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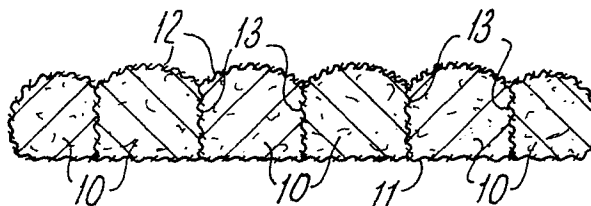
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54 **Quilting.**

57 Quilting having a carcass of cellular construction in which each compartment (10) is so constructed and is partially filled with similar determined amount of filling such that upon reversal of the major surfaces (11, 12), different insulation values under the same given conditions are obtainable.



QUILTING

This invention relates to quilting for use in making, for example, quilted garments such as anoraks, coats, waistcoats, or continental quilts or articles of similar nature, such as, pram quilts, baby nests, or sleeping bags. Quilting heretofore has been formed of a filled flexible carcass. One such carcass comprises simply two pieces of cloth material of similar width and length dimensions and having a soft pad of natural or synthetic material located therebetween and held in position by stitching right through the materials thus closing them together at the stitching points. In another form of carcass the two pieces of cloth material have a series of equi-spaced parallel strips of cloth material stitched between said two pieces thus forming with said pieces a cellular structure with the strips serving as panel walls or partitions to compartment the carcass of the quilting. This invention is particularly concerned with quilting of the second carcass type with a row of parallel compartments, but can be applicable to quilting of the first carcass type. The pieces and walls of a second carcass referred to above, when fully extended and unfilled, define a row of parallel compartments each having a rectangular cross-section, such compartments then having a determined amount of filling located therein before the ends of the compartments are closed by sewing together the two pieces trapping therebetween the internal walls, then collapsed at the outer ends. Hereinafter in the specification and claims, quilting as above described will be referred to as "quilting of the type stated". Thermal insulation in a quilted article is achieved by a mixture of filling material and air. The relative proportions of these can be adjusted to give an optimum insulation value, generally referred to as a "tog" value, and heretofore this value is the

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same irrespective of which surface of the quilting is uppermost.

The main aim of all these constructions and material is to provide a quilt which insulates the user's body from cold air i.e. a person underneath a quilt is kept warm by trapping his/her own body heat. Since air is a good insulator, then the filling materials are chosen generally to have a high air content (usually implying a filling material or large surface area).

Development of this concept has led to the various choices of filling material which when mixed with air provides the best insulator.

Since climatic and seasonal changes affect the amount of heat insulation required at various times of the year, it has been considered desirable to produce quilting to have a functional design which can be made to present, on opposite sides, a totally different fit or drape to the human body since man's thermal comfort and well being depends on the construction of the insulator in addition to the quantitative value of its thermal properties. Ideally also, this is preferably achieved by construction only and not by additions or subtractions, or chemical or other treatment to any one or both sides.

An object of the present invention is to provide quilting for which different insulation values under the same given conditions are obtainable depending on which surface of the quilting is uppermost or outermost.

According to one aspect of the present invention, there is provided quilting of the type stated having a carcass of the second type in which one of the pieces of cloth material has a greater dimension transverse of the compartments than the other piece to give for each compartment opposed sides defined by the two pieces of cloth material different width dimensions, the compartments then having similar determined amounts of

filling located therein resulting in a quilting which upon reversal of the surfaces give different insulation values under the same given conditions.

Preferably, each compartment when fully extended
5 is of trapezoidal cross-section.

