United States Patent [19]

Griffiths

[11] **3,797,886**

[45] **Mar. 19, 1974**

[54] **SEAT FRAMES**

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[73] Assignee: **Youngflex S.A.,** London, England

[22] Filed: **Aug. 1, 1972**

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[52] **U.S. Cl.** **297/452,** 5/354, 297/458

[51] **Int. Cl.** **B60n 1/06,** A47c 7/02

[58] **Field of Search** 5/309, 354; 297/452, 455, 297/458

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Attorney, Agent, or Firm—John A. Hamilton

[57] **ABSTRACT**

A seat frame, particularly for an automobile, comprises a base frame; a pad which comprises a series of parallel cords and a series of parallel cross-wires, and is suspended across the base frame by means of two rows of tension spring members extending from opposite sides of the base frame for connection with the corresponding side edges of the pad; and an edge frame mounted above the base frame on jack spring members which extend upwardly and outwardly from the side edge regions of the pad and are secured at their upper ends to said edge frame. The jack spring members may constitute the upper limbs of jack springs which are anchored at their lower ends on said base frame, or may constitute the upper limbs of jack springs having short horizontal lower limbs which interconnect said rows of tension spring members and the corresponding side edges of the pad. The pad is usually central, and supplementary pads may be arranged wt the sides of the central pad to provide insulation from the individual jack spring members.

