Title: BED SHEET CLASPS

Abstract: A clasp for a bed sheet, the clasp including a plate, the plate defining at least two fasteners for releasably engaging a loop on a bed sheet, and affixing elements for affixing the plate to a portion of a bed, and a method for forming the clasp.
BED SHEET CLASPS
FIELD OF THE INVENTION

The present invention relates to bedding, in general, and, in particular to bed sheet clasps for fitting bed sheets to mattresses.

BACKGROUND OF THE INVENTION

It is a commonly encountered household problem when fitting bed sheets to mattresses, or thereafter, that the sheets slip off the corners of the mattresses and/or become rumpled in the middle due to slippage at the corners. Many solutions have been offered to overcome this problem, including sewing elastic material into the corners of the sheets to cause them to contract around the corners of the mattress. Other proposed solutions include adding clasps or fasteners to the sheet for anchoring them to the mattress.

There is shown, for example, in US Patent 4,488,323 a pair of strips of hook and loop fastening material attached to the side of a mattress with complementary strips on the undersurfaces of the sheets on the mattress. These strips tend to wear out rapidly due to dirt, laundering, and so forth. Another proposed solution, in US Patent 2,284,778, is sewing buttons onto a web of strips placed under the mattress and forming button holes in the sheet.

None of these adequately addresses the problem, especially when taking into consideration newer mattresses, such as innerspring mattresses, which are often substantially thicker than older mattresses consisting of a pad of material.

Accordingly, there is a long felt need for means for holding bed sheets and bed linens taut on a bed, and it would be very desirable if such means were useful at varying levels of tautness or stretching of the sheet.
SUMMARY OF THE INVENTION

The present invention relates to a clasp, preferably of plastic or other resilient material, attached to or integrated into the mattress, bed frame, or other portion of the bed, on or near each of the corners, to which loops coupled to a bed sheet can be removable affixed. The clasp permits the sheet to be stretched tightly over the mattress and retained in that position, and prevents inadvertent release of the sheet from the mattress.

There is provided according to the present invention a clasp for a bed sheet, the clasp including a plate, the plate defining at least two fasteners or hook elements for releasably engaging a loop on a bed sheet, and affixing means for affixing the plate to a portion of a bed.

According to one embodiment, the affixing means affixing means includes a locking plate defining a plurality of apertures for disposing in a portion of a bed, and a plurality of integral spikes disposed on the plate of the clasp, complementary to the apertures, the plate of the clasp being couplable to the locking plate.

The invention also provides a mattress with four corners, the mattress further including a plurality of clasps as described above, one clasp affixed to the mattress at least in proximity to each corner, each clasp including at least one fastener for engaging a loop affixed to a bed sheet and pulling the bed sheet taut across the mattress.

There is further provided, according to the invention, a bed with four corners, the bed further including a plurality of clasps as described above, one clasp affixed to a portion of the bed at least in proximity to each corner, each clasp including at least one fastener for engaging a loop affixed to a bed sheet and pulling the bed sheet taut across the bed. The clasps may be affixed to the mattress of the bed, or to the bed frame, or to any other portion of the bed.

According to one embodiment, the bed is a folding bed and two of the plurality of clasps are mounted in proximity to each folding point of the bed.
There is further provided, according to the invention, a kit for setting a bed sheet on a bed, the kit including a sheet with a plurality of loops, at least one loop in proximity to each corner of the sheet, and a plurality of clasps including at least two fasteners for releasably engaging the loops and affixing elements for affixing the clasps to a portion of the bed.

There is also provided, according to the invention, a method for manufacturing a clasp for a bed sheet, the method including forming a clasp plate having at least two fasteners adapted and configured to releasably engage a loop on a portion of a bed sheet, forming affixing elements for affixing the clasp to a portion of a bed, and coupling the affixing elements to the clasp plate.

