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(71) Applicant: ONDAFLEX S.p.A.
Via Largo Antonelli, 4
I-00145 Roma(IT)

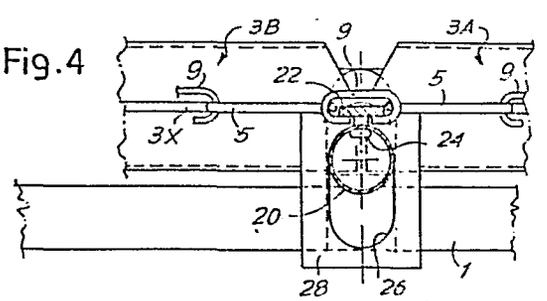
(72) Inventor: Pofferi, Giancarlo
Frazione Guamo Località al Torrione
I-55012 Capannori (Lucca))(IT)

(74) Representative: Mannucci, Gianfranco, Dott.-Ing.
Ufficio Tecnico Ing. A. Mannucci Via della Scala 4
I-50123 Firenze(IT)

(54) Bed net with articulated frame and with mobile bar associated to the net springing system.

(57) To the springing system made up of undulated cross springs anchored at an articulated frame, a cross-piece is engaged that is, a bar in the region or of one, or of each articulation; the cross-piece has a limited freedom degree relative to the net perimetrical frame, whereby it can lower but cannot lift above the frame.

Fig.4



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DESCRIPTION

The invention relates to bed nets or the like, of the type which is equipped with one or more cross articulations to achieve an inclination of the couch formed by the net springing system. The object of the invention is to avoid deformations onto the surface of the couch formed by the spinging system, in the inside of the articulations, deformations which appear mostly as convexities upwards on the cross profile of the couch surface and in the form of rises in the centrale longitudinal zone of the couch in the springing systems made up of undulated cross springs.

For the above purposes it is provided to engage to

the springing system of the net a cross-piece, that is, a bar in the zone of the articulation, or of each articulation, said cross-piece or bar having at least a certain freedom degree relative to the net perimetrical frame.

Advantageously, the bar may be engaged to the springing system in the intermediate zone of the bar length, without being connected to the springing system towards its ends.

Advantageously, the bar reaches by its ends the structure of the perimetrical frame to which it engages in the arrangements of relative inclination of frame parts, so that the bar is prevented from projecting above the lying planes of the frame parts articulated between them. The contrast may occur against hooks lip.

Preferably, the bar is located in correspondence of the respective articulation. The bar ends may be constrained in such a way as to be able to move in practice only along a line approximately at right angle to the mid lying plane of the net frame, for example, along fissures or slots even slightly wider than the bar cross-section, which can be formed by wings, that is, ears, integral with one of the parts between them articulated of the net frame and, particularly, to the part which does not tilt, or even to the underlying support frame.

One bar or cross-piece may be engaged to the springing

system by using the hooks connecting the undulated springs which extend transversally, that is, parallel to the articulation, the engagement being possibly achieved by a hook which embraces the cross-piece or bar, or by wings of the bar engaging the hooks.

To ensure a correct arrangement of the springing system, in correspondence of the articulation apt to define an upwards convexity, a bar is engaged to the springing system up to a limited distance of the articulation hinges, in order to allow for a downward elastic subsidence of the springing system; besides, means are provided to limit the spacing of the bar from hinges, especially a bush of molded plastic material, from which bush an eyelet develops, mostly flexible, which embraces the corresponding end of the bar in order to limit its moving away from the articulation axis.

The invention will be better understood by following the description and the accompanying drawing which shows a practical, non limitative, exemplification of same invention. In the drawing:

Fig.1 shows a perspective view of a bed with two parts (bedhead and bedfoot) apt to be raised angularly;

Figs.2, 3, 4, 5, 6 and 7 show a cross view according to II-II of Fig.3 and views and cross views according to III-III, IV-IV, V-V, VI-VI, VII-VII of Fig.2;

Figs.8 and 9 show two modified embodiments respect to Fig.4;

Figs.10 and 11 show a plan view and a side view of a bed net frame having sections articulated between them;

Fig.12 shows an enlargement of a detail indicated by the arrow XII of Fig.10;

Fig.13 shows a cross view according to XIII-XIII of Fig.10;

Fig.14 shows an enlargement of a detail of the part indicated by arrow XIV of Fig.13;

Fig.15 shows an enlargement of a detail indicated by the arrow XV of Fig.10;

Fig.16 shows a cross view according to XVI-XVI of Fig.15; and

Fig.17 is similar to Fig.16, but shows the members in a different arrangement.

According to what is illustrated in Figs.1 to 7, of the drawing, referring first to Fig.1, by 1 a frame is designated for supporting the bed net, while the bed net has one frame of its own in three parts: one part 3A forming the bedhead; one part 3B forming a central section fixed to the frame 1, and one part 3C forming the bedfoot. The two parts 3A and 3C are apt to be variously raised from the lying plane parallel to the lying plane of frame 1 and thus relative to the part 3B.

Referring now also to Figs.2 to 7, it will be seen that the springing system is made up of a plurality of springs 5, with undulated wire in one plane, and transversally arranged, hooked to the longitudinal lengths of frame portions 3A, 3B, 3C by means of hooks 7 and each connected to the adjacent springs by means of hooks 9. The outer springs are hooked, by small helical springs, to the frame transverse sides 3A, 3B, 3C. The springs 5 make up a springing system typical of the owner production.

As shown in the drawing, every section of the part 3B is engaged to the support frame 1 at least through two brackets, at least one of them, designated by 10, forming also an articulation hinge of one of the mobile parts; in the drawing, the mobile part 3A; brackets 10 are, for example, welded to the frame 1. The converging ends of the frame parts 3A, 3B to be articulated to the support bracket 10, have articulation ears 12, 14, respectively, which arise from the inside of the tubular section forming the frame portions 3A, 3B, this section having an inner lip 3X for the hooking of the hooks 7. The pivot for the brackets 10, 12, 14 articulation is designated by 16 and may be riveted or otherwise engaged. The articulation axis between parts 3A and 3B of the springing system frame is transversal, since it is defined by pivots 16 located in alignement and opposite to each other onto the net.