According to a second aspect of the present invention, there is provided quilting of the type stated having a carcass of the first type in which the soft pad of natural or synthetic material located in
10 each compartment does not fully occupy the compartment adjacent to one surface.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings, in which:-

15 Figs. 1 and 2 show respectively two vertical cross-sections transverse of a quilt carcass of the second type in an exaggerated extended fashion when in its loose configuration i.e. loose surface uppermost, Fig. 1 as if in space, and Fig. 2 lying on a flat
20 surface;

Fig. 3 shows a vertical cross-section of one compartment of Fig. 2;

Figs. 4, 5 and 6 show respectively vertical cross-sections transversely of one or two compartments in
25 which different fillings arrangements are shown;

Fig. 7 shows a vertical cross-section transverse of a quilt carcass of the second type for a double bed having one longitudinal half reversed relative to the other;

30 Figs. 8, 9, 10, 11, 12 and 13 show different vertical cross-sections of a soft pad for location in a carcass of the first type; and

Fig. 14 shows a top perspective view of a different soft pad for location in a carcass of the
35 first type.

In a first embodiment, quilting of the type stated has a carcass of the second type in which one of the

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pieces of cloth material has a greater dimension transverse of the compartments than the other to give for each compartment opposed sides defined by the two pieces of cloth material of different width dimensions.

5 When fully extended and forming, in space, an arcuate appearance as shown in Fig. 1, each compartment 10 has a trapezoidal cross-section in which the opposed sides 11, 12 are parallel and the panel walls 13 are diverging outwardly in the arcuate appearance. Similar
10 determined amounts of filling are then located in the compartments 10. In the case of natural filling material, this can be duck feathers and down, and in the case of synthetic filling material, this can be discrete pieces of foamed or fibrous plastics material. Also,
15 firmer solid filling 14A can be located in each compartment topped or bottomed by a softer filling 14B of material described above, and shown in Figs. 4, 5 and 6. This embodiment is particularly for quilting for use as continental quilts and like, and the compartments
20 are arranged to run longitudinally of a bed and of a person using said quilt. A quilt above-described will tend to be stretched across its 'shorter' surface 11 i.e. taut, and loose across its 'long' surface 12 i.e. loose, thus giving a curved effect. A general
25 explanation of the function of the quilting is that when as shown in Figs. 2 and 3 the loose side 12 is outer or uppermost and as the air in the compartments heats, e.g. by body heat, then the air expands and tends to rise. The design of the each compartment 10
30 is such that the surface 12 being loose provides the least resistance to this expansion and the maximum volume of air/filling mixture is available for insulation, the top surface 12 bulging upwardly drawing in the panel walls 13 to a parallel or almost
35 parallel state as shown. When the quilting is reversed so that the taut surface 11 is outer or uppermost then

the converse situation arises. Tension in the top surface tries to flatten the surface 11 and restricts the warm air from expanding upwards and lifting the material. In this case the angle of the panel walls 13 also tends to make the surface 11 collapse due to gravity. The combination of these effects produce a smaller volume for air/filling mixture available for insulation.

The above principles involved apply, to a greater or lesser degree, for all widths, angles and heights of panel wall 13, for any number or size of panels and for more or less filling of any type.

It is possible with this type of construction to vary the parameters and achieve a state of equilibrium i.e. where heat gains are countered by equivalent heat losses.

In a second embodiment, quilting of the type stated using a carcass of the second type has filling of natural or synthetic material located in each compartment 10 such as not to fully occupy the compartment 10 adjacent to one surface thereby to allow for air expansion as shown in Fig. 4, 5 or 6. The object of this construction is to change the surface area of the filling and hence the amount of trapped air on one side of the quilting, and leave the other side as normal, or change both sides so as to produce an even greater difference in the amount of trapped air, or to allow drape. This is achieved by the following changes or combination of changes in, or construction of the synthetic or natural material by:

1. Cuts (as shown in Fig. 8)
2. Cut-outs or cut-throughs
3. Corrugation or castellation across width or length (as shown in Figs. 9, 10 or 14)
4. Shaping by chemical means
5. Shaping by heat imprint
6. Mode of original laying of fibres