According to a preferred embodiment, the method further includes the step of disposing a locking plate defining a plurality of apertures in a portion of a bed and the step of forming affixing elements includes forming a plurality of spikes on the clasp plate complementary to the apertures in the locking plate, the spikes being adapted and configured for locking engagement with the apertures in the locking plate.
BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be further understood and appreciated from the following detailed description taken in conjunction with the drawings in which:

Figures 1a, 1b, 1c and 1d are front perspective, rear perspective, side and detail view illustrations, respectively of a clasp for a bed sheet, constructed and operative in accordance with one embodiment of the present invention;

Figure 2 is a schematic exploded view of a clasp for a bed sheet, according to another embodiment of the invention;

Figure 3 is a schematic illustration of a sheet or other bed linen according to one embodiment of the invention for using on a bed having a clasp according to the invention;

Figure 4 is a schematic illustration of a mattress with a clasp according to one embodiment of the invention;

Figure 5 is a schematic illustration of a folding bed with clasps, according to one embodiment of the invention;

Figure 6 is a schematic illustration of a baby crib with clasps, according to another embodiment of the invention;

Figure 7 is a schematic illustration of a clasp according to a further embodiment of the invention; and

Figure 8 is a schematic illustration of a removable loop, constructed and operative according to one embodiment of the invention, for releasably affixing to conventional sheets.
DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a clasp, preferably of plastic or other resilient material, attached to or integrated into portion of a bed, particularly a mattress or a bed frame, on or in proximity to each of the corners, for engaging loops in the corners of a bed sheet or other bed linen, and holding the sheet taut. The clasp includes at least two, and preferably a plurality of hooks or fasteners adapted to releasably engage a portion of a bed sheet so as to permit engagement of the sheet at different degrees of tautness. Most preferably, the bed sheet includes a loop of elastic, ribbon or fabric sewn into the inside surface or seam (preferably in the overlock) of each corner for releasably engaging one of the hooks when the sheet is on the bed.

Referring now to Figures 1a, 1b, 1c and 1d, there are shown perspective front, perspective rear, side and detail views, respectively, of a clasp 10 constructed and operative in accordance with one embodiment of the invention. As can be seen, in this embodiment, clasp 10 includes a plate 12 which has a column of fasteners 14, here illustrated as hooks or 'teeth', that either protrude minimally or not at all from the plate. In the latter and preferred case, the plate has a substantially smooth surface with indentations 16 or undercut beneath the upper section of each hook. If desired, the clasp may include more than one column of hooks. Preferably, the hooks 14 are bi-directional, or include at least two hooks disposed in opposing orientations, so as to be useable also when the mattress is flipped over onto its other side.

According to the illustrated embodiment, the fasteners 14 extend substantially parallel to plate 12. In this way, the loops on the sheet can be easily looped over the fasteners and easily removed. According to an alternative embodiment, the fasteners define an acute angle relative to the plate, whereby the loops are frictionally engaged or prevented from inadvertently slipping back off of the fasteners.

Clasp 10 further includes affixing means 20 for affixing the clasp to the mattress or bed frame. While the clasp may be a stand alone clasp, bought in sets of...
four, they preferably are incorporated into the mattress or bed frame, itself. For example, the side panels of conventional mattresses are cut separately from the top and bottom panels. When side handles or vents are to be added, they are attached to the side panels before these are applied to the mattress. In the same way, the clasp of the present invention can be affixed to the corners of the side panels before they are sewn with the binding tape to form the finished mattress.

In the embodiment of the invention shown in Figure 1, the affixing means includes a pair of posts 22 with hollow, mushroom shaped ends 24 having axial slits therethrough. A hole is punched through the fabric of the mattress panel and ends 24 are pushed through the holes. A locking ring 28 is provided around posts 22 to retain the ends 24 inside the mattress and prevent them from sliding back through the holes in the panel. A plug 26 is preferably inserted into mushroom shaped ends 24 from the opposite (inside) side of the fabric, causing the slit portions to open outwards, preventing them from pulling out of the locking ring. The fabric panel is then sewn to the other mattress panels to form the mattress.