To said axis a zone of the springing system corresponds where a cross-piece is applied, which prevents an upwards springing system curvature in the inclination arrangement of part 3A relative to part 3B. In the drawing, the zone of the articulation axis defined by the pivots 16 corresponds to a space between two adjacent springs 5 and, thus, to a space in which hooks 9 connecting the two springs are aligned.

According to Figs.2 to 7, a bar or tubular cross-piece 20 is located below the springing system and is engaged with hooks 9 in an intermediate zone of the springing system width, except for the end lengths. In the drawing, the bar or cross-piece 20 is engaged to the hooks 9 through a flat slat 22 which is connected to the bar or cross-piece 20 through rivets or welding 24 and which is engaged to the springing system being embraced by hooks 9. In this way springs 5 in the articulation zone defined by pivots 16, are prevented from bending upwards by the bar or cross-piece 22 which is engaged to hooks 9; the springs may instead warp downwards as allowed by their end lengths which are not engaged to the cross-piece 20, 22.

The bar or cross-piece 20 can be engaged with its ends into the slots 26 formed in relevant wings 28 welded at one of two parts 3A, 3B, and in particular at the part 3B which does not tilt. In this way, the ends of the bar

or cross-piece 20 may lower by downwards springing system, deformation but cannot raise bejond the boundary imposed by slots 26, below the axis 3X of the frame 3A, 3B, 3C; thus, when the part 3A is inclined, the bar 20 stops itself against the upper bottom of slots 26 and prevents the springs from arching upwards in the articulation zone. On the contrary, the springing system may sink down by sliding along slots 26. More simply, the bar ends can only make contrast with lips or wings 3X without needing a guide.

In Fig.8 a bar 120 is shown similar to that indicated by 20, which, however, is engaged by hooks 109 similar to those indicated by 9 but embracing the bar or cross-piece 120 to engage it in the lower part.

In Fig.9 a modified embodiment is shown of the bar which is supported by a T-shape section 220 having its wings engaged in the lower part by the ends of hooks 9.

According to Figs.10 to 17, numerals 51, 53, 55 and 57 indicate traditional components of the springing system which is anchored, by hooks 57 and others equivalent, to the inner lips 60 of a structural shape 62 some sections of which are used to form the frame with the articulated sections of the springing system. With this frame, a solid and stiff counterframe 64 may be combined for supporting the frame in its stretched arrangement. Numeral 65 indicates

arched cross-pieces which form strengthening struts. The frame formed with the structural shapes 62 comprises more sections A, B, C, E which are hinged between them by articulations 66, 68 and 70 according to the transversal axis through which said sections A, B, C, E may be mutually inclined - as indicated with A1, C1, and E1 in Fig.11 - depending on the therapeutical and comfort requirements of the user. Articulations 66 and 68 allow the formation of concavities turned towards the patient, whereas the articulation 70 allows the formation of a convexity turned towards the patient.

The articulations 66, 68 are made in a similar way as those provided in the previous example in order to achieve a limitation of the upwardly deformations of the springing system in the relative inclination arrangement and to consent a springing system subsidence in the full springing condition. To this purpose (see Fig.12), the articulations like that designated with 66 have a pawl appendix inside, like 74 or 76 of the articulation 68, against which a bar or cross-piece 78 rests, said bar being engaged to the springing system 51, 53 remote from the ends which come in contact with the pawl appendixes 74 or 76; for the engagement, a flat slat 80 may provided which is engaged to the bar 78 through rivets 82 or the like; to said flat slat 80 some of the hooking bridges 53

are engaged which are located between the adjacent springs 51. The bar 78 may be tubular and may have a recess 79 at each end, such as is provided also for an equivalent bar 84 which extends in correspondence of the articulation 70; the bar 84 has also a recess 86 at each ends. The recesses 79 are provided to contact with the appendixes 74, while the latter may be properly lined to avoid noise. The support relationship and the interference between the ends of bars 78 and appendixes 74 and 76 prevent the springing system from projecting upwards in the concavity arrangement formed by the relative inclination along the articulations 66 and 68, in the arrangement of relative inclination shown in Fig.10 with A1 and B and with C1 and B respectively.

The sections C and E of the frame may be mutually inclined to form a upwards convexity like shown in the arrangement C1, E1, obtainable for the presence of the articulation 70. Also in correspondence of this articulation there is provided the bar 84 engaged to the springing system at a distance from the ends. The bar 84 is engaged to the springing system through hook-like bridges 53 and a slat 85 up to a certain distance from the frame. The bar 84 must be susceptible of limited downward displacements only to avoid that in the arrangement of relative inclination between sections C1 and E1, an

excessive lowering of the springing system takes place in the zone of the articulation 70. To this aim, one internal appendix 70A of each articulations 70 is coated with a flexible material layer 90 forming a bush to which a flexible eyelet 92 is combined which is injection molded together with the bush 90 and capable of deflecting from a tension stressed arrangement, as shown in Fig.17, to a flexed arrangement as shown in Fig.16. The bush-like part 90 serves for the contact with the recess 86 of the corresponding end of the bar 84, in the coplanar arrangement of sections C and E; yet the bar 84 may move away from the bush 90 through the deformation of the springing system under the limited load of the user's weight portion which weighs down on the net length where the user lies with his legs; the lowering of bar 84 is limited by the extension of the eyelet part 92. When the two sections C and E are inclined relative to each other (as shown in Fig.17), the springing system tends to lower in a marked way respect to the articulation axis 70, 70A; this lowering is limited by limiting the spacing of bar 84 from appendixes 70A, for the presence of the eyelets 92; said eyelets, in fact, limit the displacement of bar 84 ends respect to the articulation axis 70.

The presence of the components made of flexible plastics 90, 92 ensures noiselessness during each

displacement or each contact. The spacing of bar 84 from the appendixes 70A may take place either in vertical direction or in a direction slightly inclined towards the directrix of the angle formed by the two sections C and E.

It will be understood that the drawing shows only an exemplification given as a practical demonstration of the invention, as the invention may vary in the forms and dispositions without departing from the ambit of the idea on which it is based. It is possible, for example, to provide a single mutual articulation axis for the two parts A and C, both inclinable, of a frame with net.

