(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 488 968 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **91830520.2**

(51) Int. Cl.[5] : **A47C 23/06,** A47C 23/12

(22) Date of filing : **26.11.91**

(30) Priority : **27.11.90 IT 2219190 U**

(43) Date of publication of application :
03.06.92 Bulletin 92/23

(84) Designated Contracting States :
AT BE CH DE ES FR GB GR LI

(71) Applicant : **STEMA S.a.s. di ZORZETTO Renato & C.**
Via E. Mattei, 9/15
Ronco Briantino (MI) (IT)

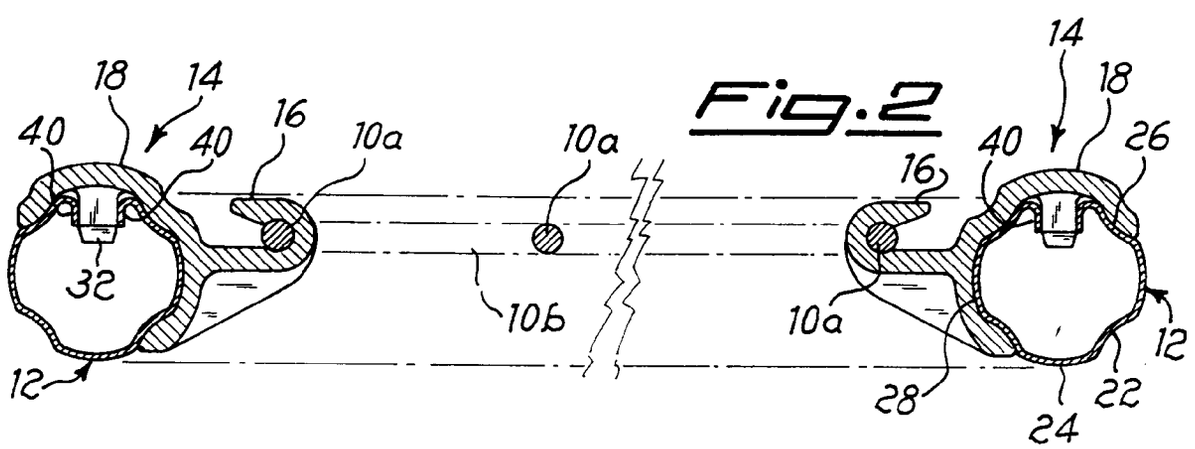
(72) Inventor : **Zorzetto, Renato**
Via S. Francesco, 29
Ronco Briantino (Milano) (IT)

(74) Representative : **Pizzoli, Pasquale et al**
c/o Società Italiana Brevetti Via G. Carducci 8
I-20123 Milano (IT)

(54) Element for fastening the supporting plane, formed either as a bedspring or as a plurality of staves, to a chair-bed orsofa-bed frame.

(57) An element for fastening the supporting plane, formed either as a bedspring (10) or as a plurality of staves (42), to a chair-bed or sofa-bed frame, comprises a first portion (16,44) suitable to be connected with said bedspring (10) or stave (42) and a second portion (18), integral with said first portion (16,44), suited to partially surround and to be applied to the tubular section (12) of which the chair-bed or sofa-bed frame is made. The second portion is internally provided with means (30,32) for its securing to said section (12) suitable to be introduced into a hollow (36) of the section (12) and to snap-fit with the edges thereof.

Fig.2



EP 0 488 968 A1

The present invention deals with an element for fastening the supporting plane, formed either as a bedspring or as a plurality of staves, to a chair-bed or sofa-bed frame.

It is known that the supporting plane of the above mentioned pieces of furniture may, at choice, consist of a bedspring or of staves generally made of wood.

It is also known that a bedspring has been, for a long time, the only means adopted to provide the supporting plane of a chair-bed or of a sofa-bed, while the present tendency, gradually spreading, is to employ staves as therewith the supporting plane, even if having a certain resilience, is sufficiently rigid to give the user a comfort not attainable with the bedspring which, as it is well known, is too yielding.

