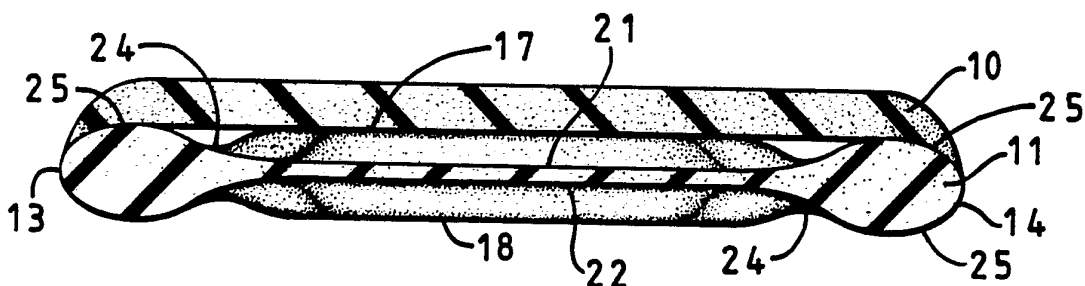




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁵ : A47G 9/00</p>	A1	<p>(11) International Publication Number: WO 91/07122 (43) International Publication Date: 30 May 1991 (30.05.91)</p>
<p>(21) International Application Number: PCT/GB90/01672 (22) International Filing Date: 1 November 1990 (01.11.90) (30) Priority data: 8926022.8 17 November 1989 (17.11.89) GB (71) Applicant: NATIONAL RESEARCH DEVELOPMENT CORPORATION [GB/GB]; 101 Newington Causeway, London SE1 6BU (GB). (72) Inventors: WATTIE, James, Alistair ; WATTIE, Joanna, MacKenzie ; 34 Ratcliffe Road, Stoneygate, Leicester LE2 3TD (GB). (74) Agents: MOSEY, Stephen, George et al.; Marks & Clerk, Alpha Tower, Suffolk Street, Queensway, Birmingham B1 1TT (GB).</p>		<p>(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent). Published <i>With international search report.</i></p>

(54) Title: IMPROVEMENTS IN OR RELATING TO PILLOWS



(57) Abstract

A pillow is of rectangular form and formed by adhering together a top part (10) and a base part (11), the top part being of a softer material than that of the base part. The base part has front and rear rolls (19, 20) at its longer sides and side rolls at its shorter sides (13, 14), upper and lower surfaces (17, 18) of the base having respective large, central recessed areas (21, 22) between the front and rear rolls, the rolls being interrupted by minor recesses (24, 26) extending from respective sides of the pillow into the central recessed areas of the upper and lower surfaces respectively, the front and rear rolls forming on each surface a central main buttress and together with the side rolls forming four corner buttresses (23), side buttresses (25) also being formed between pairs of adjacent corner buttresses (23) respectively, the side buttresses tapering in width and height away from their respective associated sides of the pillow into a central recessed area. The whole of the upper surface of the top part is smooth and its lower surface is adhered to the upper surface of the top part only around their respective perimeters. A large, central void space (34) is defined between the top and base parts in an undeformed state of the pillow.

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IMPROVEMENTS IN OR RELATING TO PILLOWS

This invention relates to improvements in or relating to pillows, particularly pillows formed of deformable moulded rubber or plastics material, and has as its object the provision of a pillow in a convenient and effective form. As used herein, the word 'pillow' includes analogous items, such as cushions.

According to the invention there is provided a pillow comprising a base part and a top part, the base part having respective front and rear rolls, and an upper surface with a large central recessed area between the rolls, the top part having a lower surface adhered to said upper surface of the base part so that in an undeformed state of the pillow there is a central void between said base part and an upper surface of the top part, the whole of said upper surface of the top part being smooth, and the top part being of a softer material than that of the base part.

The term 'large' is used in comparison in surface area with the area of load (head) applied to said upper surface, in use.

Preferably the base part is symmetrical about a mid-plane through said front and rear rolls and in the direction of extent of said rolls.

Conveniently the top part is of soft latex material and is adhered to the base part only around its perimeter.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1A is a generally schematic top plan view of a pillow of the invention, but with the outline of the upper surface of a base part of the pillow also shown,

Figure 1B is a schematic longitudinal, front view of the pillow,

Figures 1C, 1D and 1E are respective schematic cross-sectional views on the lines C-C, D-D and E-E of Figure 1A,

Figure 1F is a schematic side view of the pillow,

Figure 2A, 2B, 2C and 2D are respective schematic front views at four successive stages of stress applied to the pillow,

Figures 3A, 3B and 3C are respective schematic cross-sections on the line F-F of Figure 1 of three successive stages of stress applied to the pillow, starting with the unstressed stage,

Figures 4A, 4B and 4C are respective, schematic cross-sections on the line E-E of Figure 1 for three successive stages of stress applied to the pillow, starting with the unstressed stage,

Figure 5A is a diagram at line E-E showing loads applied at different positions along a top part of the pillow,

Figure 5B is a further diagram at line F-F showing loads applied to said top part of the pillow,

Figure 5C is a fragmentary view of the upper surface of the base part of the pillow showing the various areas defined thereon, and

Figures 6A, 6B and 6C are respective schematic plan, front and side views of an alternative form of pillow of the invention.

The pillow of the first embodiment of the invention (Figs. 1 to 5) is formed in two parts, namely a soft top pad layer or top part 10, and an underpillow or base part 11 of a more rigid material composition. The two parts are adhered to one another, as will be described, and the resultant composite pillow is intended for use as a conventional pillow on which a user's head is directly received.

From Figures 1A - 1F, it can be seen that the base part 11 is of generally rectangular shape in plan, having a straight rear edge or surface 12, shorter straight transverse edges or surfaces 13, 14 respectively, and a front edge or surface 15 which is concave to define a bight 16. The depth of the base part is reduced compared to that of a conventional one-piece top pillow. The base part has generally flat, parallel upper and lower surfaces 17, 18. It is made of soft polyurethane or latex, for example, and is rigid/firmer than the top part 10.

In alternative constructions, the front and rear surfaces could both be straight, or both concave and also one or both of the surfaces 17, 18 could be slightly concave.

The base part has respective front and rear rolls 19, 20, and also side rolls, of generally ovoid shape, i.e. with generally flattened upper and lower surfaces.

Respective, identical, central concave major recesses 21, 22 are formed in the upper and lower surfaces, and the base part is in fact symmetrical about a plane mid-way through it and parallel to its upper and lower surfaces, i.e., through the front and rear rolls. The recesses thus overlie one another in a direction normal to the surfaces 17, 18. Alternatively, the base part can be slightly asymmetric.