Figure 2 shows a clasp 30 for a bed sheet, according to another embodiment of the invention. Clasp 30 includes a clasp plate 32 with a plurality of hooks or other sheet fasteners 33 and affixing means 34. In this embodiment, the affixing means 34 include pointed spikes 36, affixed to or integrally formed with the clasp plate 32, and a locking plate 38. Locking plate 38 defines a plurality of apertures 37, complementary to the spikes 36, and is adapted to be disposed in a portion of a bed (e.g., inside the mattress or in the bed frame). The spikes 36 are designed to pierce the fabric panel of the un-sewn mattress (not shown), or protrude from the bed frame, and pass through apertures 37 in locking plate 38. It is a particular feature of this invention that spikes 36 lockingly engage apertures 37 in locking plate 38, thereby preventing them from being pulled back out without ruining the plate and the fabric.

Alternatively, only the plate 38 can be mounted inside the mattress. Then, when and if the owner of the mattress wishes to use a sheet with loops, the plate 32
can be coupled to the plate 38 by pressing the plate so that the spikes 32 pierce the fabric and fixedly engage apertures 37.

It will be appreciated that, alternatively, any other method of affixing the clasps to the mattress or bed portion can be utilized in the present invention. According to one embodiment (not shown), the affixing means is an adhesive layer or glue applied to a flat plate forming the rear of the plate and to the mattress or bed frame. Alternatively, these affixing means can include, but are not limited to, sewing a sewable plastic material, heat welding, staples, rivets, or any other suitable means.

The invention further includes a loop 40 of elastic, ribbon, thread, fabric, leather or any other suitable material, attached to or in proximity to each corner of the bed sheet 42, as shown, by way of non-limiting example only, in Figure 3. Figure 3 is a schematic illustration of a sheet or other bed linen according to one embodiment of the invention for use on a bed having a clasp according to the invention. The loop 40 may be attached at any point, preferably along a corner seam, if present, most preferably at a distance of approximately 10-15 cm from the edge of the sheet, on the 'inside' of the sheet, that is, the side contacting the mattress when the sheet is set on the mattress. It will be appreciated that more than one loop can be provided in or near each corner, to increase flexibility during use. The loop is hooked on one of the hooks or other sheet fasteners on the clasp, as appropriate, in order to achieve a taut and secure setting of the sheet on the mattress. When the bed sheet must be laundered, the loops 40 are released from the fasteners or hooks to which they were coupled and the sheet can be removed from the mattress, as with conventional bed linens.

Referring now to Figure 4, there is shown a schematic illustration of a mattress 50, according to one embodiment of the invention, with four corner clasps 52. As can be seen, clasps 52 are affixed at least at the corners 56 of the mattress, between the top and bottom thereof, e.g., to the side edge panels 54 of the mattress. If desired, one or more clasps 58 can also be affixed in the middle of the side of the mattress.
Various additional designs are inferred as are apparent to one skilled in the art. For example, the clasp can be affixed to areas other than the corners or the mattress. According to a further embodiment of the invention, the clasp may be affixed to the rear of the mattress (for mattresses that are not turned over) or to the frame of a bed, behind the corner. These embodiments are particularly suitable for a folding bed, such as a foldable youth bed or a convertible sofa. In this case, instead of merely mounting such a clasp at the four corners of the mattress, additional clasps are placed adjacent each hinge or fold in the foldable bed.

Figure 5 is a schematic illustration of a folding bed 60 with clasps 62, according to one embodiment of the invention. In this embodiment, a clasp 62 is affixed in proximity to each corner and to each folding point of the mattress 64 on bed 60. Thus, even when the bed is folded and unfolded, the clasps 62 retain the sheet taut across the mattress 64. It will be appreciated that the clasp can be affixed to the outer surface of the corners and the fold line of the mattress, or can be affixed to the bed frame 66 in proximity to the corners and in proximity to the folding points. If the clasp is to be affixed to the bed frame, the clasp can be formed of metal or other relatively rigid material.

Another use for the clasp of the present invention is in baby cribs. Cases of crib death have been ascribed to suffocation of the baby by the bed sheet. Figure 6 is a schematic illustration of a mattress 70 for a baby crib with clasps 72, according to another embodiment of the invention. As shown in Figure 6, clasps 72 according to the invention are affixed to the rear surface 74 of the mattress 76 of a baby crib. Alternatively, in order to permit use of both sides of the mattress, clasps 72 can be affixed to the bottom (outside) surface (not shown) of the crib.