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7. Harder fibre base with softer top or reverse as shown in Figs. 4, 5 or 6.
 8. Angle of fibre in panel.
 9. All alterations or additives to surfaces, walls or stitching which gives differing tension or slackness on opposing surfaces, including the following:
 - Pleats or darts on surface
 - Air bubbles or pockets longitudinally or latitudinally
 - Flaps
 - Pleats
 - Pleated walls
 - Elastic walls
 - Mixed fabric walls
 - V shaped walls
 - Twin walls
 - Spring walls, velcro walls
 - Hard and/or soft walls
 - Half hard and half soft walls
 - Snap fasteners to alter channels
 - Mixtures of filing by type or weight in split channels
 - Alternate large or small panels
 - 25 Also, the effect can be achieved and /or enhanced either in combination with or separately from the above changes by:
 1. Differing the stitching tension through the material outer or inner.
 2. Stitching erratically, straight, in circles, curves or with a button effect.
- In conjunction with all of the above combinations, the top and bottom, inner and outer surface of the pieces of cloth material may be of the same width or of varying

widths with respect of each other.

In a modification of the second embodiment, quilting of the type stated using a carcass of the first type has a soft pad 16 of synthetic material of same areal dimensions as the two pieces of cloth and having at least one major surface corrugated whereby the compartments when sewn as shown at 15 with tight or loose stitches are not fully occupied by filling thereby leaving an air gap to allow for air expansion and therefore an increase in thermal insulations.

Quilting of the second embodiment is particularly used for quilted garments.

The above-described quilting is beneficial over existing quilting since it gives dual thermal insulation properties and also allows for:-

- A. Double bed quilts to be made 50 per cent (or any other proportion) longitudinally reversed, i.e. one portion one way and the other portion the reverse way (see Fig. 7), i.e. his and hers or vice versa.
- B. The dual thermal property effect can be negated by using either too much or not enough filling.
- C. Compartments can be provided in a variety of ways (see Figs. 4, 5 and 6) to achieve dual thermal properties.
- D. A combination of designs using both natural and synthetic fillings in the one article can achieve the dual thermal property.
- E. The thermal properties of the quilting may be influenced by the choice of colour of cloth. However, for consumer information different colours of cloth can be used, for example pink denoting the warmer side and blue denoting the colder side.

CLAIMS

1. Quilting having a carcass of the second type characterised in that one of the two pieces of cloth material has a greater dimension transverse of the compartments (10) than the other piece to give for each compartment (10) opposed sides defined by the two pieces (11, 12) of cloth material different width dimensions, the compartments (10) then having similar determined amounts of filling located therein resulting in a quilting which upon reversal of the surfaces give different insulation values under the same given conditions.
2. Quilting as claimed in Claim 1, characterised in that each compartment (10) when fully extended is of trapezoidal cross-section.
3. Quilting as claimed in Claim 1, characterised in that the filling is in the nature of duck feathers or down, or an admixture of both.
4. Quilting as claimed in Claim 1, characterised in that the filling is in the nature of discrete particles of foamed or fibrous plastics material.
5. Quilting having a carcass of the first type characterised in that a soft pad (16) of natural or synthetic material is located in each compartment (10), when formed by stitching through the pieces of material and the pad therein, and does not fully occupy the compartments (10) adjacent to at least one surface.