C L A I M S

1. A bed net with springing system made up of undulated cross springs anchored at an articulated frame, characterized by the fact that below the net springing system there is engaged a cross-piece, that is a bar in the zone or of one, or of each articulation, said cross--piece or bar having at least a certain freedom degree relative to the net perimetrical frame, in order to lower but not to raise respect to said frame.

2. A bed net according to claim 1, characterized by the fact that the bar, by its ends, reaches the structure of the perimetrical frame with which it makes contrast, in the conditions of relative inclination of

the frame parts in such a way that the bar is prevented from projecting above the lying planes of the frame articulated parts.

3. A bed net according to claims 1 and 2, characterized by the fact that the bar is engaged to the springing system at the intermediate zone of the bar lenght, without being connected to the springing system towards the ends, in order to allow downward elastic subsidences of the springing system.

4. A bed net according to claims 1 to 3, characterized by the fact that the bar is located in correspondence of the respective articulation.

5. A bed net according to claims 1 to 4, characterized by the fact that the ends of the bar are constrained by guide means in such a way as to be able to shift only along a line approximately perpendicular to the lying plane of the fixed part of the net frame; said guide means being possibly made up of fissures or slots formed out from wings, that is, ears integral to the frame part which remains horizontal to the underlying support frame.

6. A bed net according to claims 1 to 4, characterized by the fact that the bar or cross-piece is engaged to the springing system by using the hooks connecting two adjacent undulated springs and extending transversally,

that is parallel to the articulation; the engagement being possibly accomplished by hooks embracing the cross-piece or bar, or by bar wings which are engaged to the hooks.

7. A bed net according to claims 1 and 2, characterized by the fact that in correspondence of the articulation able to define an upwardly directed convexity, the bar is engaged to the springing system up to a limited distance from the articulation hinges, to consent a downward elastic subsidence of the springing system; and that means are provided to limit the bar spacing from the hinges.

8. A bed net according to claims 7, characterized by the fact that the hinges of said articulation have a projection lined with a bush of molded plastic material, from which bush an eyelet - preferably flexible - develops which embrace the corresponding end of the bar, in order to limit its moving away from the articulation axis.

9. A bed net according to claims 7 and 8, characterized by the fact that the bar is tubular and has at each end a deformation which forms lowerings and with which the bar end comes in contact through the bush of the respective projection.

10. A bed net according to claims 1 to 9, characterized by the fact that also with the articulations, in

correspondence of which there are formed concavities upwardly directed, tubular bars are engaged analogous to the above described bar and similarly engaged to the springing system.

11. A bed net made up of a plurality of sections relatively inclinable in opposite directions; all as described and illustrated.