The front and rear rolls terminate short of the shorter sides of the base part, each roll tapering convexly from its mid-point to its ends, as shown in Figure 1A. This is the case on both surfaces 17, 18. Similarly on both surfaces 17, 18, four major buttresses 23 are provided at the four corners of the base part respectively, each buttress being convexly curved at its inner boundary in plan view, as shown in Figure 1. Each major buttress gently tapers from its apex so as to be generally dome-shaped.

Between each major buttress and an adjacent front or rear roll is a minor recess 24 which extends from the major recess 21 or 22 to a front or rear surface of the base part. Each recess 24 widens outwardly, i.e. away from the surface of the base part.

Similarly along both shorter sides of the top part, on both its upper and lower surfaces, side buttresses 25 are formed mid-way between the corner or major buttresses. Each side buttress extends inwardly from a side surface, is of generally triangular shape, tapering down away from its side surface, and also towards its adjacent corner buttresses. At its side surface it is at the same level as said corner buttresses, but it slopes towards, and eventually runs into the central major recess 21, or 22.

Between each side buttress and a corner buttress is a further minor recess 26, of similar form to minor recesses 24, extending from the central major recess 21 or 22 to a side surface of the base part 11.

As described, the base part is of similar form to the underpillow described and illustrated in our co-pending U.K. Patent application no. 8927765.1. However, the present invention relates to a conventional pillow formed by adhering a top part suitably to the base part described.

The top part 10 is preferably produced from soft Talalay type latex foam (pinhole latex material) which may be of uniform thickness or have one surface flat and the other gently convex but otherwise smooth. Its thickness can be varied to suit requirements.

The top part 10 is smooth on the whole of its upper surface and should not require any recesses in its lower surface, particularly where the Talalay type of latex foam is used. (The standard approximately 5mm pin holes are not considered recesses).

The top part is preferably only adhered to the base part around its periphery. This adherence should not extend centrally beyond the highest points of the rolls and side/corner buttresses. During the adhesion process, the top part is lightly stretched so that its lower surface remains flat when not under any load and parallel to the horizontal plane of the base pad. This creates a relatively large central air filled void, i.e. the major recess 21 leading into the eight upper surface minor recesses. The top part 10 is extended over the front roll 19 as best shown in Figures 1E and 1F.

The reaction to applied loads of the various parts of the base part, of the top part, and then the complete pillow will now be described.

The recesses of the base part are concerned with supporting loads perpendicular to the horizontal plane of the pillow, and in addition loads acting and moving in planes parallel to the plane of the pillow. A single, central major recess with eight peripheral minor recesses is provided in each of the upper and lower surfaces of the base part. These recesses are concerned with load support and transfer across surface planes of the pillow in conjunction with the top part.

The major recesses 21, 22 gradually reduce in depth towards the front and rear rolls and also towards the lateral sides of the base part by virtue of the varying cross-sectional shape of the central pad of the base part. The major recesses lead into the minor recesses by relatively wide openings which narrow progressively towards the peripheral part of each minor recess in the horizontal plane and also in the vertical plane (due to progressive thickening of the pad in the floor of opposing upper and lower surface minor recesses towards the periphery). Both major and minor recesses progressively widen away from the surface plane of the base part, i.e. they are upwardly (outwardly) widening.

All upper and lower surface recesses narrow towards each other, i.e. towards the horizontal mid plane of the base part. The minor recesses between buttresses and also between rolls and buttresses function synergistically to provide variation in vertical and horizontal load support (cradling) and transfer.

As described previously, the corner and side buttresses have a variable convex shape outwards from the

horizontal plane of the base part, with a gentle taper towards their apex, to be dome-shaped. They thus provide a gradually variable material counterforce to perpendicular loads moving in a horizontal plane. There is synergism of function between buttresses or a buttress and a roll in conjunction with the recesses. Buttresses are gently spread apart by simultaneous perpendicular and horizontal plane loads, so the head and neck are cradled.

Minor buttresses can be defined between a corner buttress and a side buttress, and between a corner buttress and a roll. Each minor buttress has a gentle outwardly convex shape as the base part pad thickness increases towards the base part periphery. The minor buttresses also work synergistically with the major buttresses and recesses to facilitate cradling and reduce the possibility of the user's head moving beyond the peripheral limits of the pillow in use.

Figure 5C shows the various regions of the base part discussed above, with c^1 denoting the central area of the major recess 21, c^2 the central area of the minor recesses 24, 26 and p^2 the highest point of a major buttress or roll.

A load moving in the horizontal plane from A to B will encounter progressively increasing vertical and horizontal plane counterforces by virtue of the narrowing of minor recess c^2 , the main buttresses outline shape and convexity, together with the minor buttress, acting synergistically. Similar counter-forces also act on a load moving in the direction A - C. The possibility of excessive arcuate movements of the head and neck is reduced by the synergistic actions of roll, buttresses and recesses.

Considering a section through a minor recess, e.g. line B - A, there is a gradual increase of 'pad' thickness towards the sides of the base part and also towards the front and rear rolls. This results in base pad counterforces gradually increasing towards the periphery. The major recess areas both have a reducing volume towards both the sides and the front and rear rolls.

The cradling effect of the minor recesses is further enhanced by their opposing configuration. A load applied in the region of an upper surface minor recess will result in depression of the intervening pad and its peripheral portion, viz. the minor buttress, towards the surface of the bed or other supporting surface. Further application of load will result in vertical compression of the pad material itself. The gradual progressive cradling effect of the lower surface minor recess can be further enhanced if it has an asymmetrical shape compared to its opposite surface minor recess. The laterally moving load in such a case has, for example, a relatively greater volume of lower surface minor recess to obliterate, resulting in a more gradual, progressive cradling effect. Similar principles apply to all other recesses, including upper and lower surface major recesses.

The front and rear rolls have a specific shape and function, i.e. the curvature of the front roll/plan view, the straight rear roll and the taper of both rolls from their mid points towards their lateral limits at their junctions with the minor recesses. In plan view the front roll tapers asymmetrically. Only the medial (inner) border of the rear roll tapers. In front elevation the front/rear roll may taper towards its lateral limits symmetrically or asymmetrically.

The rolls provide a progressively reducing counterforce to the head and neck towards their lateral limits, particularly during arcuate movements of the head and neck towards a minor recess. This reducing counterforce is balanced by an increasing counterforce of the centripetal part of the side buttress and then the front buttress. As previously described, cradling of the head and neck occurs by synergism between roll, buttress (front and side) and the minor recesses thus reducing the possibility of the head moving beyond the front or side limits of the pillow, particularly during sound sleep.