The bedspring, besides the above mentioned drawback, which is anyhow a subjective factor varying from a person to another, has a further drawback consisting in that its perimetric fastening to the chair-bed or sofa-bed frame has a limited resistance to the stresses.

The above mentioned drawback is caused by the fact that the bedspring is fastened to the chair-bed or sofa-bed frame by means of springs connected at one end to the metal net of bedspring while the other end, properly folded, is inserted into a frame hole.

The supporting plane with staves results to be more resistant, as the end itself of each stave is connected to the frame by sliding therein or by interposition of a connecting element having, on one side thereof, a seat suitable to receive the stave end while on the other side it has an appendix which is secured to the frame usually by means of a rivet or of a screw.

The above mentioned realization results however economically disadvantageous either because of the staves cost or because their mounting, direct or by interposition of said connecting element, involves long preparation works which increase the time necessary to the supporting plane formation.

A further drawback of the realization by means of staves with intermediate element for the connection to the frame consists in that the securing of the element for the connection to the frame results scarcely resistant to the stresses.

Now it has been conceived and is the object of the present invention an element for fastening the supporting plane, formed either as a bedspring or as a plurality of staves, to the chair-bed or sofa-bed frame, which allows to overcome all the above mentioned drawbacks.

In the following, only for the sake of brevity, the reference to the chair-bed or sofa-bed will be simply indicated with "sofa".

The characteristics as well as the advantages of the fastening element according to the present invention will be clear from the following detailed description of a non-limiting embodiment thereof with reference to the attached drawings in which:

Figure 1 is a schematic perspective view of a supporting plane for a sofa with bedspring employing the fastening element according to the present invention;

Figure 2 is a cross section view of the supporting plane taken along line II-II of Fig. 1;

Figure 3 is a perspective view showing the fastening element applied to the supporting plane of Fig. 1 in operating condition;

Figure 4 is a perspective view of the fastening element of Fig. 3 in overturned position to show the securing elements it is provided with;

Figures from 5 to 7 and from 5a to 7a are respectively cross section and lengthwise section views showing the operating steps for applying the fastening element to the sofa frame;

Figure 8 is a schematic perspective view showing a supporting plane formed by staves and employing the fastening element according to the present invention;

Figure 9 is a cross section view of the supporting plane taken along line IX-IX of Fig. 8;

Figure 10 is a perspective view of the fastening element applied on the supporting plane in operating conditions;

Figure 11 is a view of the fastening element of Fig. 10 in overturned position to show the securing means it is provided with;

Figures 12 and 13 and Figures 12a and 13a are respectively cross section and lengthwise section views showing the operating steps for applying the fastening element to the sofa frame.

With reference in particular to Fig. 1 there is seen a sofa supporting plane substantially rectangular but that could be also of different shape.

Said supporting plane comprises a bedspring 10 which is linked to the sofa frame 12 by means of a plurality of fastening elements according to the present invention which are referenced to as a whole by 14.

The frame 12 consists of a metal tubular section whose shape, in cross section, can be seen particularly in Fig. 2. From said figure it appears that frame 12 has a cross section of a suitable shape which, in the considered embodiment, is the one of the tubular section that formed the object of the italian design application N. 21069 B/90 filed on 24.4.1990 by the same applicant. However it should be appreciated that this shape must be considered non-limiting as, although it is a preferred one, it could be different having nonetheless, according to the inventive concept of the present invention, a plurality of recesses and contiguous protrusions suitable to engage respectively with corresponding protrusions and recesses with which the fastening element according to the present invention is provided.

The bedspring 10 is advantageously formed as a net with a first plurality of metal wires 10a extending

lengthwise parallel to each other and a second plurality of wires 10b extending parallel to each other in a transverse direction, which are welded to each other in the points of intersection. The more external wires 10a and 10b of net 10 form the contour thereof and are connected to the fastening element 14 as shown for wires 10a in Fig.2, wires 10b being connected in the same way.