Fig.1

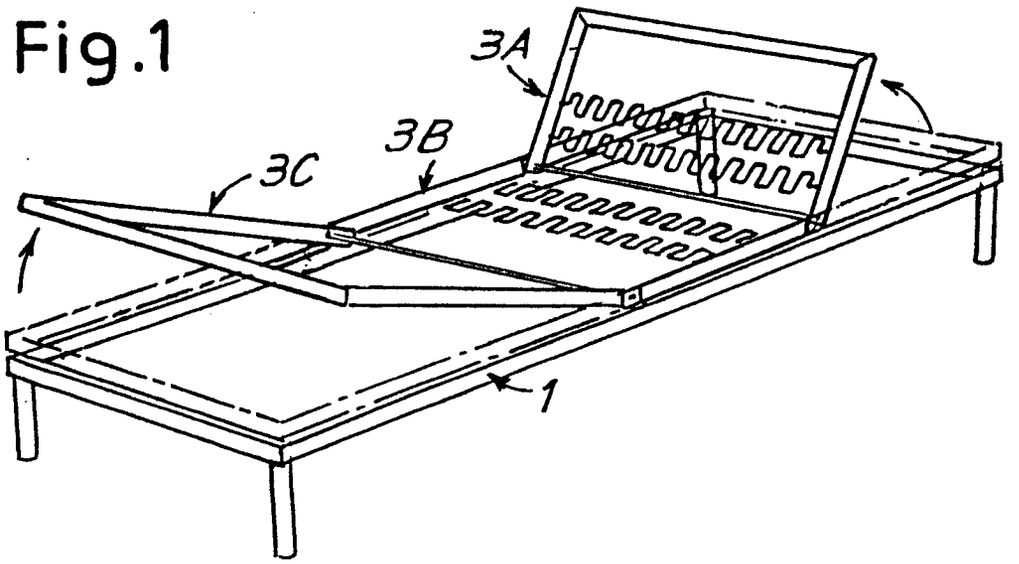


Fig.3

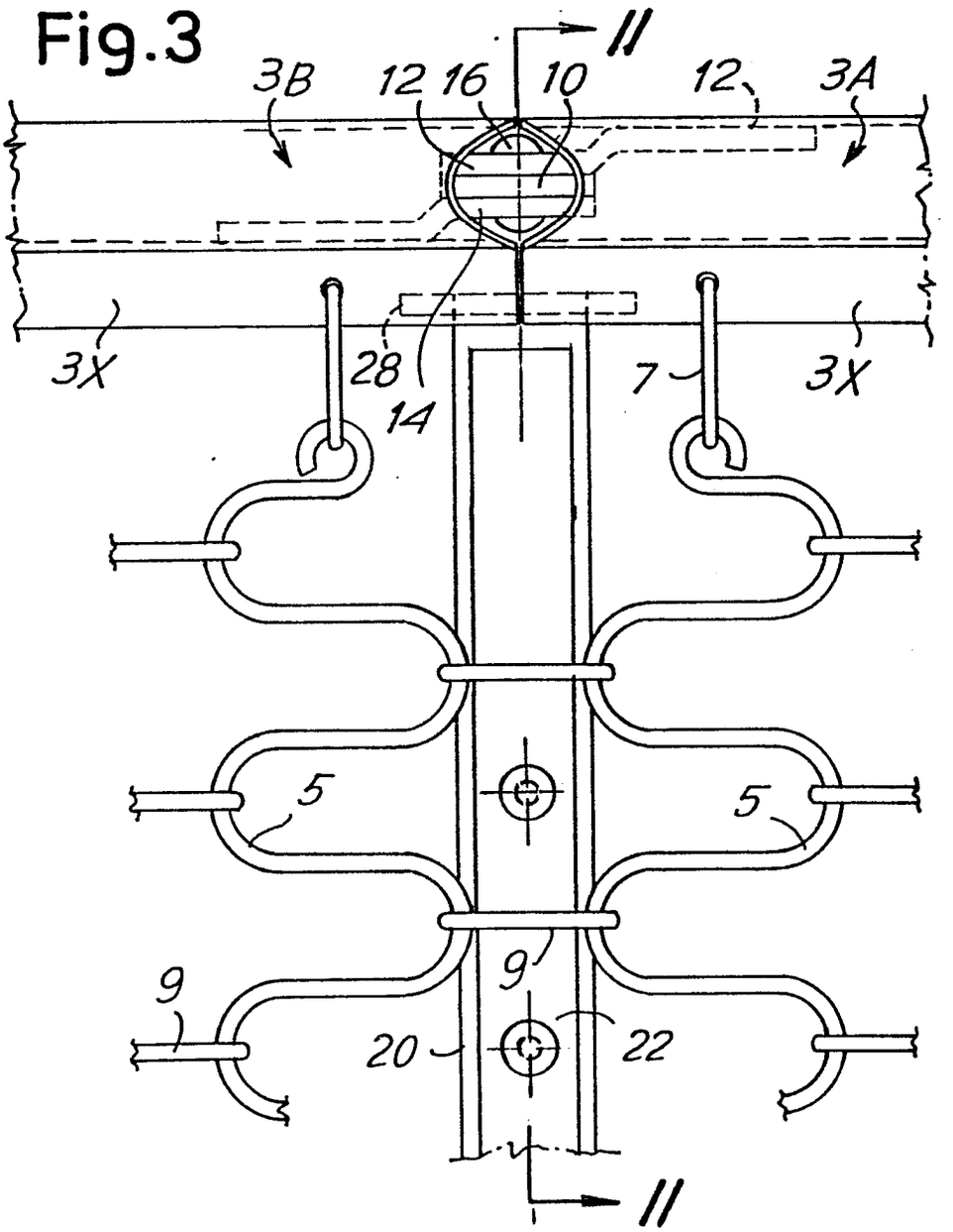


Fig.2

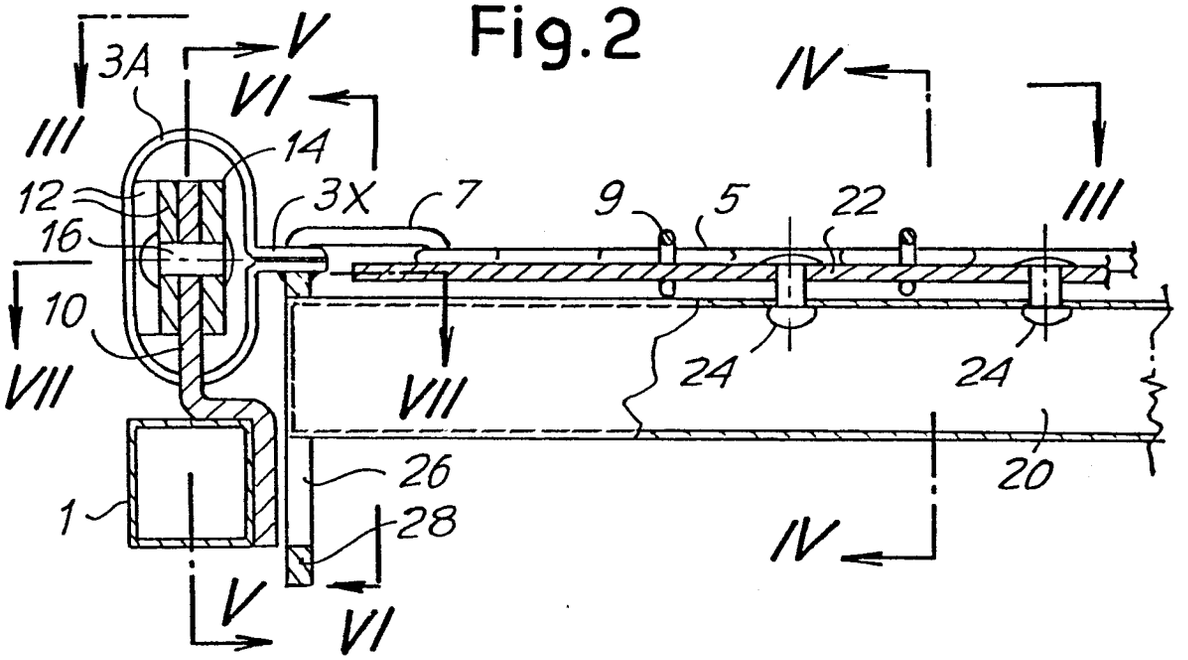


Fig.4