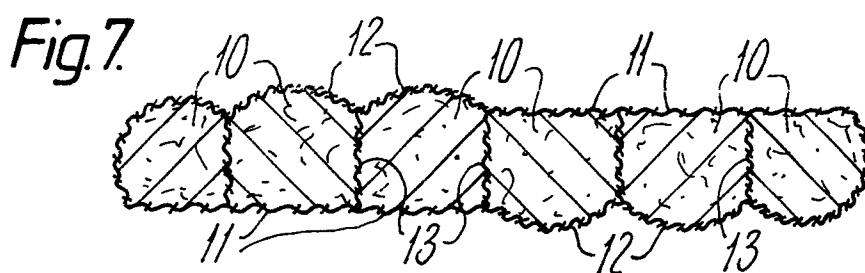
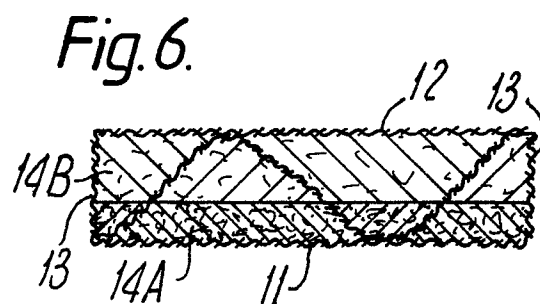
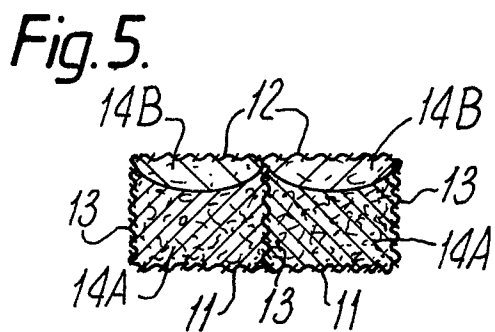
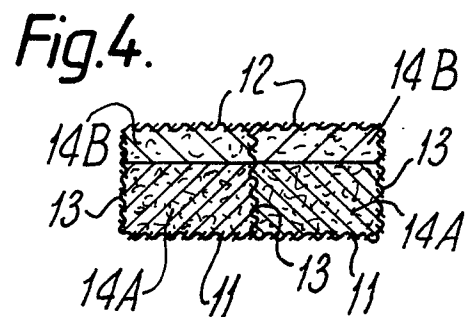
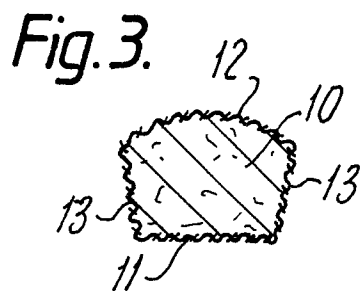
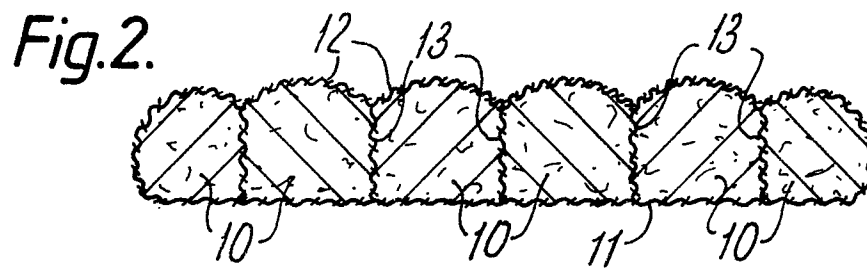
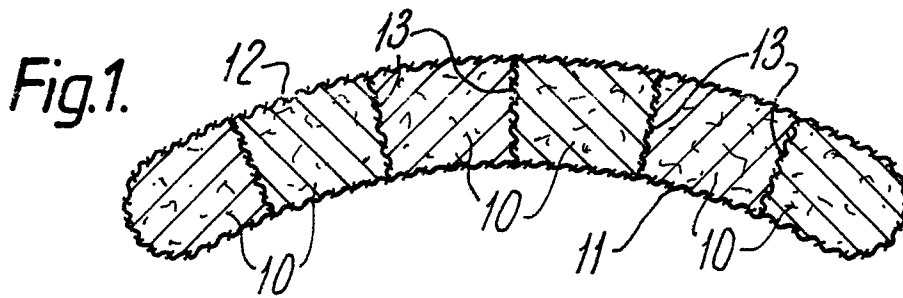
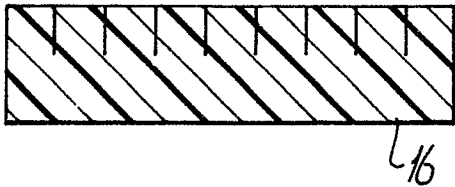
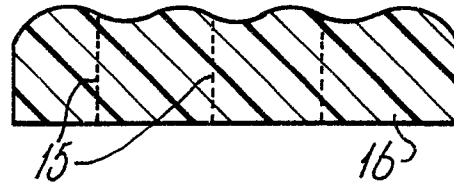
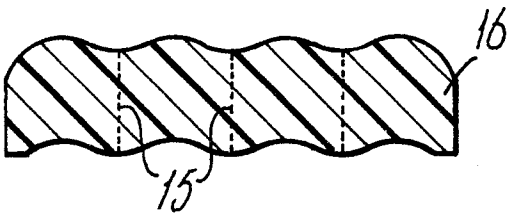
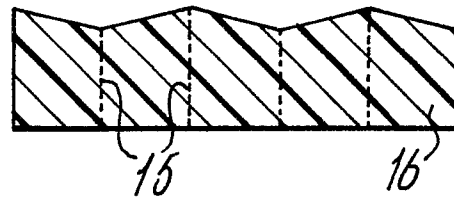
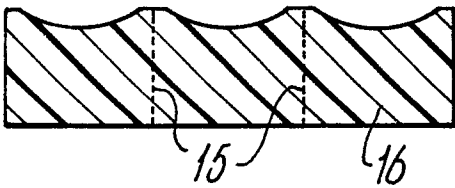
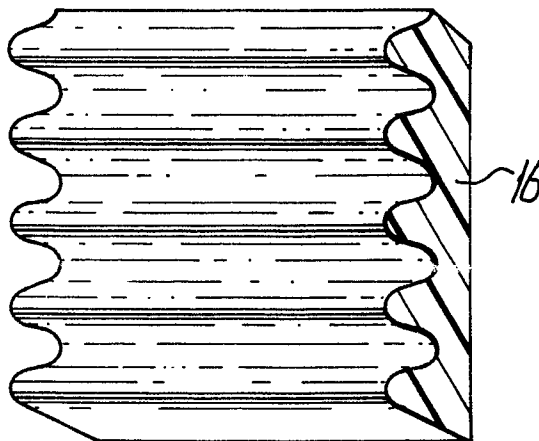