With the top part 10 adhered to the base part 11, a load (head) applied to the top part smooth outer surface will initially stretch the pad 10 over its entire surface bounded by the highest points of the rolls and buttresses. The initial load is thus spread over the surface and not confined to a relatively small area immediately in contact with the head. Under further load the soft top immediately below the head depresses to make contact with the base part and now undergoes vertical compression. This occurs along with depression of the base pad towards the bed surface, again by virtue of generally horizontal plane stretching of this firmer type of latex or foam material. Further load results in vertical compression of the base pad. The soft top pad and base pad thus function in a progressive synergistic manner to vertical loads. As it is important to support, but not to restrict horizontal plane movements of the sleeper's head in an undesirable way, the soft top pad should preferably not have recesses on either surface. Similarly the pad comprising the floor of the major recess of the base part should also be relatively smooth.

Figure 5A shows how counterforce to the head gradually increases towards the pillow periphery in a specific variable manner. A load in the central area of

the top part 10 at c^1 will result in generally horizontal stretching fairly evenly around the circumference of the head and so evenly distribute the counterforce. A load at p^1 results in relatively less stretch of the top part 10 on its peripheral side resulting in relatively greater initial counterforce to the head as vertical compression of the top part occurs at an earlier stage together with earlier contact with slope of the roll or buttress, which in turn provides increasing counterforce towards the periphery (i.e. highest point of roll or buttress), in addition to the progressively increasing counterforce of the roll or buttress itself.

At the highest points p^2 only minimal horizontal plane stretch of the soft top part 10 occurs. The load results in virtually vertical compression only, which occurs at an earlier stage than a vertical load at say p^1 . Counterforce to the weight of the head and neck is in addition offered at an earlier stage, in the region of p^2 compared to p^1 by the roll or buttress and to a greater degree by virtue of the greater material thickness at p^2 compared to p^1 .

Figures 5B and 5C show how the top part functions above a minor recess region. The top part is of generally homogeneous material and adhered around the line joining points p^2 i.e. the top part is adhered around the periphery of the base part but not medial to a line joining the points p^2 . An initial load applied to the top part at c^1 will tend to stretch the top part evenly in all directions. As the horizontally moving load nears c^2 (a minor recess) there will be a relatively greater counterforce by the top part, which will be maximal between $p^2 - p^2$ as the top part is relatively fixed between those points and also to their outer aspects. This facilitates the cradling function of the top part which acts synergistically with the upper

surface minor recess and buttress, followed by, as previously explained, obliteration of the lower surface minor recess towards, for example, the bed surface, together with progressive vertical compression of the base part components under load.

The top part 10 can be relatively thin to reduce the overall pillow to a size which will fit in a standard sized pillow case. The upper surface of part 10 retains its soft, smooth and relatively flat surface, essential to user comfort.

Having described how the pillow functions generally under load, specific examples of head and neck movements during sleep and the resultant pillow response will now be described and illustrated.

Figures 2A to 2C show how the pillow responds with a load at line F-F on the left side of Figure 1A, the pillow viewed generally from the front.

Figure 2A shows the unloaded state of the pillow with upper and lower voids 27 at the minor recesses 24 between the front roll and the front side buttress. Figure 2B shows the first stage of load application causing compression and stretching of the top layer into the upper void 27. The third stage, shown in Figure 2C, causes further stretching and compression of the top part 10, together with elimination of the lower void 27 and compression of the base part 11 in the recess area. Finally in Figure 2D, a central load is shown, at line E-E of Figure 1, the load causing compression and stretching of the top part 10 and compression of base part 11 front roll.

Figures 3A - 3C show the functional relationships between the parts 10 and 11 with the pillow viewed from

the side, the load being applied at line F-F. Figure 3A shows the unstressed state, with the top part 10 under slight tension even when not under the load of the sleeper's head. Figure 3B shows compression and stretching of top part to eliminate the void between front and side buttresses at front of pillow. As there is only adhesion of the parts 10 and 11 around their respective peripheries, then when the load is applied, stretching of the top layer can result over a wider area as the void immediately below the head is progressively eliminated. If the top part was mainly adhered to the recessed upper surface of part 11, the void areas would be eliminated prior to any load being applied. Application of load would result in compression of the top part in an axis at right angles to the surface. No significant stretching of the part 10 in its surface plane would occur. The consequences of this would be:

1) A significant proportion of the soft progressive cradling support would be lost as the load of the head would only have the counterforce of the top part immediately under the sleeper's head and would not have the additional counterforce of a wider area (and volume) of the top part material layer.

2) The top part upper surface would no longer be smooth as it would follow the contours of the recessed upper surface of part 11.

3) A thicker top part would be required to achieve a desirable degree of softness for the user. Practical consequences of this would be:

a) An undesirably thick and bulky pillow which would not fit within a conventional sized pillow case.

b) The increased thickness of the top part would result in a greater 'sinking in' in the area of the

sleeper's head, which would impinge on the nose when the sleeper's head was turned sideways.

Figure 3C shows the next stage of loading. Further compression and stretching of the top part occurs. The lower surface void in part 11 is eliminated. The front and side buttresses are now being compressed, including the recessed area between these. The combined effects are to provide progressive cradling and support for the head and neck.

Although illustrated for position F-F, the above principles apply equally to other areas of the pillow.

Figures 4B and 4C are similar to Figures 3A to 3C, but are sections along E-E. Figure 4A shows the unstressed state of the pillow with upper and lower centre section voids 28. Figure 4B shows the first stage of load application, where the top part begins compressing over the front roll 19 and being stretched to begin to fill upper void 28. Figure 4C shows the final stage, with further compression of the top part. The upper void 28 is now almost eliminated, the base part front roll 19 is being compressed, and the lower void 28 is eliminated.

Figures 6A - 6C show an alternative form of pillow of the invention, the difference being in relation to the base part, denoted here as 29, the top part again being denoted by numeral 10. This alternative base part has a recessed upper surface 30 and a non-recessed, flat lower surface 31. It also has less complex contours, thereby overcoming possible technical problems associated with practical limitations of moulding expertise in certain industrial areas or countries. It is known that many commercial moulders of soft polyurethane or latex prefer that one surface is substantially flat and that the

perimeter dimensions are the maximum perimeter dimensions to be found in the product in any horizontal plane level.

The base part has front and rear rolls 32, 33 respectively, the front roll being bowed. A void 34 is formed between the recess in the upper surface 30 and the top part 10.

The overall depth of the base part is similar to that of the base part 11. As a result the upper recessed areas can be of relatively greater depth and so maintain the total volume of the void areas, such that the soft top part will stretch to the degree desired to facilitate compensation for the lack of a recessed surface on the base part underside, and its associated void areas.

