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RESILIENT VENTILATED PILLOW AND CUSHION ASSEMBLIES

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FIG. 1

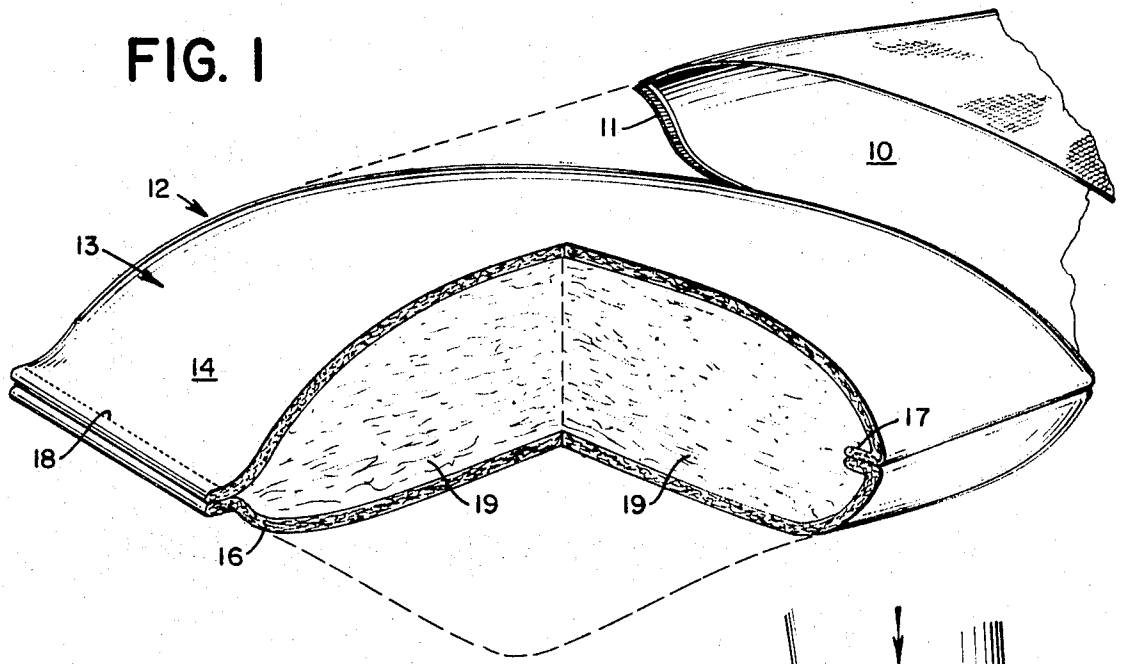


FIG. 2

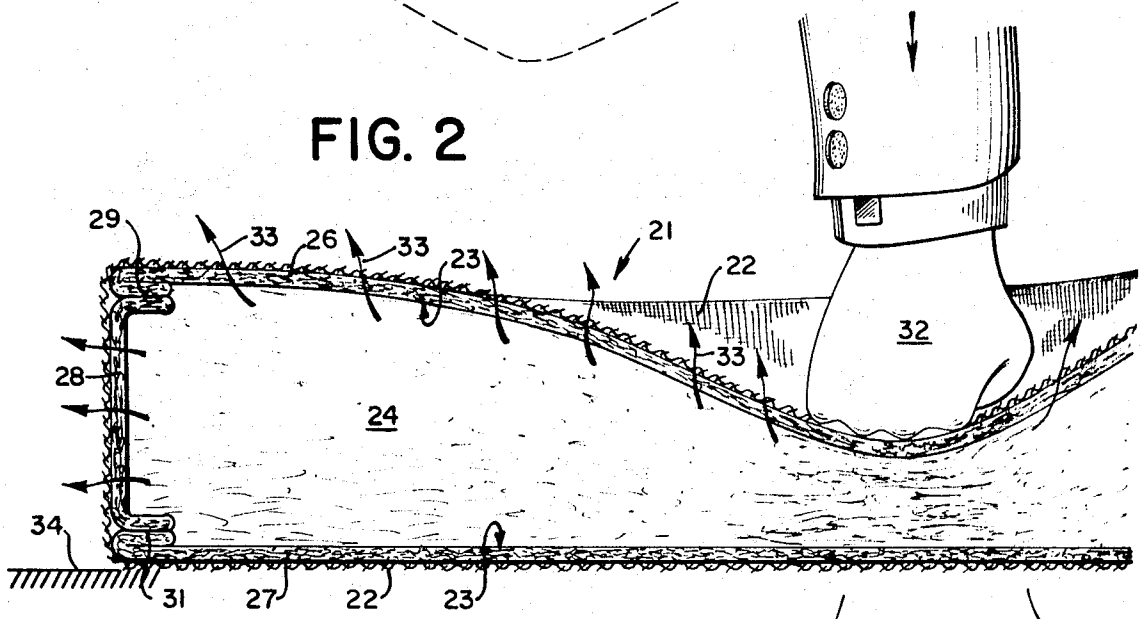
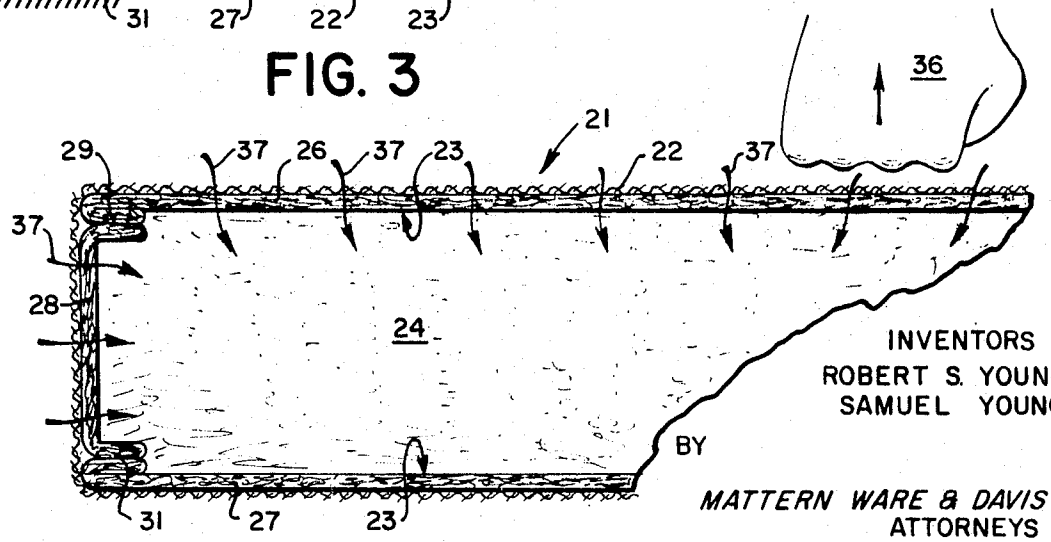


FIG. 3



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RESILIENT VENTILATED PILLOW AND CUSHION ASSEMBLIES

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ABSTRACT OF THE DISCLOSURE

Porous resilient pillow assemblies characterized by a resilient compressible pillow insert adapted for insertion within an outer casing or cover and characterized by a porous envelope of felted resilient fiber material formed of interlocked polymer fibers in a layer of substantial thickness, serving to enclose and contain a resilient, depressible body of porous filler and forming therewith a readily depressed resiilent body of pillow or cushion-shape combining resilient depressibility with springy resilient return capability enhanced by the highly porous nature of both the envelope and the enclosed filler material, allowing facile entrance and exit of the surrounding air through the envelope into the interior of the pillow or cushion.

This invention relates to highly resilient pillows and cushions having unusually soft, compliant depressibility combined with quick, springy return to their uncompressed shape upon the removal of loads or compressing forces.

BACKGROUND OF THE INVENTION

Conventional pillows and cushions are customarily formed with non-porous and often of air-impervious casings or tickings surrounding the resilient filler material. For example, ordinary sleeping pillows with ticking formed of closely woven textile fabric encased in one or two closely woven textile fabric pillow cases may provide the desired degree of compressibility under the user's head, but the non-porous nature of the various layers of textile materials encasing the filler material retard or prevent the entrance of atmospheric air into the filler material when the load is removed from the pillow.

In a similar way, cushions, mattresses and furniture upholstery cushioning customarily employs an air-impervious casing of leather, plastic or tightly woven textile fabric. As a result, mattresses and upholstery cushions often require compression coil springs to provide the desired restoration of the upholstery cushioning to its unloaded configuration. As a result of continued use, compression springs such as conventional coil bed springs or the arched, undulated wire springs employed in automobile upholstery often sag and break, ending the usefulness of the upholstered cushion material.