Referring now also to Figs. 3 and 4 there is seen that the fastening element 14 is formed, in a single body of predetermined length, by a first portion 16 for connection with the peripheral wires 10a or 10b of net 10 and by a second portion 18 to be secured on section 12.

The first portion 16 in particular is substantially U-shaped, one side of which extends into the second portion 18 which is substantially C-shaped.

On the bottom of first portion 16 there is obtained a seat 20 for receiving wire 10a or 10b. In cross section it has a substantially circular shape extending along an arc slightly greater than 180° thus holding firmly wire 10a or 10b.

The side 21 of portion 16, which is the upper one in operating conditions, has a thickness decreasing towards its end edge 23 for helping the wire 10a or 10b to fit into seat 20.

The second portion 18 of element 14 has such a shape to cover section 12 almost completely in its upper part with respect to a horizontal median line and partially, for an angle slightly less than 90°, in its lower part with respect to said median line.

In the considered embodiment section 12 has, symmetrically on its contour, four recesses 22 radiused with four corresponding adjacent protrusions 24 as described and illustrated in the above cited italian design application. The internal surface of second portion 18 has correspondingly protrusions 26 and recesses 28 suited to engage respectively into recesses 22 and with protrusions 24 of section 12. This coupling makes particularly stable the securing of the fastening element 14 on section 12.

However it should be noted that section 12 and second portion 18 could have a number of recesses and protrusions different from that above described, or have a different arrangement of them, nonetheless attaining the same object.

Inside second portion 18 there is provided a means for securing the fastening element 14 to section 12 which, according to one of the characteristics of the element according to this invention, is suitable to snap-fit in corresponding hollows formed in said section 12 as more in detail hereunder described.

Said securing means, with reference also to Figs. 5 to 7a, comprises two radial appendixes whose internal side 31 is curved. Each of them ends with a catch 32 directed towards the outside of portions 18.

Between appendixes 30 there is provided a protrusion 34 having a height substantially equal to the one of appendixes 30 and having a cross section which linearly decreases towards its free end.

The whole formed by appendixes 30 and by protrusion 34 is designed to be inserted into a hollow 36 of section 12. The side 31 of appendixes 30 and the catches 32 are suited to snap engage with two opposite edges of said hollow 36 as it results from the following description of the way in which the fastening element 14 is secured to tubular section 12, with reference to Figs.5 to 7a.

In Figs. 5 and 5a the fastening element 14 and the tubular section 12 are represented separated from each other and in particular in Fig. 5a there is seen that appendixes 30 are separated from the opposite walls of protrusion 34.

In Figs. 6 and 6a there is represented the initial stage of the securing of fastening element 14 to tubular section 12 and in particular in Fig. 6a there is seen that catches 32 engage with two opposite edges 38 of hollow 36, inwardly folded and having an essentially curved outline so as to create a slight narrowing of the cross section of hollow 36, such to cause appendixes 30 to bend towards protrusion 34.

Figs. 7 and 7a represent the fastening element 14 and the tubular section 12 locked to each other and in particular in Fig. 7a there is seen that catches 32, once disengaged from said edges 38 of hollow 36, engage with the lower end of edges 38 with a substantially snappy movement due to the fact that appendixes 30, thanks to the resilience of the material the element 14 is made of, can return to their initial position having now their sides 31 engaged with edges 38. The material of which the fastening element 14 is made is plastics and preferably said material is thermoplastic polypropylene.

The stability with which fastening element 14 is locked to tubular section 12 is improved by the engagement of protrusion 34 between the two remaining opposite edges 40 of hollow 36 inwardly folded as shown in particular in Fig.2.

In Fig. 8 there is schematically represented in a perspective view a sofa supporting plane employing staves 42. The element for their fastening to the frame or tubular section 12 is now designated 14a because it differs from the element 14 for the fastening of bedspring 10, merely in two details extraneous to the concepts of the present invention.

The fastening element 14a has in fact, instead of the U-folded portion 16, a hollow appendix 44 adapted to form a seat for the end of stave 42. In addition portion 18 is provided with two groups of securing means, appendixes 30 and protrusion 34, instead of only one, due to the fact that the fastening element 14a will be wider than the fastening element 14.