CLAIMS

1. A pillow comprising a base part and a top part, the base part having respective front and rear rolls, and an upper surface with a large central recessed area between the rolls, the top part having a lower surface adhered to said upper surface of the base part so that in an undeformed state of the pillow there is a central void between said base part and an upper surface of the top part, the whole of said upper surface of the top part being smooth, and the top part being of a softer material than that of the base part.
2. A pillow according to Claim 1, wherein the central void is between said recessed area and said lower surface of the top part.
3. A pillow according to Claim 1 or Claim 2, wherein there is at least one peripheral surface between said upper surface of the top part and said lower surface of the base part, respective first buttress portions at opposite sides of said recessed area extend to said at least one peripheral surface, a pair of second buttress portions each extend to said at least one peripheral surface and are disposed adjacent to and at respective opposite sides of one of the first buttress portions, being spaced therefrom by respective further recessed areas extending from said central recessed area to said at least one peripheral surface.
4. A pillow according to Claim 3, wherein each first buttress portion has a pair of second buttress portions disposed adjacent thereto at its opposite sides respectively, spaced therefrom by a respective pair of said further recessed areas.

5. A pillow according to Claim 4, wherein between adjacent ones of the two pairs of second buttress portions respectively are respective minor buttress portions.

6. A pillow according to Claim 5, wherein between each minor buttress portion and an adjacent second buttress portion is a minor recess area extending from said central recessed area to said at least one peripheral edge.

7. A pillow according to any one of the preceding claims, which is of rectangular configuration, having longer front and rear peripheral surfaces, and shorter peripheral side surfaces, said first buttress portions being formed by said front and rear rolls respectively which define part of said front and rear peripheral surfaces respectively, each of said front and rear rolls also partly defining at its respective opposite ends said second buttress portions in the form of corner buttresses, each corner buttress being spaced from its adjacent first buttress portion by a further recessed area in the form of a minor recess.

8. A pillow according to Claim 7, wherein respective side rolls of the base part partly define said shorter peripheral side surfaces and partly define said corner buttresses.

9. A pillow according to Claim 8, wherein formed as part of said side rolls are respective minor or side buttress portions, each disposed centrally between corner buttresses of the front and rear rolls respectively.

10. A pillow according to Claim 9, wherein between each side buttress portion and an adjacent corner

buttress is a minor recess extending from said central recessed area to a side surface.

11. A pillow according to any one of Claims 7 to 10, wherein the boundary of each of the first buttress portions with said central recessed area is generally convex in the plane of the pillow.

12. A pillow according to any one of Claims 7 to 11, wherein each of the front and rear rolls is of ovoid transverse cross-section.

13. A pillow according to any one of Claims 7 to 12, wherein the boundary of each second buttress portion with said central recessed area is convex in the plane of the pillow.

14. A pillow according to either of Claims 9 and 10, wherein each side or minor buttress portion is of tapering shape towards the central recessed area, reducing in width, in the plane of the pillow.

15. A pillow according to any one of Claims 9, 10 and 14, wherein the first buttress portions, the corner buttresses and the side buttress portions are all at the same height at the peripheral surfaces of the pillow and all slope towards the central recessed area.

16. A pillow according to any one of the preceding claims, wherein there are central recessed areas in both the upper and lower surfaces of the base part respectively, the central recessed areas being in at least partly overlapping relationship in a direction perpendicular to said surfaces.

17. A pillow according to any one of Claims 1 to 16, in which the base part is symmetrical about a plane mid-way between its upper and lower surfaces.

18. A pillow according to any one of Claims 1 to 17, wherein the base part is symmetrical about a mid-plane passing through said front and rear rolls and in the direction of extent of said rolls.

19. A pillow according to any one of Claims 9, 10 and 14, which is asymmetric about a plane mid-way between its upper and lower surfaces by virtue only of side buttress portions on the lower surface being less wide than side buttress portions on the upper surface respectively.

20. A pillow according to any one of Claims 1 to 19, wherein there are respective first buttress portions on said base part upper and lower surfaces respectively, the lower first buttress portion being of shorter length than the upper first buttress portion.