Accordingly, there has long been a need for pillows and cushions having highly porous envelopes enclosing the filler material and permitting quick and convenient escape of air from the interior of the pillow assembly upon the application of compressive loads, followed by equally quick and convenient return of atmospheric air through the envelope into the interior of the pillow when the load is removed.

SUMMARY OF THE INVENTION

The resilient compressible and porous pillow and cushion assemblies of the present invention achieve this desirable result by employing highly porous enclosing envelopes enhancing the flow of air into and out of the pillow enclosure with changes in applied loads. These porous envelopes facilitate the resilient restoration of the compressed filler material upon removal of loads, eliminating moisture condensation and dampness and providing a cool, soft, dry and comfortable pillow or cushion having attractive and desirable shape restoring characteristics. The natural resilience and elastic memory of the resilient filler material is thus supplemented and enhanced by the ventilating porosity of the enclosing envelope, eliminating the need for perforated vents and providing immediate rstoration of the pillow or cushion to its unloaded configuration in its original, plump and inviting form.

Accordingly, a principal object of the invention is to provide pillows, cushions and upholstery cushioning structures providing soft, comfortable, compressibility, coupled with interior ventilation of the filler material and quick return to unloaded configuration upon the removal of loads.

Another object of the invention is to provide such pillows and cushioning structures incorporating a highly porous envelope encasing the filler material and forming an enclosure having dimensional stability coupled with excellent shape-restoring action.

A further object of the invention is to provide such pillows and cushion structures suitable for use with all shapes, sizes and thicknesses of cushioning assemblies.

Other and more specific objects will be apparent from the features, elements, combinations and operating procedures disclosed in the following detailed description and shown in the drawings.

The drawings:

FIG. 1 is an exploded view of a cushion assembly incorporating an embodiment of the present invention, partially broken away to show its internal structure.

FIG. 2 is a fragmentary cross-sectional elevation view of another embodiment of the present invention shown in its compressed, loaded condition, and

FIG. 3 is a corresponding fragmentary cross-sectional elevation view of the embodiment of FIG. 2 after the removal of compression load, and shown in its restored, unloaded condition.

POROUS ENVELOPE

The embodiments of the present invention illustrated in the drawings incorporate a relatively thick, highly porous envelope preferably formed of interlocked, "bonded" or "felted" polyester fibers serving as the "ticking" or principal casing enclosing the resiilent filler material of the cushion or pillow. These highly porous envelopes possess substantial dimensional stability, and also provide unusually free ventilation of the internal filler material directly through the entire envelope.

In the bed pillow illustrated in FIG. 1, the pillowcase **10** has been removed, after unzipping its zipper **11**, revealing a pillow insert **12** typifying the assemblies of the present invention. This pillow insert **12** incorporates a hollow closed envelope **13**, fabricated from relatively thick sheets of felted polyester fibers, an upper sheet **14** and a lower sheet **16**. These sheets may be approximately one-half inch thick, for example, and they are secured together around their mating edges to form the enclosure of envelope **13**.

If this pillow insert **12** is rectangular, the sheets **14** and **16** may be joined by inturned seams **17**, stitched or otherwise joined together around three sides of the rectangular enclosure **13**, leaving enclosure **13** open at one end. The enclosure **13** may be then inverted, exposing the free edges defining its remaining open and juxtaposed, ready to be stitched together to form the closing seam **18** shown at the left-hand side of FIG. 1.

"Bonded" sheets of polyester fibers between about 1/16" and 1" thick, and preferably about 1/2" thick, are highly

suitable for fabrication of the envelopes for the pillows and cushions of the present invention, although different thicknesses may be employed if desired. In these relatively thick layers, the fibers are and only interlocked and "bonded" at random points of contact by heat, adhesive or chemical action, leaving the major portion of the layer's total volume occupied by interconnecting air-transmitting passageways between the fibers. These envelopes exhibit highly desirable permeability to the flow of air because of the extreme porosity provided by the numerous communicating spaces between the felted fibers. At the same time, these "bonded" felted sheets of polyester fiber are unusually depressible and resilient, thus enhancing the over-all resilient compressibility of the assembled pillow formed by loading envelope **13** with compressible filler material **19**. This filler material may be loosely packed resilient fibers of polyester or other synthetic polymers; filler material **19** may also be formed of conventional feathers, kapoc, foam rubber, solid blocks of foam polymer materials, chopped polymer foams or any other compressible, resilient filler material desired.