In Figs.9 to 13a, analogous to Figs. 2 to 7a, there is represented the fastening element 14a in operating conditions, in two perspective views and in the various operating steps of its application to section 12. Its

detailed description as well as that for the application to section 12 are omitted being identical to those relating to the fastening element 14. In Figs. 9 to 13a the same elements of Figs. 2 to 7a are indicated with the same reference numbers.

From the above it clearly results which are the advantages deriving from using the fastening element according to the present invention, the main of these advantages being the readiness and simplicity of its application, the stability of locking the same onto the frame and therefore of the whole supporting plane.

Claims

1. An element for fastening the supporting plane, formed either as a bedspring or as a plurality of staves, to a chair-bed or sofa-bed frame, characterized by the fact of consisting essentially of a first portion (16,44) suitable to be connected with said bedspring (10) or stave (42) and of a second portion (18), integral with said first portion (16,44), suitable to partially surround and to be applied on the tubular section (12) forming the chair-bed or sofa-bed frame, said second portion having internally means (30,32) for its securing to said section (12) and suited to be inserted into a hollow (36) of the section (12) and to snap-fit with the edges (38) thereof.

2. A fastening element according to claim 1 characterized by the fact that said means for securing the second portion (18) to the tubular section (12) comprises at least a pair of appendixes (30) radially extending inside said portion (18), and provided at their end with a catch (32), the distance between said appendixes being slightly greater than the width of the hollow (36) thus causing, during the insertion of said appendixes (30) into the hollow (36), at first a mutual approaching thereof and, once the insertion is accomplished, their moving apart with simultaneous snap engagement of the catches (32) with the edges (38) of the hollow (36).

3. A fastening element according to claim 2 characterized by the fact that the edges (38) of the hollow (36) with which the catches (32) engage are bent inside the tubular section (12) with a substantially curved shape.

4. A fastening element according to claim 2 characterized by the fact that between the appendixes (30) there is provided a protrusion (34) with cross section decreasing towards its free end thus allowing the temporary approaching of the appendixes (30) during their insertion into the hollow (36).

5. A fastening element according to claim 1 characterized by the fact that the second portion (18) is internally provided with protrusions (26) and recesses (28) suitable to engage respectively with recesses (22) and protrusions (24) of the tubular section (12).

6. A fastening element according to claim 3 characterized by the fact that, once the insertion of the appendixes (30) into the hollow (36) is accomplished, the protrusion (34) of the second portion (18) engages with the two remaining opposite edges (40) of the hollow (36).

7. A fastening element according to claim 1 characterized by the fact that the first portion (16) has a substantially U-shape in the bottom of which there is formed a seat (20) suitable to receive a peripheral wire (10a or 10b) of the bedspring (10).

8. A fastening element according to claim 7 characterized by the fact that the seat (20) has, in cross section, an essentially circular outline extending for an arc slightly greater than 180°.

9. A fastening element according to claim 7 characterized by the fact that the side (21) of the first portion (16), defining the passage for the wire (10a or 10b) of the bedspring (10) for its insertion into the seat (20) has an outline with decreasing thickness towards its free edge.

10. A fastening element according to claim 2 and 3 characterized by the fact that the external side of the appendixes (30) has a shape complementary with respect to that of the bent edges (38) of the hollow (36).