21. A pillow according to any one of Claims 1 to 15, wherein the base part lower surface is flat.

22. A pillow according to any one of the preceding claims, wherein the top part is of latex material.

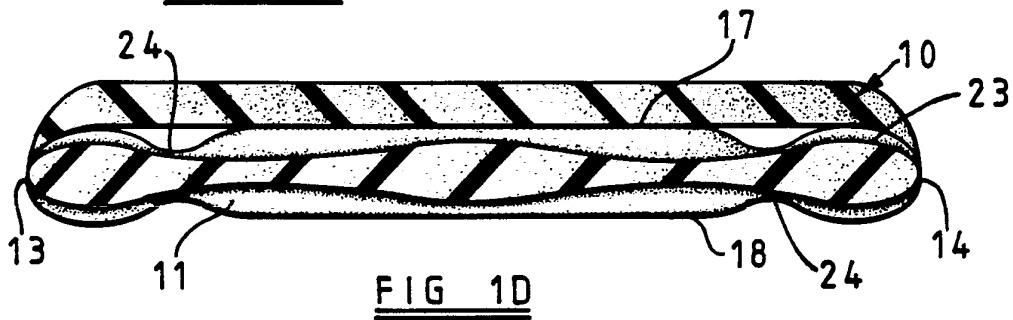
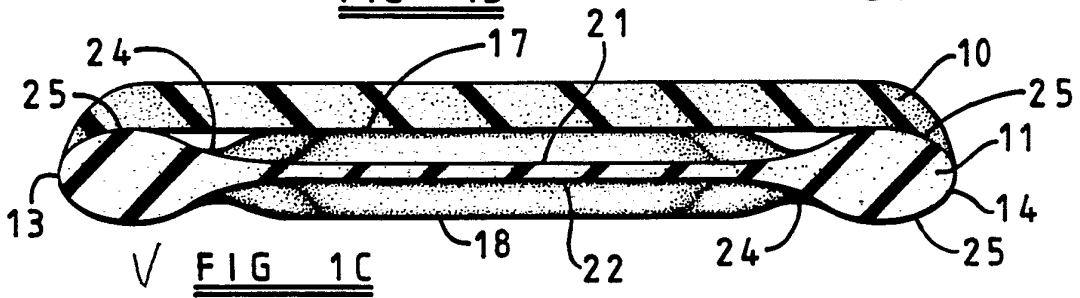
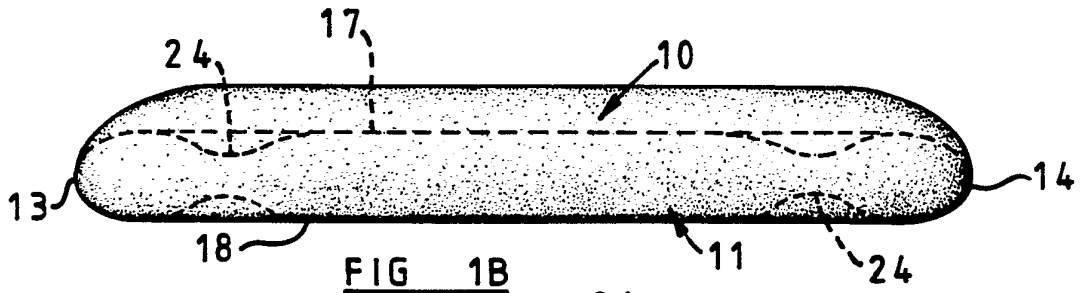
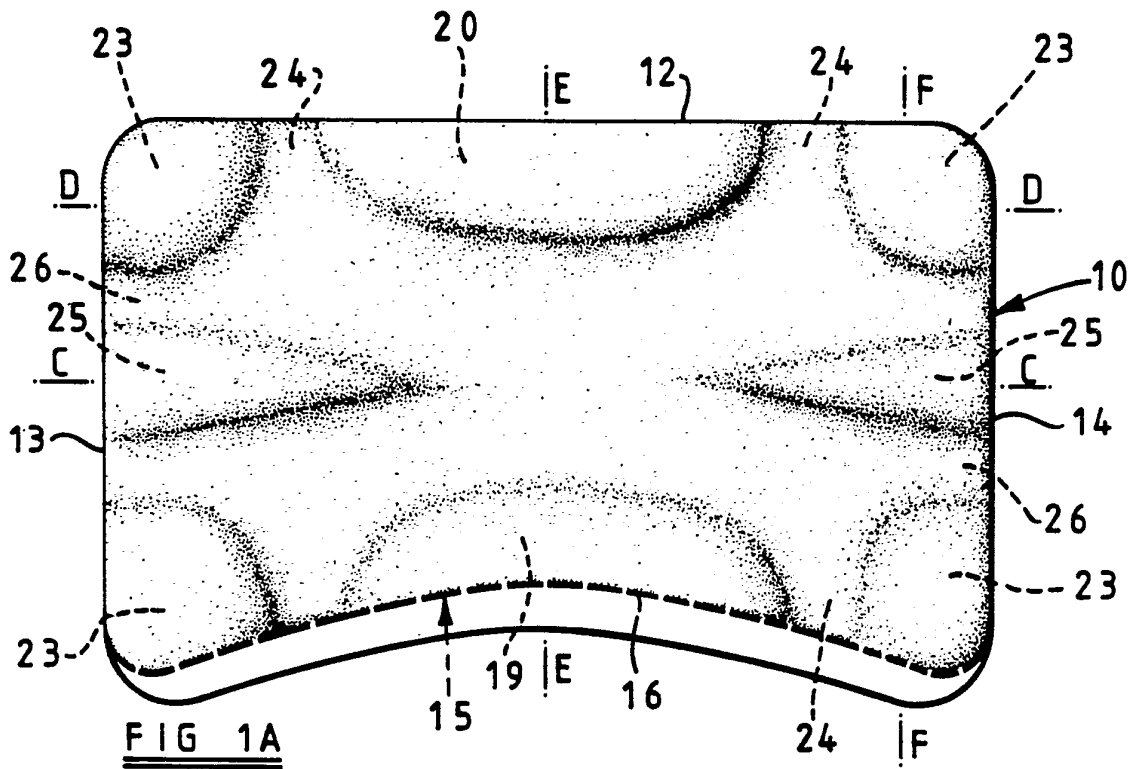
23. A pillow according to any one of the preceding claims, wherein the base part is of latex material.

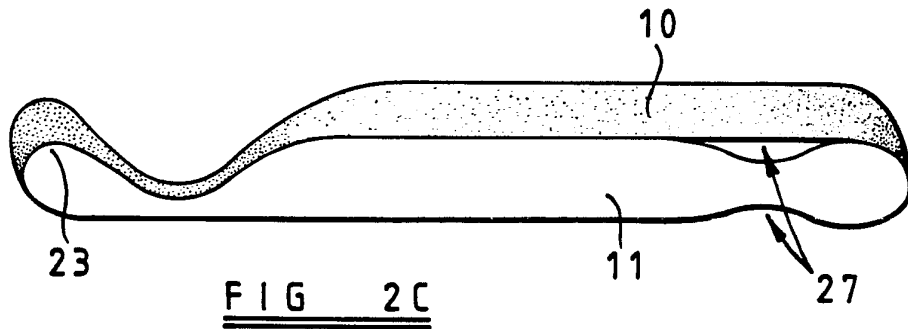
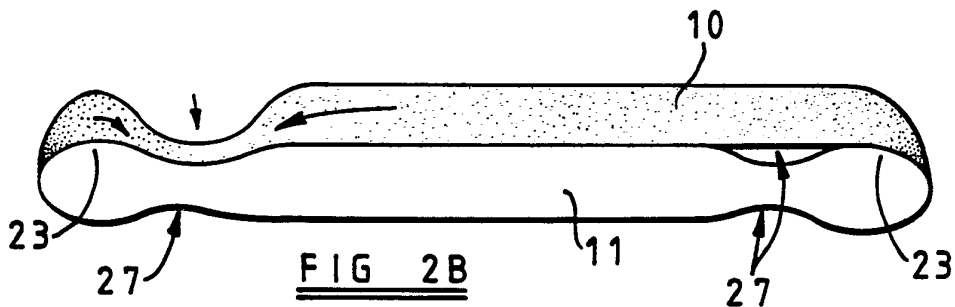
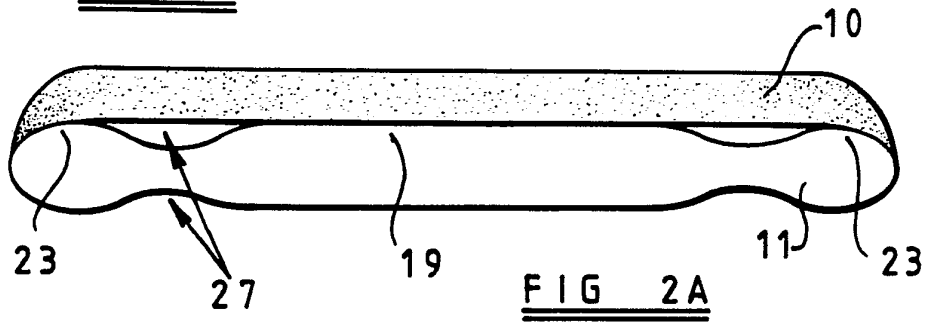
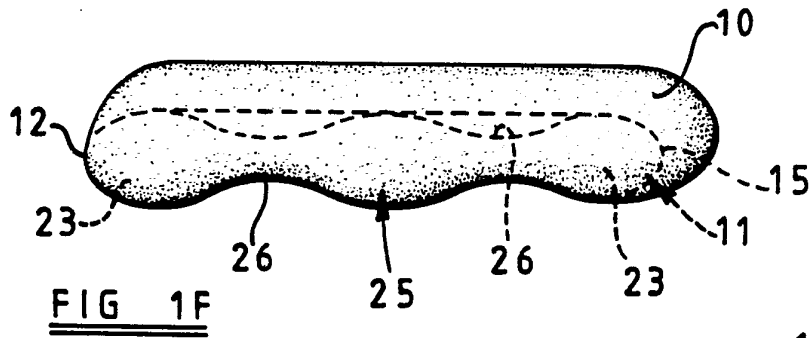
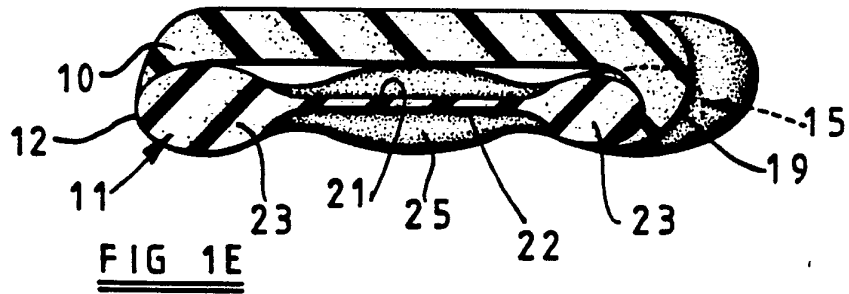
24. A pillow according to any one of Claims 1 to 22, wherein the base part is of soft polyurethane material.