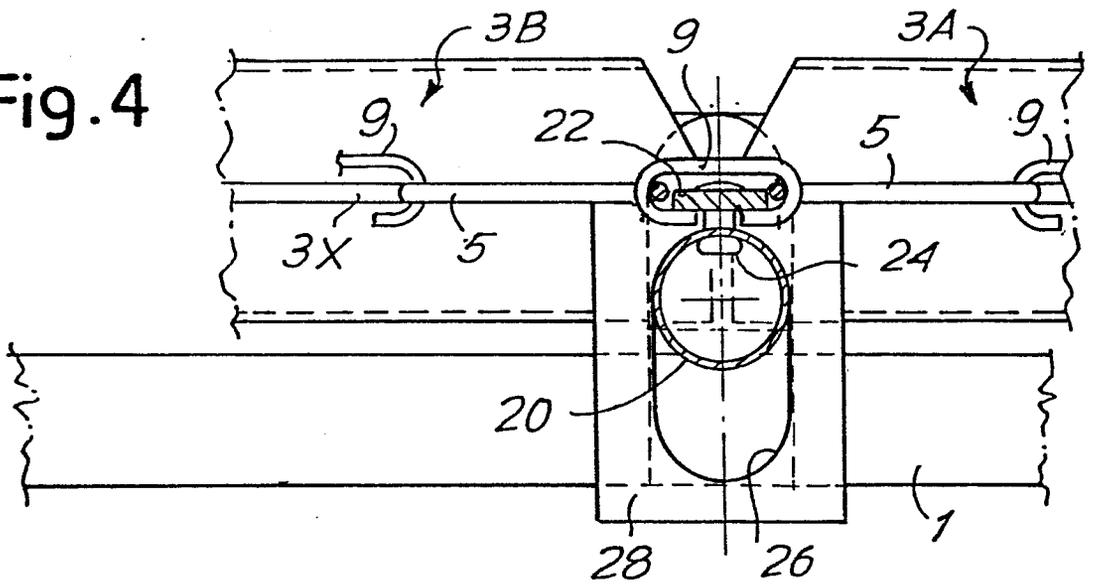


Fig.5

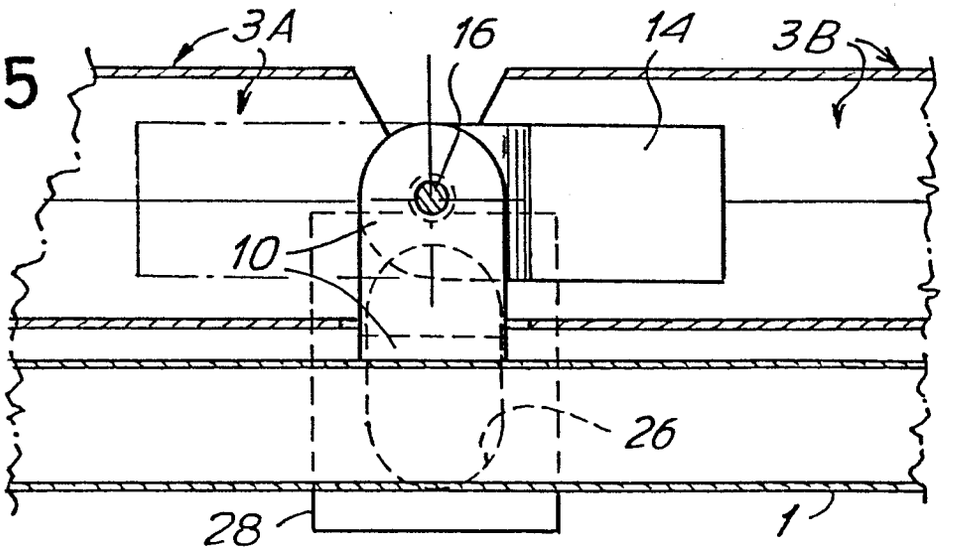


Fig.6

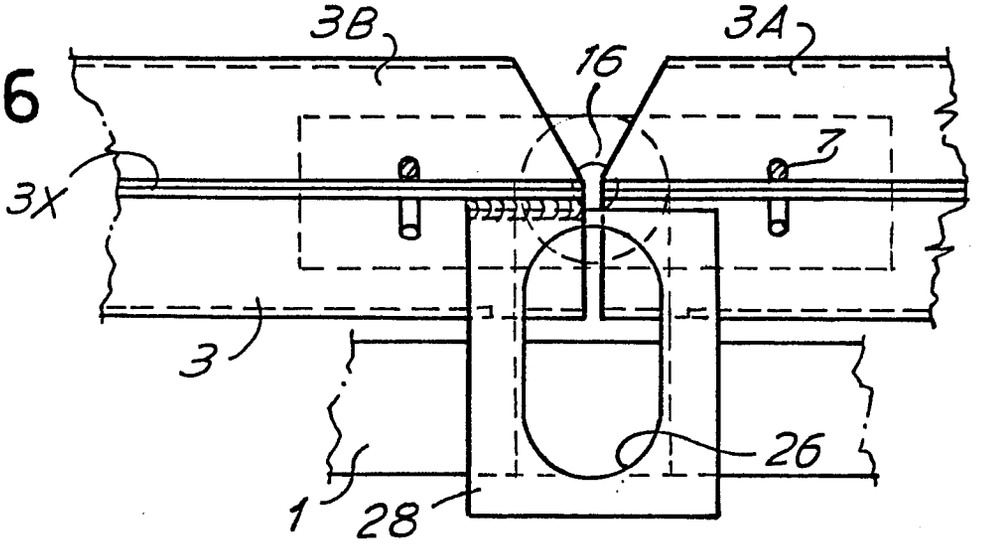
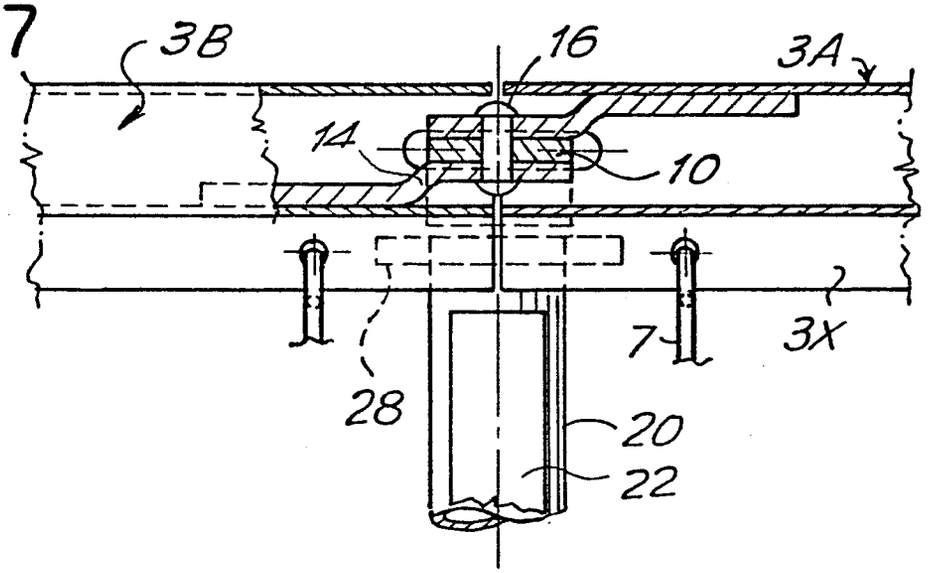