Fig.1

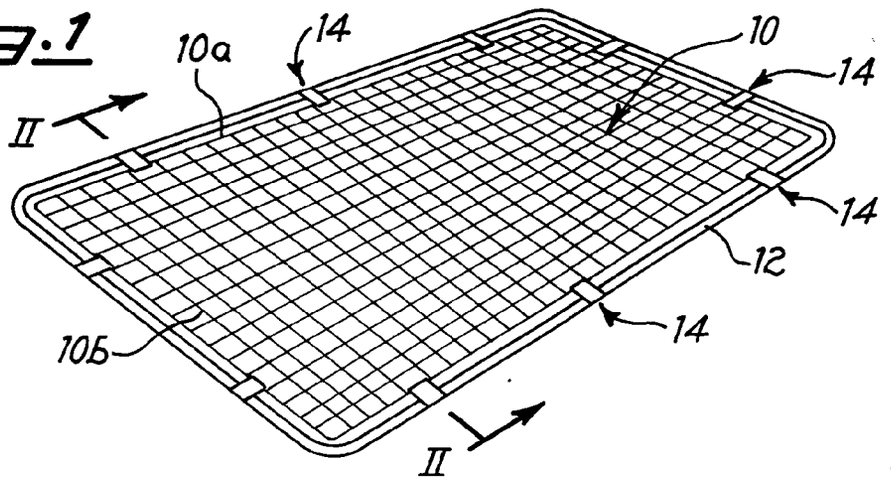


Fig.2

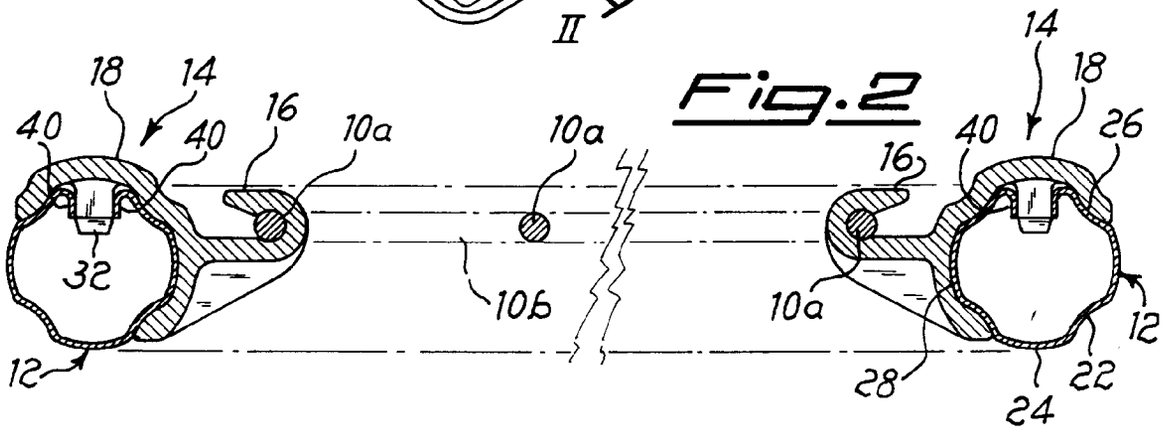


Fig.3

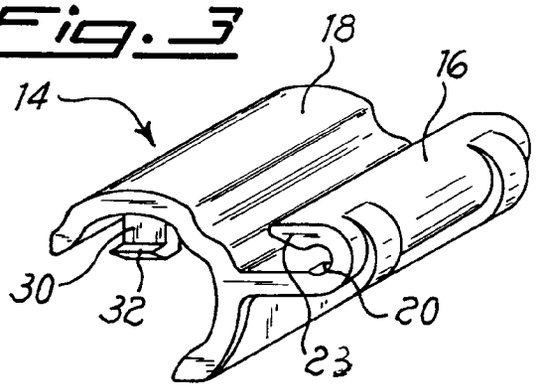
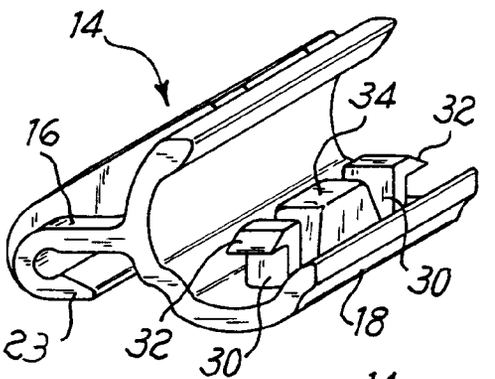


