner unit, supporting

the body as well as conforming to the shape of the body. Heretofore, cushioning action could not easily be attained without sacrifice of ventilating space in the ventilator, and the seat cushion or back which the ventilator covers, if upholstered, was depended on for whatever cushioning action was procurable. Where the ventilator herein disclosed is intended to cover the back as well as for the seat, a second similar unit is arranged in spaced relation to the unit 10 of FIG. 2 as seen in FIG. 1, and the covers are suitably extended over such second unit. Each element 16 is so formed and shaped that it yields individually under load but resumes its initial shape when the load thereon is removed.

The entire casing for both seat and back units may be made of a single piece of material devoid of stitching and binding tape or other finishing or securing means. In that case, two spaced apart mesh areas for the central part of the front cover and two similar areas for the central part of the rear cover are separated by imperforate intermediate portions 18. Each cover also has imperforate marginal portions 19, the corresponding adjacent portions being suitably secured to each other as by heat sealing, indicated by the stippling in FIG. 1 at such portions 18 and 19. Such sealing is possible when the covers are made, as contemplated herein, of suitable thin flexible plastic sheet material such as polyethylene. When made of one piece, the cover, before heat sealing, is folded in half along one edge as at the top edge 20 of the back member. When made of two pieces 14 and 15, the marginal portions 19 of the covers are heat sealed together, as are the intermediate portions 18 which form the hinge connection between the units. Obviously, the same type of mesh need not necessarily be used on both the front and back covers, but similar mesh is preferred to make the ventilator reversible. As shown in FIG. 2, the connected marginal portions 19 lie in about the same plane as that of the axes of the coils of the inner unit, that is, about half way between the front and rear faces of the ventilator. The connected intermediate hinge portions 18 are similarly arranged half way between the faces of the units.

The cover is made of a flexible plastic by a suitable process and suitable equipment to make the mesh openings 17 and the mesh elements 16 of the proper shape. As shown in FIGS. 1, 3 and 4, the openings are diamond shaped and the tops of the elements are not coplanar but are arranged in a step-like formation having a high point at the curved corner 21 thereof. In FIG. 7, the tops of the elements are in the same general plane, the rows 22 and 23 intersect at right angles and the openings 24 are approximately square.

To attain the cushioning effect desired, regardless of the shapes of the openings or of the mesh elements, each element is of substantially uniform thickness of material and is generally channel-shaped or of inverted U-shape in cross section. The legs 25, 26 are each free at the inner end and at the outer ends thereof, the legs are joined by the web 27 as is best seen in FIG. 6. The inner ends of the channel legs rest, at some points, on the inner wire unit, or, when loaded, said ends are forced inwardly against the unit to make contact therewith at various points. When so loaded, the element tends to flatten out as shown by the dash-dot lines and the arrows of FIG. 6, thereby cushioning the load and resulting in a more comfortable seat for the user. On release of the load, the elements, though thin, spring back and resume the initial channel shapes thereof.

It will be seen that there has been provided hereby, a relatively inexpensive peculiarly shaped casing adapted to be made of a single piece of flexible sheet plastic and devoid of stitching or binding tape, but adequately secured to the inner unit and providing a desirable cushion-

ing action not present in interlocked units as heretofore covered, and that the various objects of the invention have been effectively attained.

While certain specific forms of the invention have herein been shown and described, various obvious changes have been made therein without departing from the spirit of the invention defined in the appended claims.

I claim:

1. In a seat ventilator, an inner spacing unit and a cushioning ventilating casing for the unit comprising an integral plastic mesh of a single piece of resilient material having relatively large openings therein separated by intersecting elements bounding the openings, each of the elements being channel-shaped in cross section throughout the length thereof and being of substantially uniform thickness of material and being integral with the intersecting elements at the intersections thereof.

2. The ventilator of claim 1, each element having a pair of spaced apart legs free of each other and free of the other elements at an end thereof except at said intersections and integrally connected by a continuous web at the other end thereof, the legs being adapted to spread apart toward a flattened position independently of the legs and of the other elements between intersections on the application of load to the web, the legs being sufficiently resilient to assume the initial positions thereof on the release of the load.

3. The ventilator of claim 1, the openings being quadrilateral in outline, the material being thin flexible plastic, each of the elements being closed throughout one side thereof and open throughout the other side thereof and thin enough to and adapted to flatten when loaded and to resume the channel shape thereof when unloaded independently of the other elements between said intersections and at the points where the element is in contact with the unit.

4. The ventilator of claim 1, the mesh covering one face of the unit, a similar mesh covering the opposite face of the unit and means for securing together the adjacent marginal portions of the meshes, said portions being imperforate and the elements being in contact with the unit at random points thereof.

5. In a seat ventilator, an inner unit and a cover for a face of the unit comprising an integral perforate member having spaced apart rows arranged in two intersecting sets, each row extending from one side of the cover to another side and comprising mesh-forming elements each having a continuous uninterrupted cross section of inverted generally U-shaped form throughout the length thereof integral with the rows of the other set at the intersections thereof only, each element being normally in contact with random points of the unit and being adapted to flatten under load and being sufficiently resilient to return to the initial shape thereof when the load thereon is released, thereby to enlarge the area of contact of the element with the unit when the element is loaded.

6. The ventilator of claim 5, a second similar back member in longitudinal spaced relation to the first mentioned member, an intermediate imperforate portion arranged transversely between and integrally joining the members and an imperforate marginal portion on each member.

7. The ventilator of claim 6, a second unit in spaced relation to the first mentioned inner unit and a second similar cover for the opposite face of the units secured to the first mentioned cover at the imperforate intermediate and marginal portions whereby the units are hinged together at the intermediate portions.

8. In a seat ventilator, an inner spacing unit and a cushioning ventilating casing for the unit comprising a resilient one piece net of plastic material having a multiplicity of relatively large spaced apart openings therein, said net having continuous elements bounding and outlining each of the openings, each element separating adjacent openings from each other and having in cross section a pair of laterally extending legs joined at an end thereof, the legs being substantially free of each other at the other end thereof and adapted when load is put thereon to move apart toward a flattened position of the element at the points where the element is in contact with the inner unit, and thereby to increase the area over which the element is in contact with the inner unit, said element being integrally bonded to those elements adjacent thereto at the points at which said element is in contact with said adjacent elements, each element being sufficiently resilient to return to the initial position thereof when relieved of the load thereon.

9. The seat ventilator of claim 8, each element being of inverted U-shape and the otherwise free ends of the legs being in contact with the unit at random points.

10. In a seat ventilator having an inner coiled spacing unit, a one piece resilient plastic mesh constituting a cover for the unit and distributing the pressure of the body of the user on the unit, said mesh having a plurality of relatively large openings therethrough over the major part of the area thereof, the openings being outlined and bounded by continuous elongated elements in contact with adjacent similar elements and integrally bonded thereto at the points of contact therewith, each element having in cross section a pair of laterally extending spaced apart legs joined at an end thereof by an integral connecting web, the legs being substantially free of each other at the other end thereof and free to spread apart toward a flattened position when loaded, and being sufficiently resilient to return to the initial position thereof when the load thereon is released.

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