Fig.7



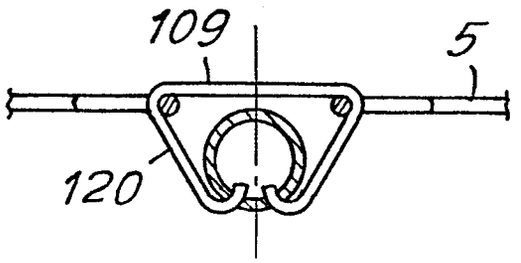


Fig.8

Fig.9

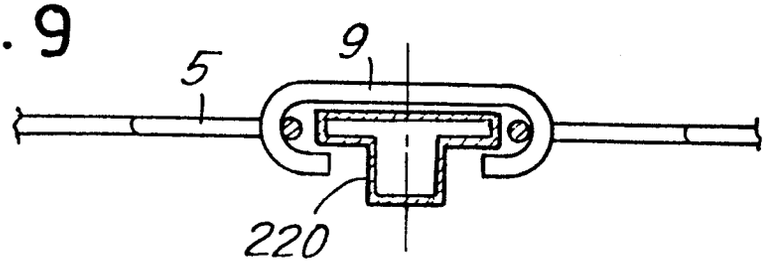


Fig.10

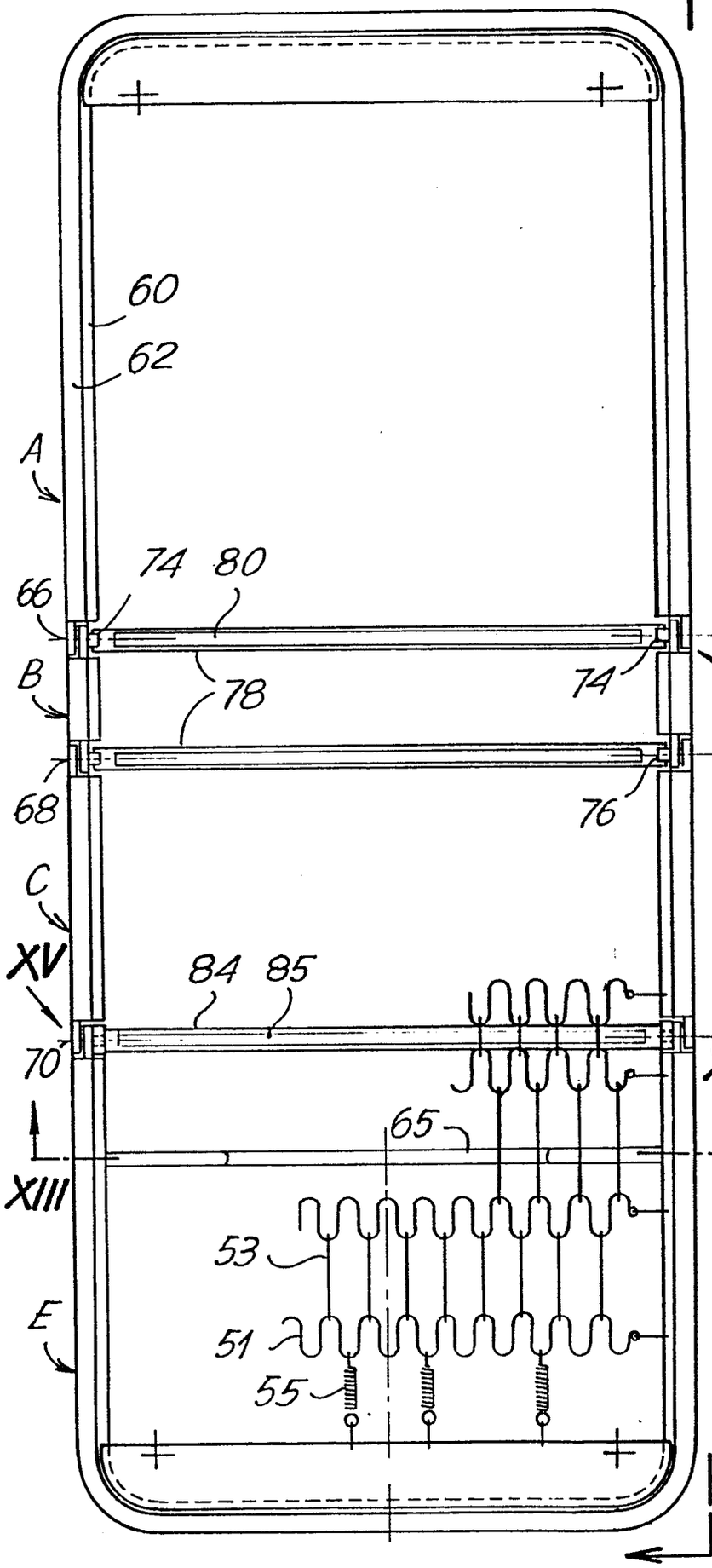
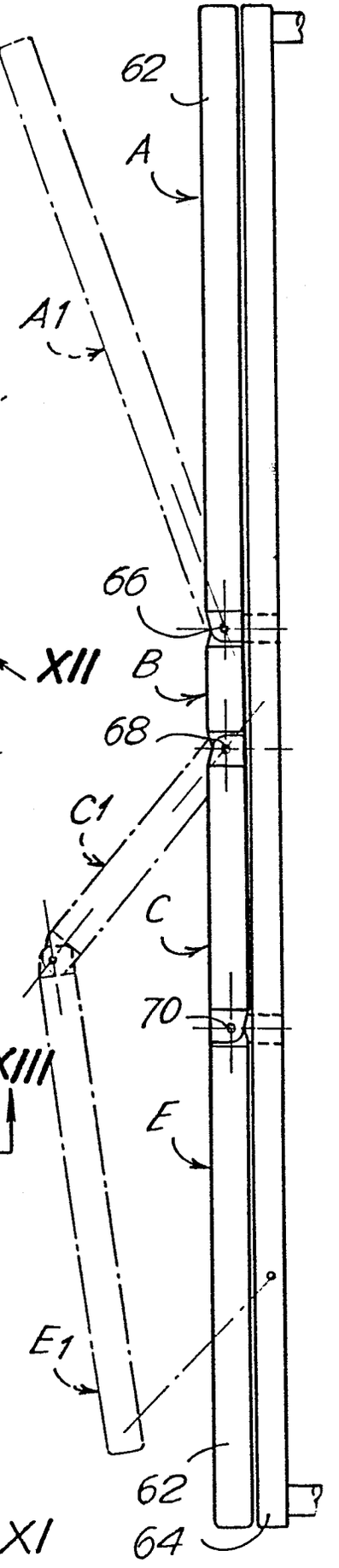