Fig. 8.*Fig. 9.**Fig. 10.**Fig. 11.**Fig. 12.**Fig. 13.**Fig. 14.*



European Patent
Office

EUROPEAN SEARCH REPORT

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Application number

EP 82 30 5785

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
A	FR-A- 526 214 (E.BARON) *Page 1, lines 1-40; page 2, lines 14-26,42-51; claims 1,2a-c; figures 1,5*	1,3	A 47 G 9/02 A 41 D 31/02
A	FR-A- 998 715 (G.GOURDON) *The whole document*	1,5	
A	DE-B-1 248 606 (EBERSWEIER GmbH) *Column 1, lines 1-6,42,43; column 2, lines 15-32; figure 2*	1,5	
A	DE-U-7 700 629 (NORDISK VERTRIEBS GmbH) *Page 2, paragraphs 2-4; pages 3,4, entirely; claims; figure*	3,4	
A	DE-B-1 084 883 (A.RICHTER) *Column 2, lines 17-23,27-34; figure*	4	A 47 G A 47 C A 41 D
A	FR-A-1 381 484 (P.MAURIANGE & FILS)		
A	FR-A-1 364 437 (MANUFACTURA LANE GAETANO MARZOTTO & FIGLI)		
A	DE-U-7 638 639 (R.BENZINGER)		
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 01-02-1983	Examiner GARNIER F.M.A.C.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
A	DE-A-3 024 713 (N.YOHHIN K.K.) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 01-02-1983	Examiner GARNIER F.M.A.C.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	