10 Claims, 14 Drawing Figures

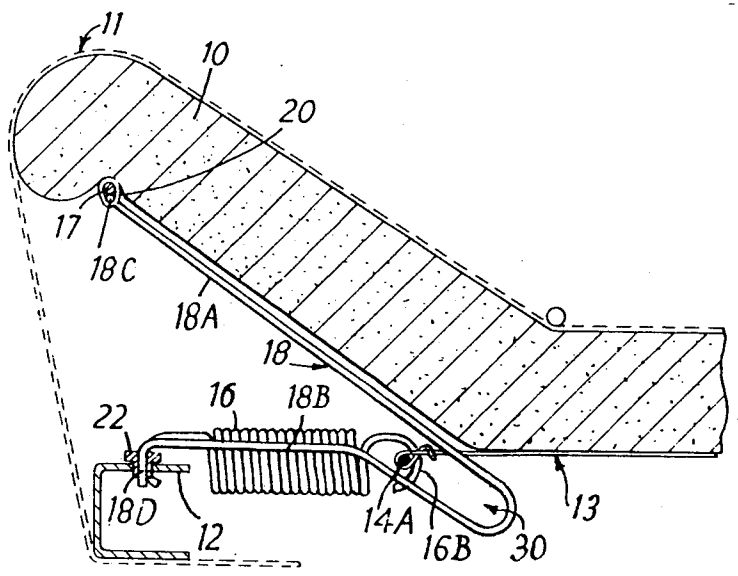


FIG. 1

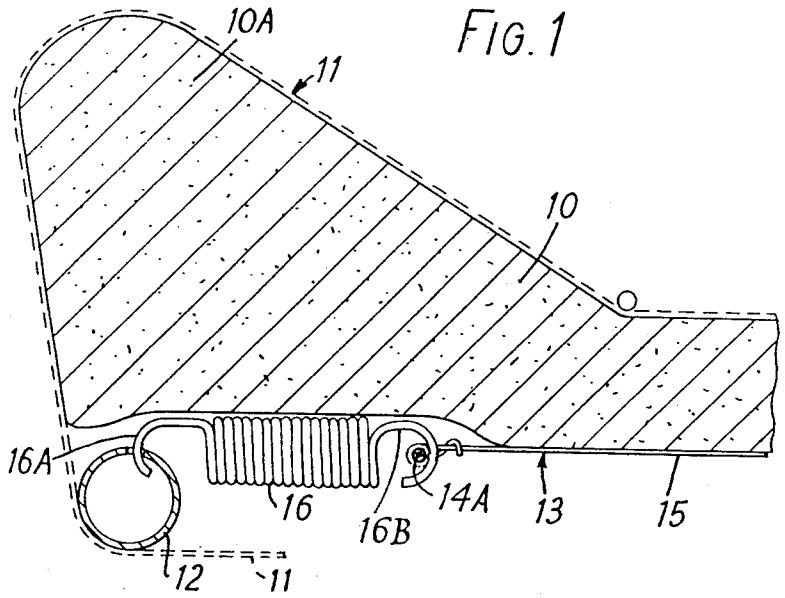

10A
11
10
16A
16
16B
14A
13
15
12
11

FIG. 2

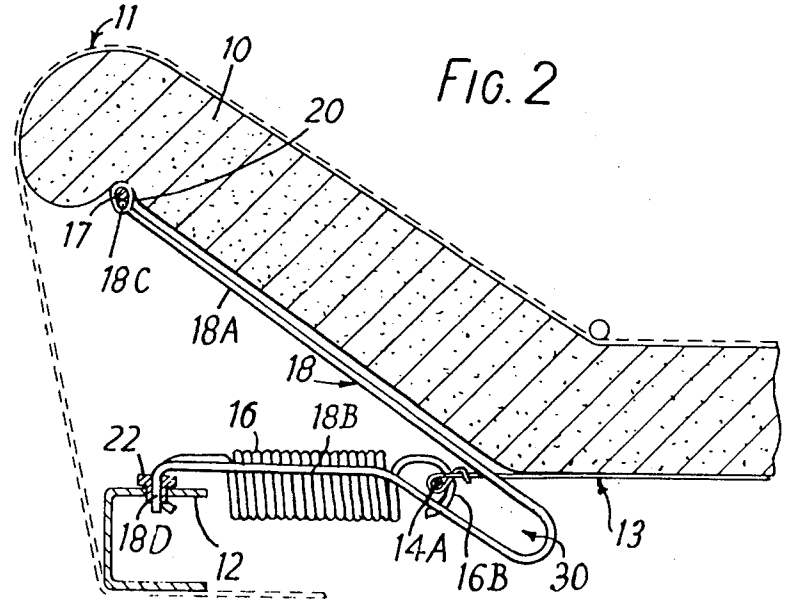

11
10
20
17
18C
18A
18
16
18B
22
18D
12
14A
16B
30
13

FIG. 3.