Fig.4



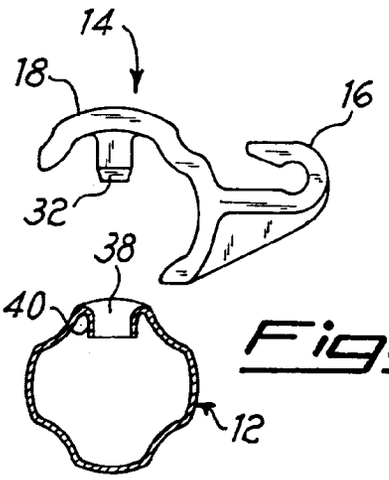


Fig.5

Fig.5a

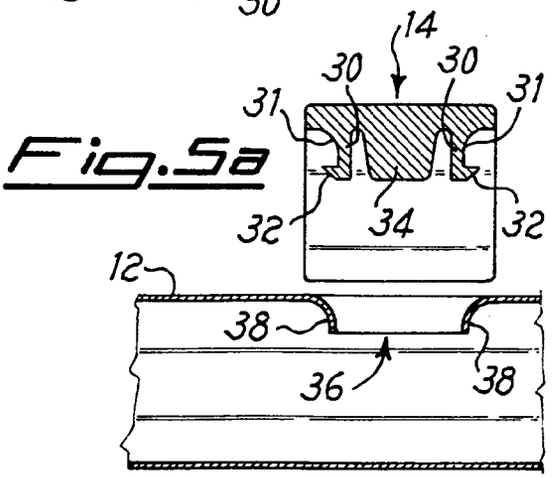


Fig.6

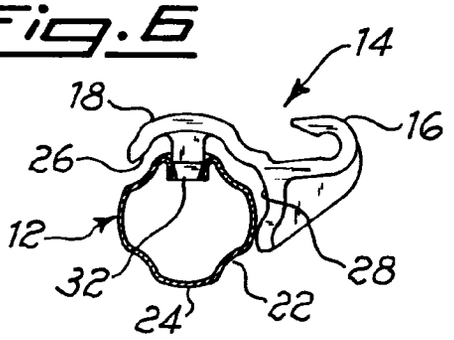


Fig.6a

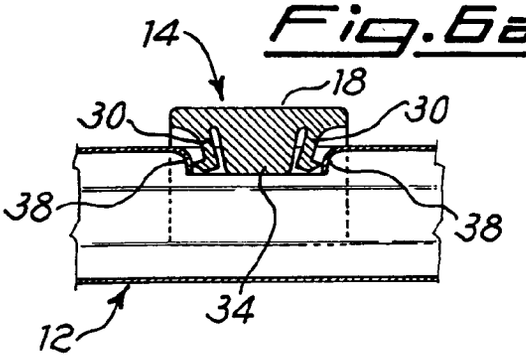


Fig.7

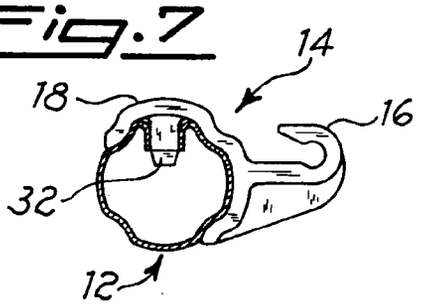


Fig.7a

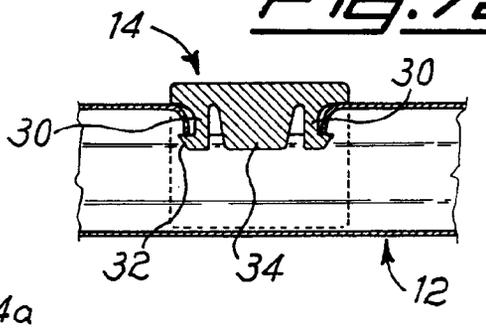


Fig.8

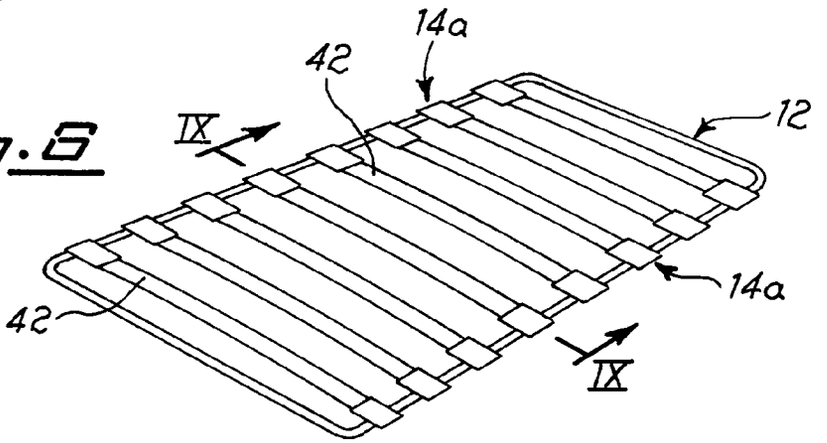


Fig.9

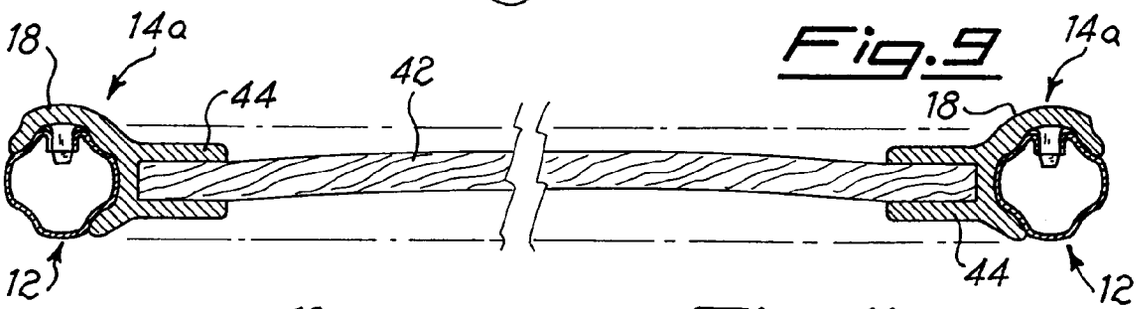