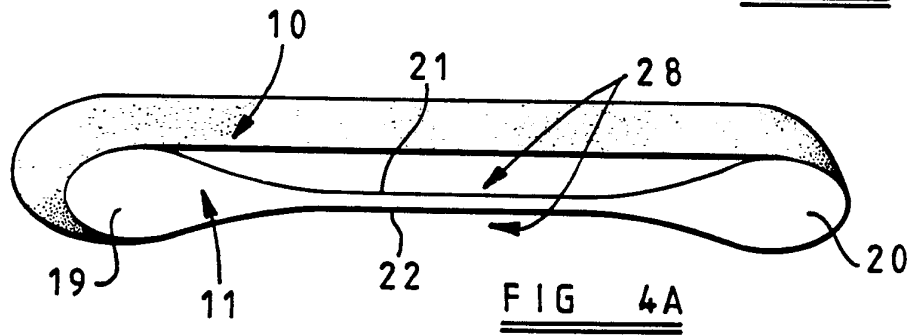
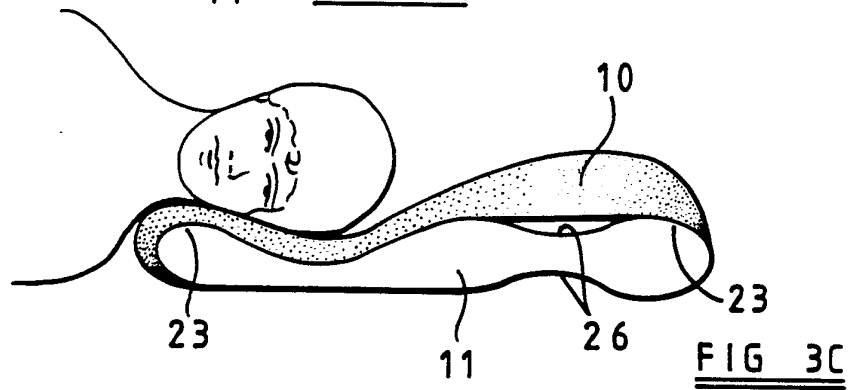
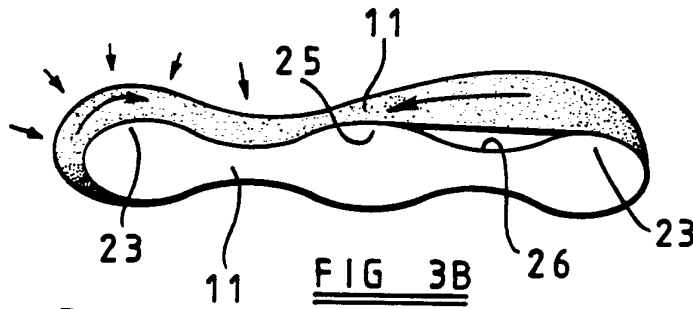
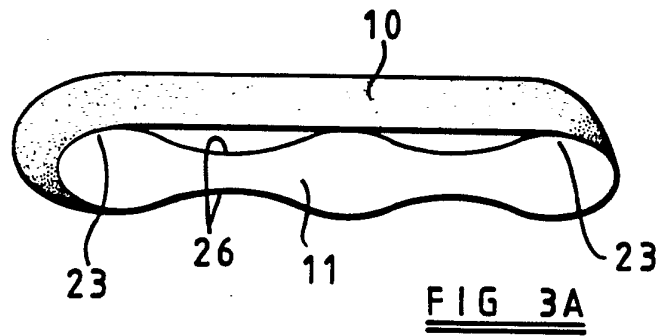
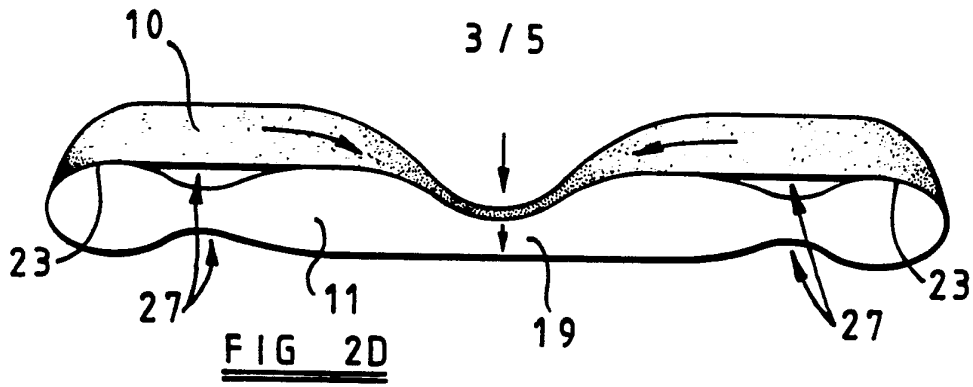
25. A pillow according to any one of Claims 1 to 23, wherein the top part and the base part are adhered together only around their respective perimeters.