There is shown in Figure 7, a clasp according to a further embodiment of the invention, wherein the affixing means includes a strap with a buckle or ratchet closure. In this embodiment, a tongue strap 80 is sewn to, or extends from, the top seam 84 of the mattress 86. A closure strap 90, including a buckle or one way closure 92, is affixed to or extends from the bottom seam 94 of mattress 86. A clasp 88,
according to any embodiment of the invention, is affixed to closure strap 90. Tongue strap 80 is inserted into the buckle or ratchet closure 92 of closure strap 90 and tightened to the desired degree along the corner of the mattress. This method does not require forming holes in the fabric of the mattress itself, but still permits a taut engagement of the bed sheet on the mattress. Alternatively, the closure strap could be affixed to the bed frame, instead of to the mattress, providing increased flexibility for use. It will be appreciated that the tongue strap could, alternatively, be affixed to the bottom seam of the mattress while the closure strap was affixed to the top seam.

It will be appreciated that, while the invention has been described above regarding hooks on the clasp, that the fasteners in the clasp can be rings, while the loops on the sheet can be replaced by laces or ribbons. In this case, the laces on the sheet will be tied to the rings on the clasp, in order to tighten the sheet on the bed, and untied, in order to remove the bed sheet for laundering.

The embodiments described above all require modification of the bed sheets (i.e., addition of loops or ties) in order to operate with the clasp of the invention. In order to permit the use of conventional sheets, according to one embodiment of the invention, a removable loop is provided for releasably affixing to existing sheets. In this embodiment, illustrated schematically in Figure 8, each "loop" 100 includes a clip 102, such as a toothed or alligator clip used with suspenders or braces, having a ring 104 attached thereto. The jaws 106 of the alligator clip 102 engage a piece of fabric or the corner seam of the bed sheet (not shown), and the ring 104 attached thereto can be releasably affixed to any of the fasteners on the clasp.

While the invention has been described with respect to a limited number of embodiments, it will be appreciated that many variations, modifications and other applications of the invention may be made. It will further be appreciated that the invention is not limited to what has been described hereinabove merely by way of example. Rather, the invention is limited solely by the claims which follow.
CLAIMS

1. A clasp for a bed sheet, the clasp comprising:
   a plate;
   said plate defining at least two fasteners for releasably engaging a loop on a
   bed sheet; and
   affixing means for affixing said plate to a portion of a bed.

2. The clasp according to claim 1, wherein at least part of said affixing
   means is an integral portion of said plate.

3. The clasp according to claim 1, wherein said affixing means further
   comprises a locking element for locking said plate on the portion of a bed.

4. The clasp according to claim 1 or claim 2, wherein said affixing means
   includes:
   a locking plate defining a plurality of apertures for disposing in a portion of a
   bed; and
   a plurality of integral spikes disposed on said plate of the clasp in registration
   with said apertures;
   said plate of the clasp being couplable to said locking plate.

5. The clasp according to any of the preceding claims, wherein:
   the clasp includes a plurality of fasteners, at least two of the fasteners being
   oriented in opposing orientations; and
   each fastener is adapted to releasably engage a loop in the bed sheet.

6. The clasp according to any of the preceding claims, wherein said loop in
   the sheet includes a clip affixed to a ring, said clip being arranged to grip a
   sheet and said ring being adapted to engage one of said fasteners on the clasp.
7. A mattress with four corners, the mattress further comprising:
a plurality of clasps according to claim 1, one clasp affixed to the mattress at least in proximity to each said corner;
each said clasp including at least one fastener for engaging a loop affixed to a bed sheet and pulling the bed sheet taut across the mattress.

8. A bed with four corners, the bed further comprising:
a plurality of clasps according to claim 1, one clasp affixed to a portion of the bed at least in proximity to each said corner;
each said clasp including at least one fastener for engaging a loop affixed to a bed sheet and pulling the bed sheet taut across the bed.

9. The bed according to claim 8, further comprising a mattress, wherein said clasps are affixed to said mattress.

10. The bed according to claim 8, further comprising a bed frame supporting a mattress, wherein said clasps are affixed to said bed frame in proximity to corners of the mattress.