Fig.10

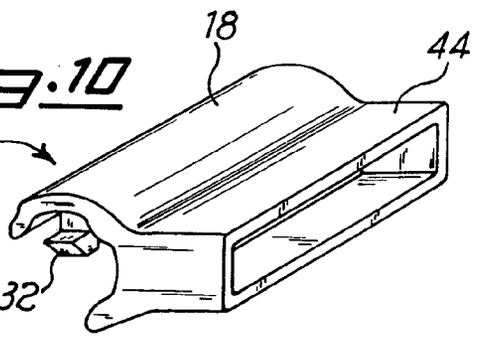


Fig.11

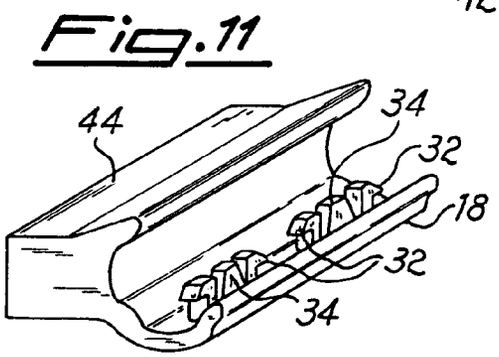


Fig.12

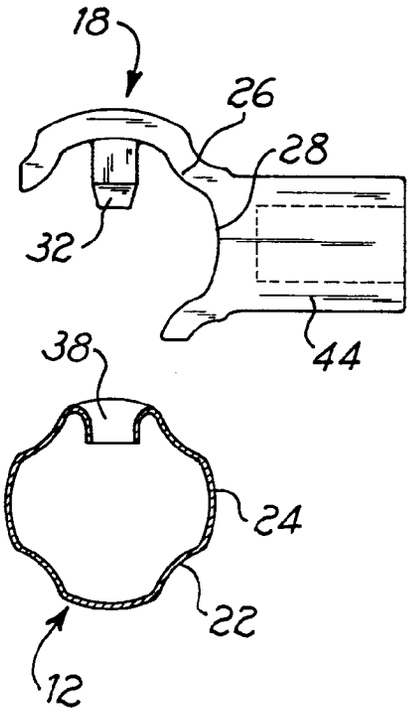


Fig.12a

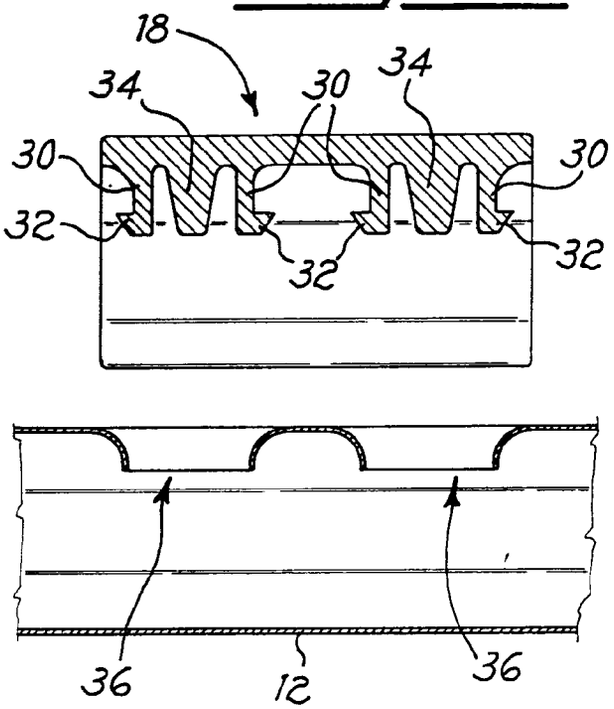


Fig.13

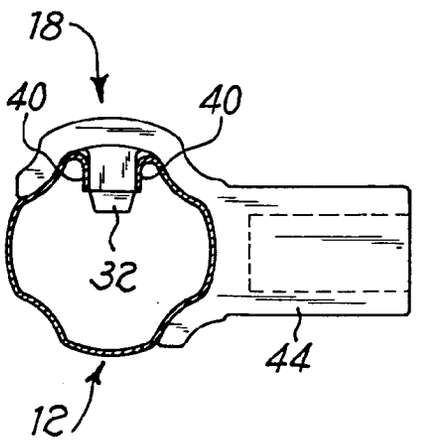
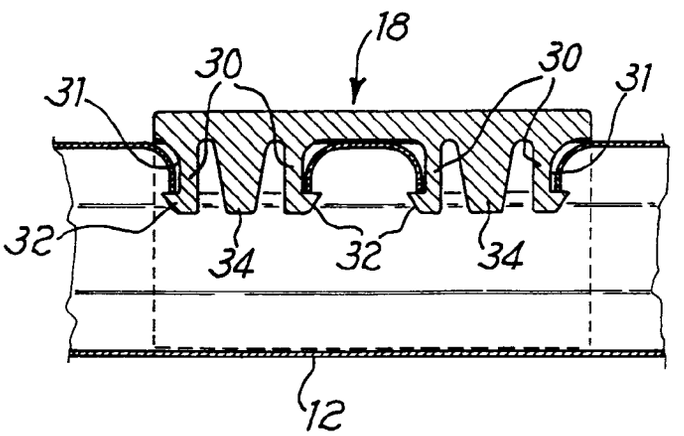


Fig.13a



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 83 0520

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.5)
X	DE-B-1 916 630 (ROBERT KAHL)	1,2	A47C23/06
Y	* column 4, line 27 - line 58 *	7	A47C23/12
A	* column 5, line 3 - line 44 *	8	
Y	US-A-3 802 005 (ARNOLD ET AL.) * figures 5,6 *	7	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A47C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	06 FEBRUARY 1992	mysliwetz

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

EPO FORM 1503 03.82 (P0401)