XI
60
62
A
74
80
66
B
78
74
XII
68
76
C
XV
84
85
70
XIII
65
53
51
55
E
XI

Fig.11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A
A1
66
B
68
C1
C
70
E
E1
62
64

Fig.12

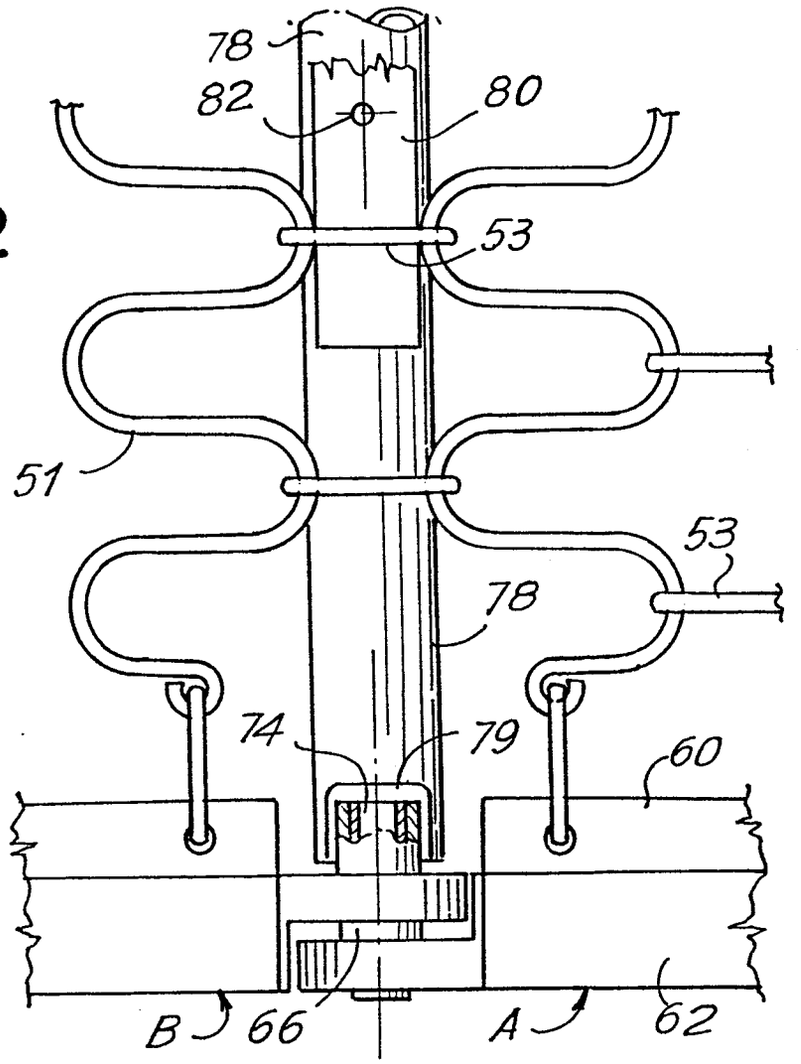


Fig.13

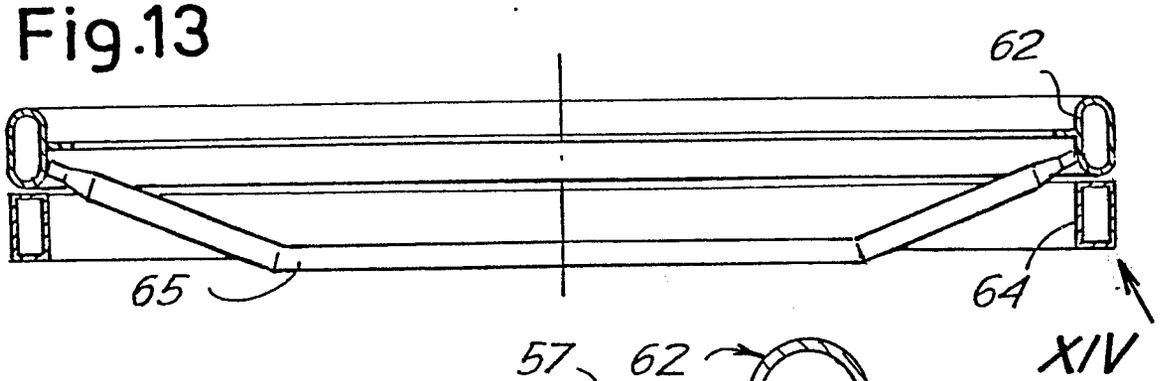
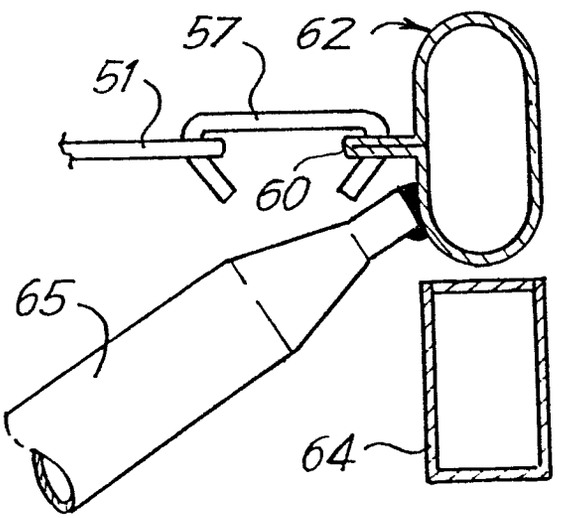