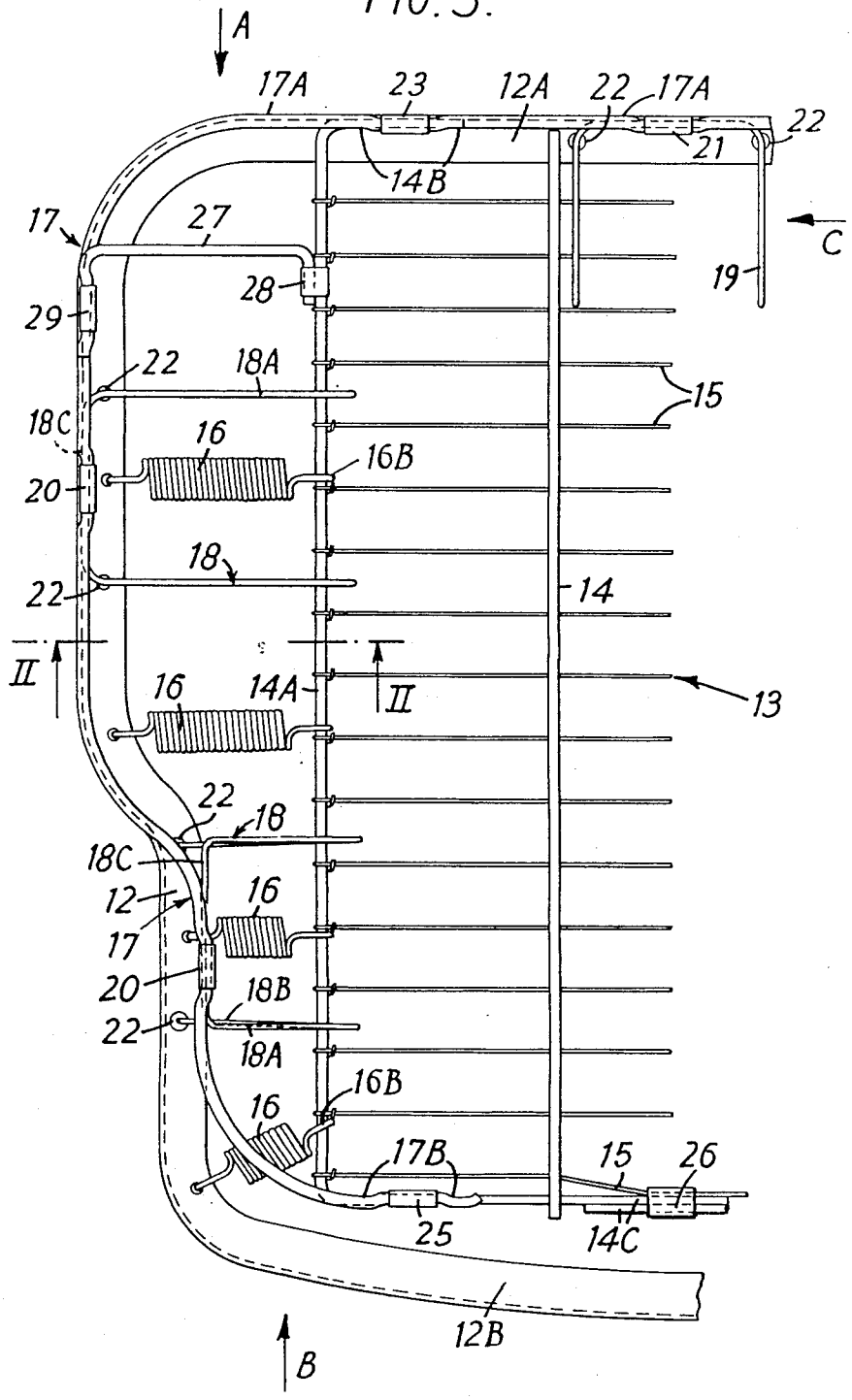

A
17A
23
12A
22
17A
22
21
14B
17
27
C
28
19
29
22
18A
15
18C
16
16B
20
18
22
14
II
II
13
16
14A
22
18
18C
12
16
17
20
18B
22
18A
16B
16
17B
15
26
25
14C
12B
B

FIG. 3A.

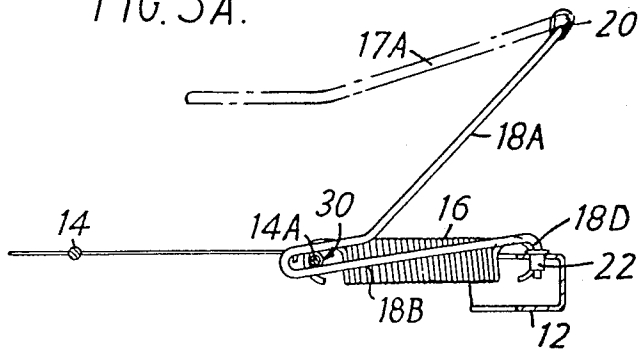


FIG. 3B.