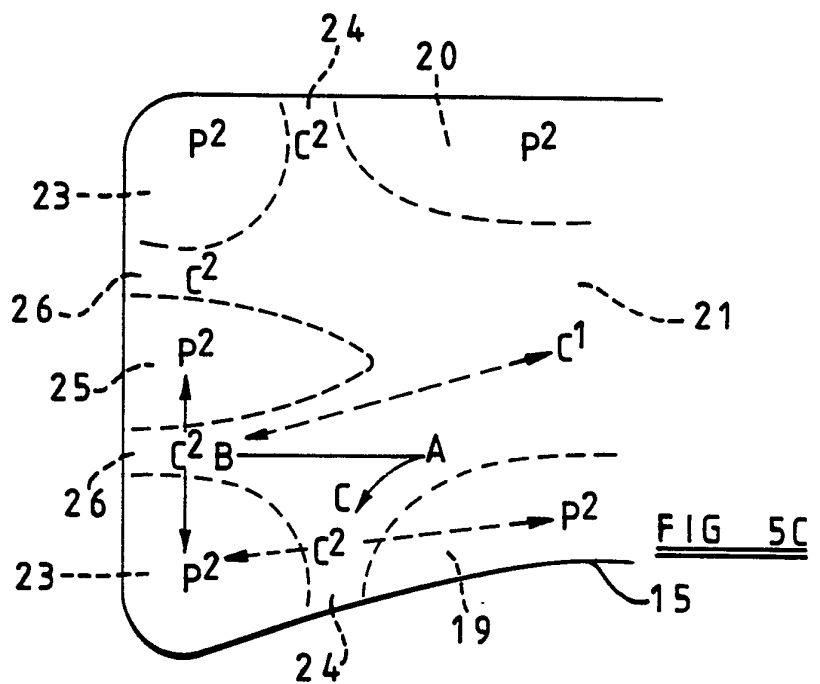
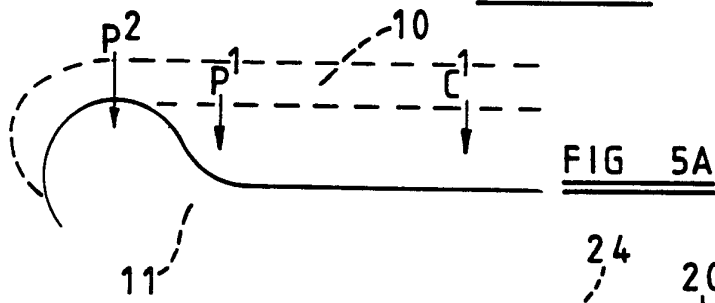
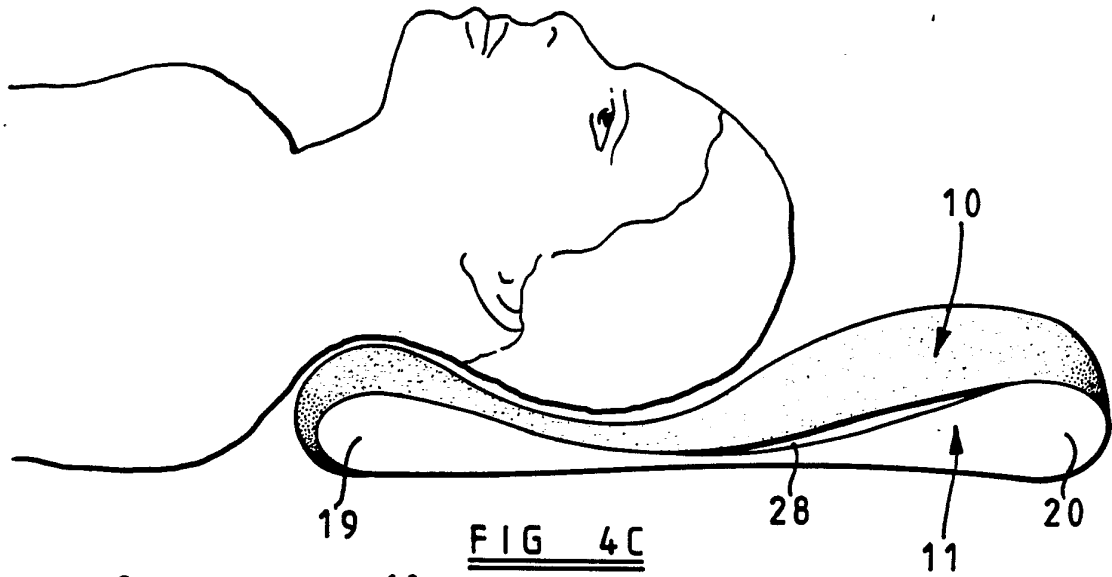
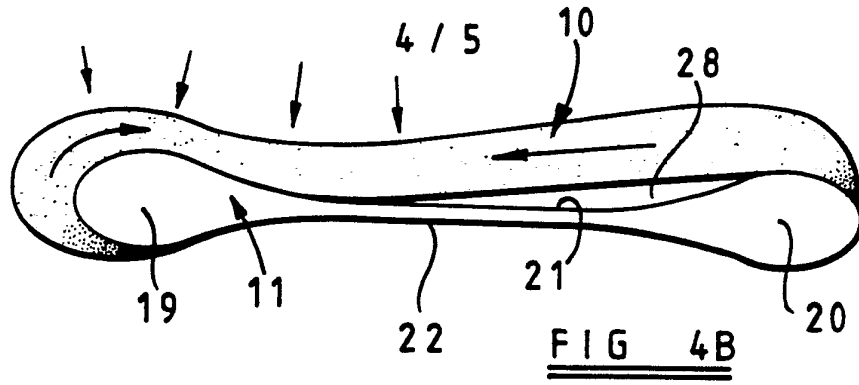
26. A pillow according to any one of Claims 9, 10, 14 and 15, wherein the top part and the base part are adhered together only around their respective peripheries, the adherence not extending centrally beyond the highest points of the front and rear rolls, second buttress portions and minor buttress portions.

27. A pillow according to any one of the preceding claims, wherein in said undeformed state of the pillow said lower surface of the top part is flat.