Fig.14



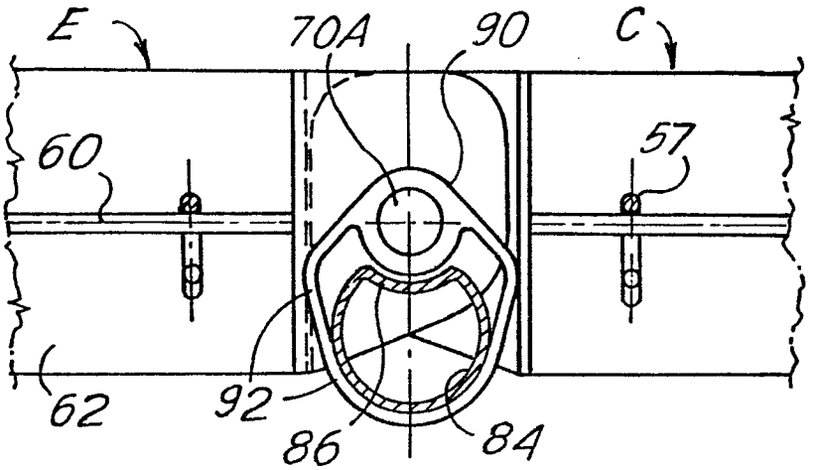


Fig.16

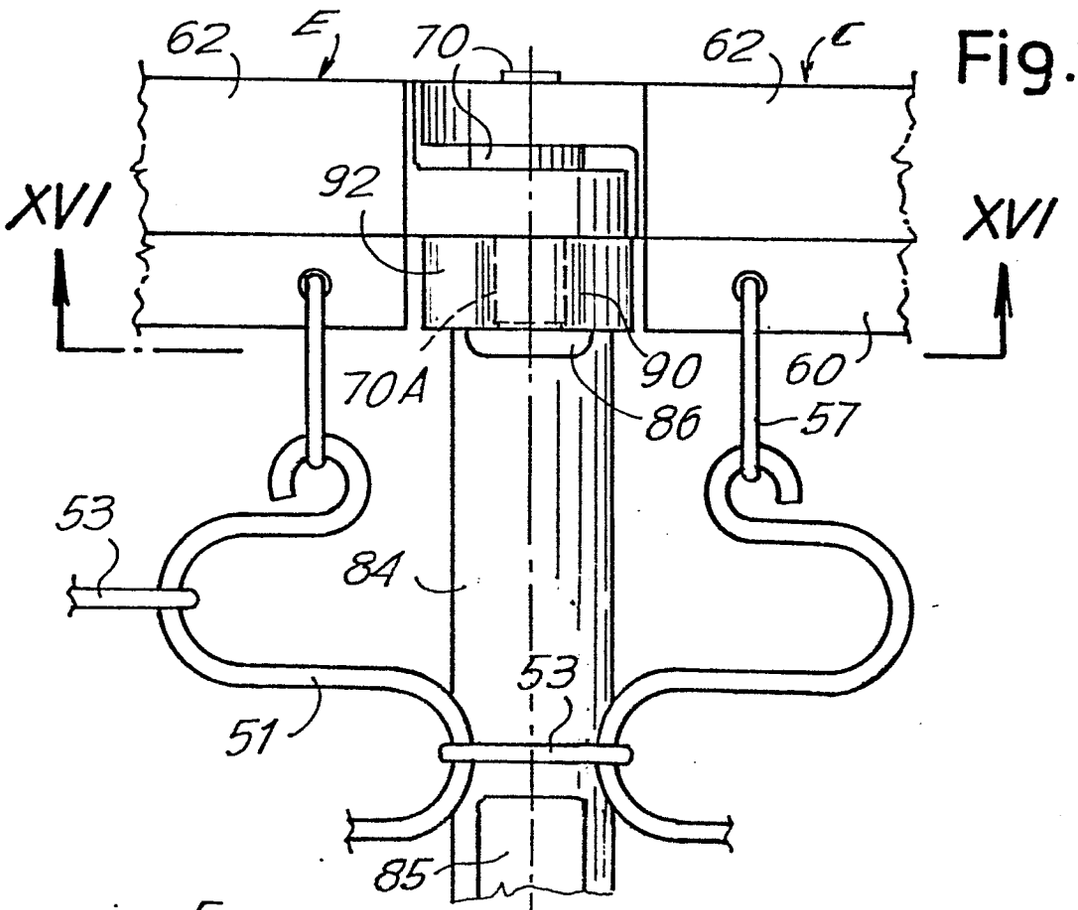


Fig.15

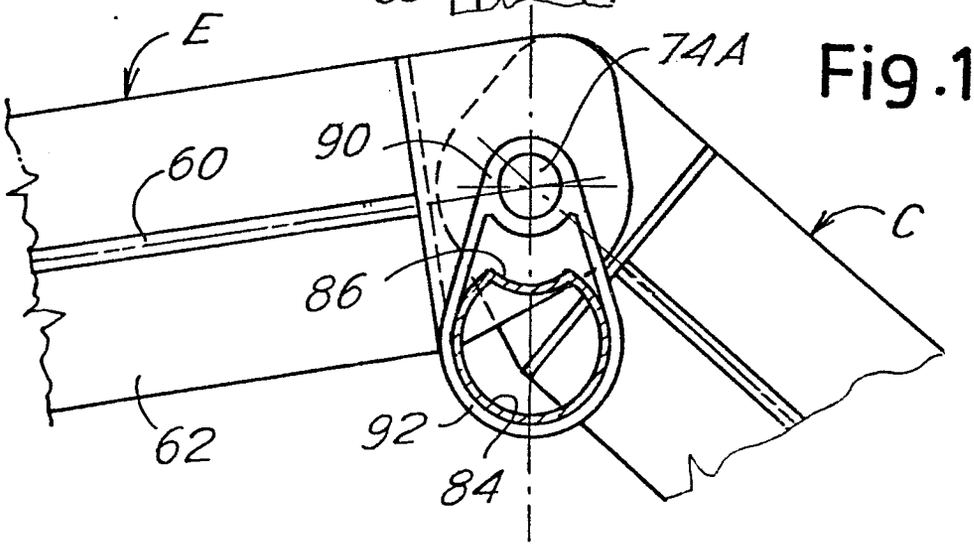


Fig.17