With all such filler materials, the compliance of the pillow and its prompt restoration after the removal of loads is greatly enhanced by the porosity of the envelopes **13** of the present invention. If pillowcase **10** in FIG. 1 is formed of loosely woven textile fabric material, the escape of air from filler material **19** during the loading of the pillow **12** and the re-entry of air into filler **19** upon the removal of loads are both greatly enhanced by the porosity of envelope **13** cooperating with the high air-permeability of the textile fabric from which the pillowcase **10** is formed.

UPHOLSTERY CUSHION

In the upholstery cushion embodiment shown in FIGS. 2 and 3, the free flow of air into aind out of the filler material is schematically illustrated. FIG. 2 shows an upholstery cushion **21** incorporating a textile fabric casing **22** enclosing a porous envelope **23** surrounding compressible, resilient filler material **24**. Envelope **23**, as shown in FIG. 2, may be formed of an upper sheet **26** and a lower sheet **27** respectively similar to the upper and lower sheets **14** and **16** of FIG. 1; in order to provide the desired flat vertical edge wall commonly found in upholstery cushions, the sheets **26** and **27** may be joined by a wall sheet **28** extending around the entire lateral perhiphery of the cushion **21** and having its upper and lower edges joined by such means as the inturned seams **29** and **31** to respective edges of upper and lower sheets **26** and **27**.

A compressive load schematically represented by the user's first **32** is shown bearing down upon the upper surface of the cushion **21** in FIG. 2, producing deformation and resilient compressive deflection causing the resilient compaction of the compressible filler material **24** beneath the applied compressive load **32**. Escaping air flowing outward through the porous envelope **23** is represented by a plurality of arrows **33**, penetrating through the upper sheet **26** and the wall sheet **28** of envelope **23**, and thus illustrating the highly porous ventilating capability of the entire envelope **23**. In fact, an additional quantity of air also escapes through lower sheet **27** if the underlying support surface **34** is porous enough to receive it or if the textile fabric casing **22** allow its lateral escape. This highly porous ventilating envelope **23** thus permits rapid escape of air from the interior of the compressed filler material **24** upon the application of load **32**, greatly enhancing the resilient compressive deformation capability of the cushion **21**.

The rapid, elastic recovery and return of the cushion

21 to its unloaded shape is illustrated in FIG. 3. The user's fist has now been raised to position **36**, removed from the upper surface of the cushion **21**. The removal of the compression load represented by withdrawal of the user's fist **32** to its retracted position **36** allows the normal elastic resiliency of the compressed filler material **24** to expand to its normal unloaded configuration illustrated in FIG. 3 with extreme rapidity, enhanced by the re-entry of atmospheric air through the upper sheet **26** and the side wall **28** of the porous envelope **23**. This re-entering air is represented by the numerous arrows **37** shown in FIG. 3. By exposing the entire porous peripheral surface of the cushion **21** to the atmosphere, thus allowing re-entry of air on all sides of the assembly, the need for special perforated ventilating screens, grommets or openings is eliminated. The entire exposed surface of the cushion **21** "bleeds" air freely, and as a result, the accumulation of condensed moisture beneath the user is minimized and a cool, soft, dry supporting pillow or cushion is thus produced.

The use of resilient polyester fibers for filler **24** and envelope **23** substantially eliminates allergic reactions among users, since the polyester fibers produce an absolute minimum of dust or powder particles constituting allergens, when compared with such materials as conventional filler, kapoc, feathers, animals fibers, foam rubber or the like.

Since the foregoing description and drawings are merely illustrative, the scope of the invention has been broadly stated herein and it should be liberally interpreted to secure the benefit of all equivalents to which the invention is fairly entitled.

We claim:

1. A highly resilient compressible cushion assembly comprising:

(A) a body of resilient, porous filler material capable of expelling a substantial quantity of air when compressed;

(B) a surrounding envelope enclosing the filler material and formed of a porous layer of interlocking fibers highly permeable to the passage of air drawn into and expelled from the filler;

(C) said fibers being bonded together at their juxtaposed intersections throughout the thickness of said layer; and

(D) said layer comprising between about five percent and about fifteen percent of the total vertical height of the pillow assembly,

whereby the arrayed interlocking of the fibers comprising said envelope layer provides substantial air-transmitting interstices and passageways therethrough without materially reducing the tensile strength or dimensional stability of the envelope layer, while providing compressible deformation and resilient rebound of the cushion assembly, and presenting low resistance to inspiration and expiration of air through said envelope layer.

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