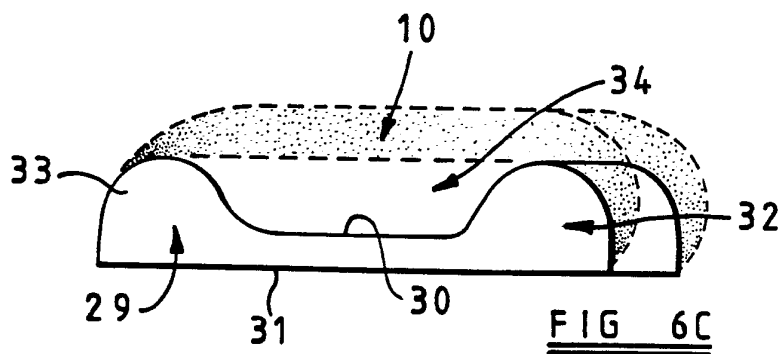
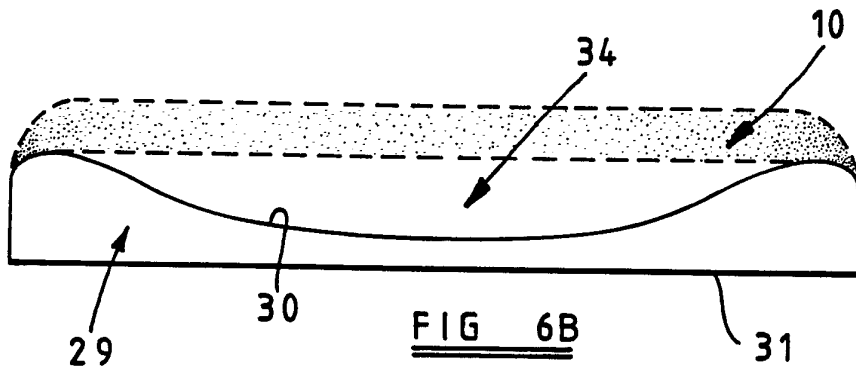
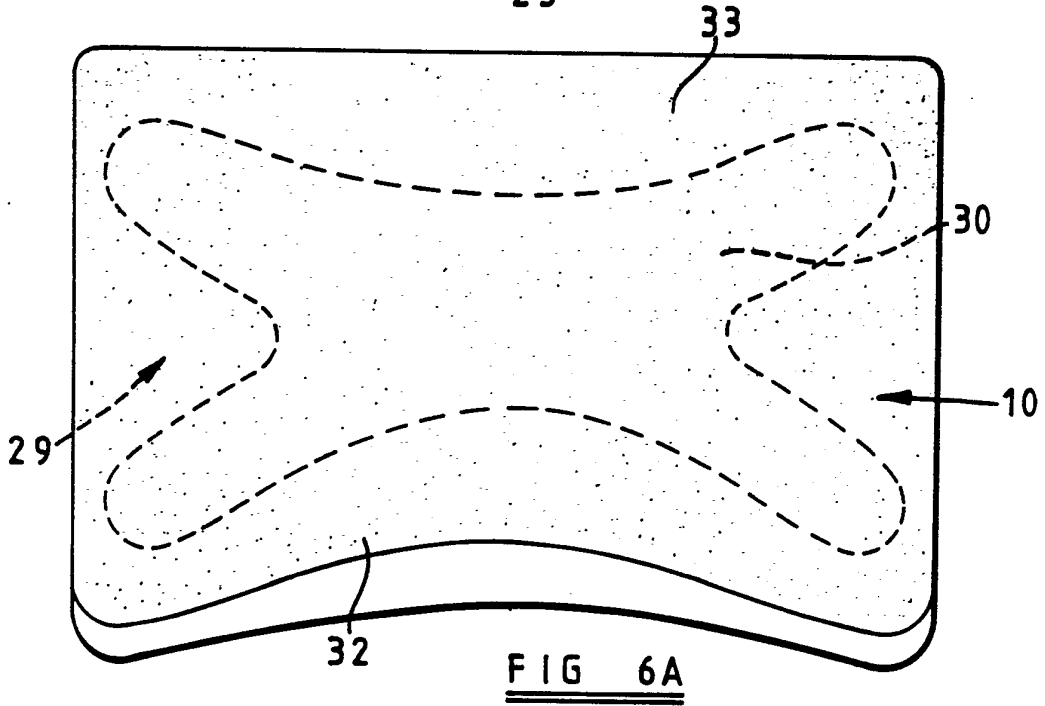
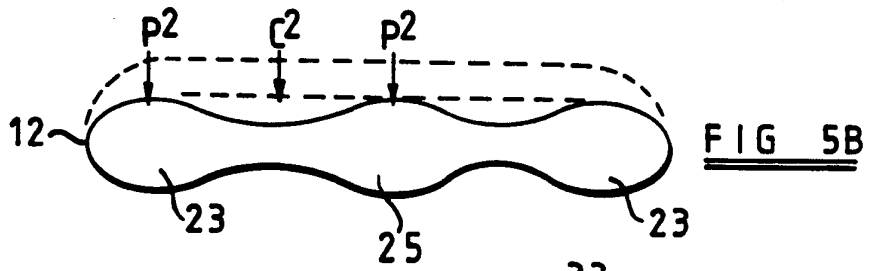








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INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 90/01672

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC5: A 47 G 9/00		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC5	A 47 G; A 61 F; A 61 G	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	DE, C, 233944 (A. SCHONERT) 2 November 1910, see the whole document --	12
X	GB, A, 1216012 (PRICE BROTHERS AND COMPANY LIMITED) 16 December 1970, see the whole document	21-25
Y	--	1
Y	FR, A1, 2305956 (PLASTRE ROBERT ET BROSIO FREDERIC) 29 October 1976, see the whole document --	1-26
<p>* Special categories of cited documents:¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
15th January 1991	18. 02. 91	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	miss T. MORTENSEN	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
X	EP, A1, 0309637 (STEBPDECKENFABRIK KIRCHHOFF OHG) 5 April 1989, see the whole document	21-24
Y	--	1-11
X	US, A, 2944266 (K. WERTHEIMER) 12 July 1960, see the whole document	25,27
Y	--	1,22-24
X	US, A, 3064279 (B FINKLE) 20 November 1962, see the whole document	22-25, 27
Y	--	1
Y	GB, A, 2212391 (JAMES ALISTAIR WATTIE ET AL) 26 July 1989, see the whole document	1,2
Y	--	
Y	EP, A2, 0115320 (WITSCHI-KISSEN AG) 8 August 1984, see the whole document	1-27
Y	--	
P	US, A, 4899405 (ROTHBARD) 13 February 1990, see the whole document	1,2
P	--	
P	WO, A1, 9006708 (NATIONAL RESEARCH DEVELOPMENT CORPORATION) 28 June 1990, see the whole document	1-20
P	--	
P	GB, A, 2228192 (NATIONAL RESEARCH DEVELOPMENT CORPORATION) 22 August 1990, see the whole document	1-20
P	--	

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO. PCT/GB 90/01672

SA 41396

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 28/12/90. The European Patent office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-C- 233944	02/11/10	NONE	
GB-A- 1216012	16/12/70	NONE	
FR-A1- 2305956	29/10/76	BE-A- 866828	01/09/78
EP-A1- 0309637	05/04/89	DE-U- 8713003	26/11/87
		JP-T- 2501277	10/05/90
		WO-A- 89/02713	06/04/89
US-A- 2944266	12/07/60	NONE	
US-A- 3064279	20/11/62	NONE	
GB-A- 2212391	26/07/89	NONE	
EP-A2- 0115320	08/08/84	CH-A-B- 658176	31/10/86
US-A- 4899405	13/02/90	NONE	
WO-A1- 9006708	28/06/90	AU-D- 4748790	10/07/90
		EP-A- 0400134	05/12/90
		GB-A- 2228192	22/08/90
GB-A- 2228192	22/08/90	AU-D- 4748790	10/07/90
		EP-A- 0400134	05/12/90
		WO-A- 90/06708	28/06/90

For more details about this annex : see Official Journal of the European patent Office, No. 12/82