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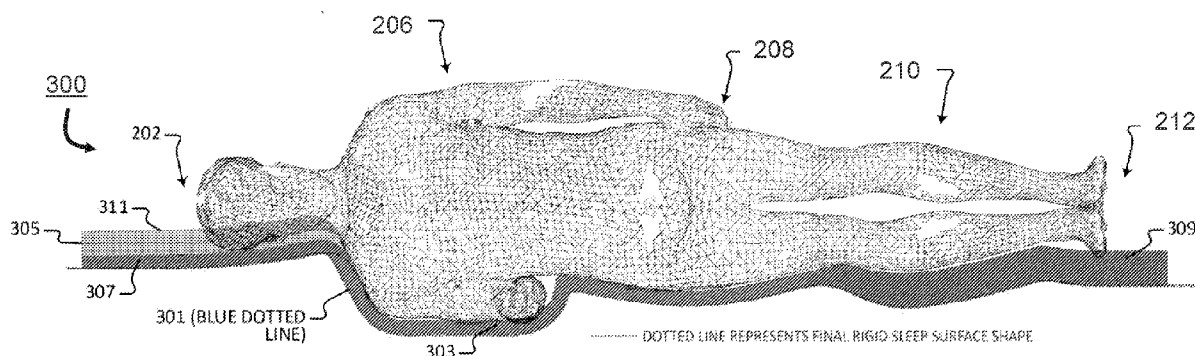
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15 May 2025 (15.05.2025)

(54) Title: CUSTOM CONTOURED SLEEP SURFACE AND METHOD OF MAKING SAME



(57) Abstract: The invention relates to custom beds designed for a specific purpose including features that adapt to the specific position and shape of an individual's body parts to offer relaxation and maintain the person's spine in a neutral position during long-term sleep. The bed comprises a sleep surface silhouette with a contoured shape that matches the unique body surfaces of the person. The silhouette includes various support regions for the head, shoulders, lumbar, legs, and feet. A method for making such a bed involves scanning the body surface of a subject and creating a contoured sleep surface to match. Another method for sleep ensures the spine remains in a neutral position by using a contoured surface that conforms to the subject's body in various sleeping positions.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 24/33145

A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. A47C 31/12, A47C 27/00, A47C 27/08, A47C 27/14, A47C 27/18 (2024.01)

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ADD. A47C 21/048, A47C 21/04, A47C 31/008

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 10,314,407 B1 (XSENSOR Technology Corporation) 11 June 2019 (11.06.2019), entire document, especially Fig 6B, col 1, ln 31-37; col 3, ln 45-60; col 4, ln 19-23; col 5, ln 53-67; col 6, ln 1-39; col 7, ln 49-50; col 8, ln 41-51; col 9, ln 64-65; col 10, ln 43-46	1-7, 9-13
X	US 2017/0156508 A1 (Polar Generation LLC) 8 June 2017 (08.06.2017), entire document, especially Fig 4, para [0015]-[0016], para [0021], para [0025]	1, 8
A	US 2010/0199436 A1 (Schultz) 12 August 2010 (12.08.2010), entire document	1-13
A	US 9,854,922 B1 (Schiller) 2 January 2018 (02.01.2018), entire document	1-13

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"D" document cited by the applicant in the international application

"E" earlier application or patent but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"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

"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 24/33145

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I: Claims 1-13 directed to a contoured bed surface to keep a subject's spine in a neutral position.

Group II: Claims 14-25 directed to a method for making a custom contoured bed surface by scanning a subject's body surface.

Group III: Claims 26-32 directed to a method for keeping a subject's spine in a neutral position while lying down.

- see extra sheet -

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-13

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 24/33145

--- Continuation of Box No. III ---

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

SPECIAL TECHNICAL FEATURES

The invention of Group II includes the special technical features of scanning a unique body surface of the subject; and making a sleep surface silhouette in a contoured surface to match the unique body surface of the subject, not required by the claims of Group I or III.

The invention of Group III includes the special technical features of a method for keeping a subject's spine in a standing spine position or in a neutral spine position when the subject is in a sleep position or when the subject is lying down, the method comprising the steps of: obtaining a surface that is in a contoured shape to conform to a unique body surface of the subject in a lying down position; positioning the surface in a plane that is about at a parallel to a horizontal surface of the Earth; positioning the subject on the contoured shape of the surface such that the unique body surface of the subject makes a contact with the contoured shape of the surface; and whereby the subject's spine is maintained in a standing spine position or in a neutral spine position when the subject is in the sleep position or is lying down, not required by the claims of Group I-II.

COMMON TECHNICAL FEATURES

The inventions of Groups I-III share the technical features of a sleep surface silhouette in a contoured shape that matches one or more unique body surfaces of a subject to keep the subject's spine in a neutral position when the subject is lying down. Specifically, Groups I-III are related as an apparatus (Group I) and methods for making and using the apparatus (Group II-III). The apparatus is known in prior art as shown in US 10,314,407 B1 to XSENSOR Technology Corporation (hereinafter 'XSENSOR').

XSENSOR discloses a sleep surface silhouette in a contoured shape (mattress with contour layer of adjustable air chambers and overlying comfort layer, col 4, ln 17-20) that matches one or more unique body surfaces of a subject (the mattress contour adjusts according to the user's posture, col 3, ln 45-49; detecting the user's posture using machine vision, col 4, ln 41-48) to keep the subject's spine in a neutral position when the subject is lying down (to provide proper spinal alignment, col 3, ln 45-49; col 4, ln 41-48; proper alignment similar to standing, col 5, ln 63-64).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-III lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.