11. The bed according to any of claims 8 to 10, wherein said bed is a baby crib.

12. The bed according to any of claims 8 to 10, wherein:
   the bed is a folding bed; and
   two of said plurality of clasps are mounted in proximity to each folding point of the bed.

13. The bed according to any of claims 8 to 12, wherein said loop includes a clip affixed to a ring.
14. A kit for setting a bed sheet on a bed, the kit comprising:

a sheet with a plurality of loops, at least one loop in proximity to each corner of said sheet; and

a plurality of clasps including:

at least two fasteners for releasably engaging said loops; and

affixing elements for affixing said clasps to a portion of the bed.

15. A method for manufacturing a clasp for a bed sheet, the method comprising:

forming a clasp plate having at least two fasteners adapted and configured to releasably engage a loop on a portion of a bed sheet;

forming affixing means for affixing the clasp to a portion of a bed; and

coupling said affixing means to said clasp plate.

16. The method according to claim 15, wherein said step of coupling affixing means includes integrally forming at least a portion of said affixing means with said clasp plate.

17. The method according to claim 15, further comprising forming a locking element for said affixing means for locking said clasp plate on the portion of a bed.

18. The method according to either of claims 15 and 16, further comprising the step of disposing a locking plate defining a plurality of apertures in a portion of a bed; and

wherein said step of forming affixing means includes forming a plurality of spikes on said clasp plate complementary to said apertures in said locking plate, said
spikes being adapted and configured for locking engagement with said apertures in said locking plate.
INTERNATIONAL SEARCH REPORT

International application No
PCT/IL 10/00112

A CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A47C 21/02; A47G 9/02; A47G 9/04 (2010.01)
USPC - 5/692

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)
IPC(8) A47C 21/02, A47G 9/02, A47G 9/04 (2010 01)
USPC 5/692

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8) A47C 21/02, A47G 9/02, A47G 9/04 (2010 01)
USPC 5/692

Electronic database consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST, PGPB, USPT, EPAB, JPAB, Google Scholar, Google Patents Search terms bedding sheet clasp looped mattress bed fasterener loop web webbing strap hook frame rail foot header clip snap button Velcro prong spike pin needle clamp duvet comforter leg elastic fitted slip-cover bedsheets bedclothing bedcloth

C DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim</th>
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<tbody>
<tr>
<td>X</td>
<td>US 4,662,061 A (Seeman) 05 May 1987 (05 05 1987) col 2 In 7-58, col 3 In 19-25, Fig 1</td>
<td>14</td>
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<td>Y</td>
<td>US 2,057,643 A (Tomsci) 28 October 1958 (28 10 1958) col 1 In 15 to col 5 In 4, Fig 1-4</td>
<td>1-4, 7-12 and 15-18</td>
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<td>Y</td>
<td>US 3,965,504 A (Ainsworth) 29 June 1976 (29 06 1976) col 2 In 14 to col 3 In 24, Fig 1</td>
<td>1-4, 7-12 and 15-18</td>
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<td>Y</td>
<td>US 5,161,276 A (Hutton et al) 10 November 1992 (10 11 1992) col 3 In 44 to col 4 In 4, Fig 1-3</td>
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<td>Y</td>
<td>US 5,002,655 A (Kafai) 02 April 1991 (02 04 1991) col 4 In 25-45, Fig 1</td>
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<td>Y</td>
<td>US 3,538,521 A (Banser) 10 November 1970 (10 11 1970) col 1 In 29 to col 4 In 40, Fig 1-6</td>
<td>12</td>
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Date of the actual completion of the international search
28 May 2010 (28 05 2010)

Date of mailing of the international search report
15 JUN 2010

Name and mailing address of the ISA/JS
Mail Stop PCT, Attn: ISA/JS, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No 773.273.3201

Form PCT/ISA/210 (second sheet) (July 2009)
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 5, 6 and 13**
   - Because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6 4(a)

This International Searching Authority found multiple inventions in this international application, as follows:

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

**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

Form PCT/ISA/210 (continuation of first sheet (2)) (July 2009)