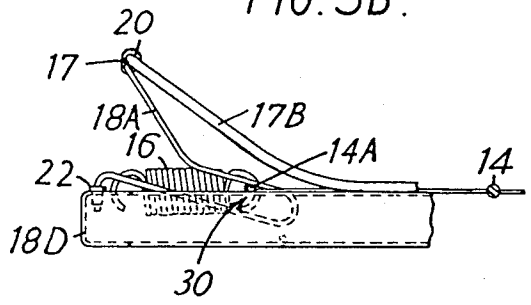


FIG. 3C

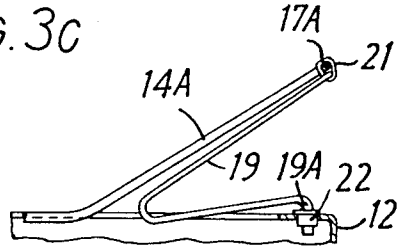


FIG. 4

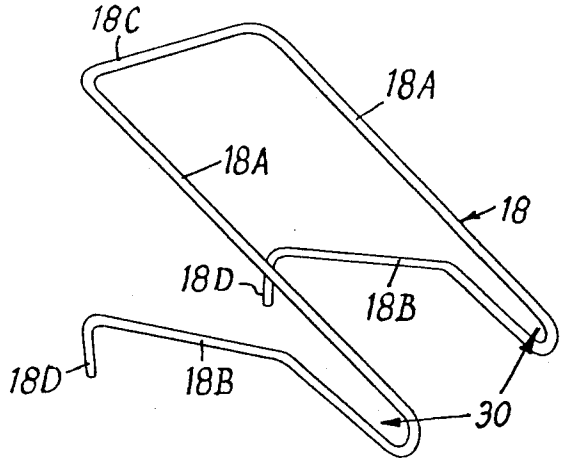

18C
18A
18A
18
18D
18B
18D
18B
30

FIG. 5

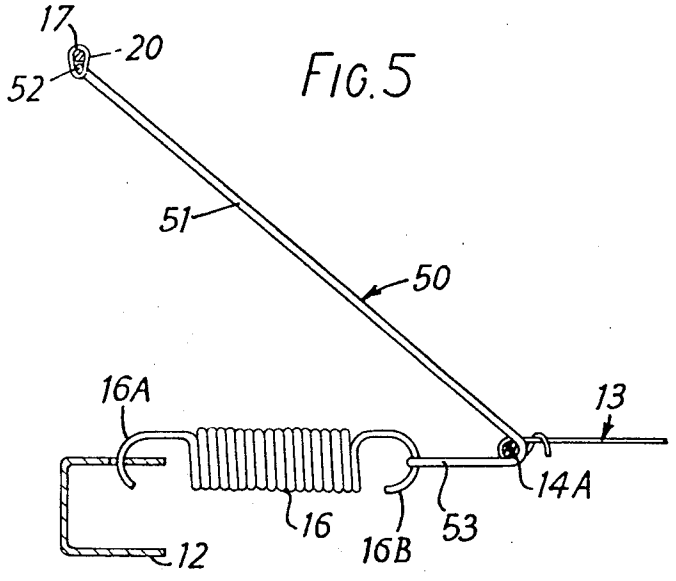

17
20
52
51
50
16A
13
14A
16
16B
53
12

FIG. 6

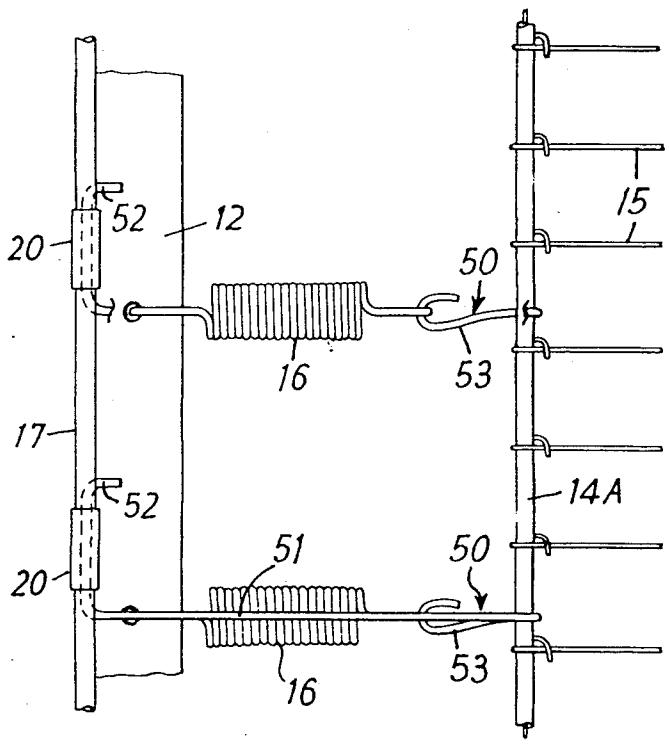


FIG. 7

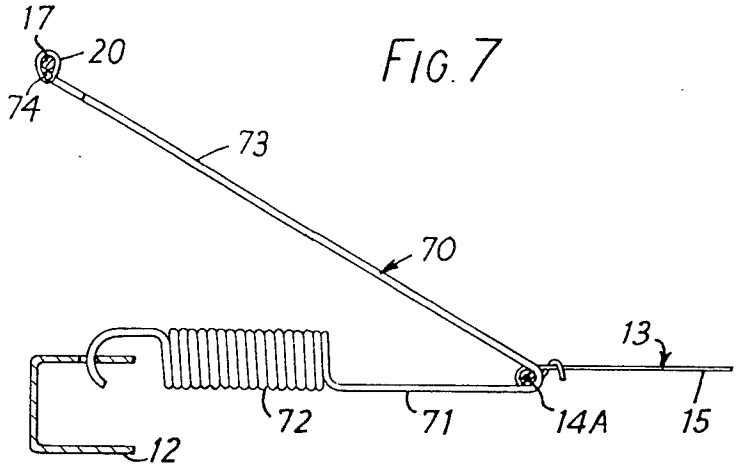

17
20
74
73
70
13
72
71
14A
15
12

FIG. 8

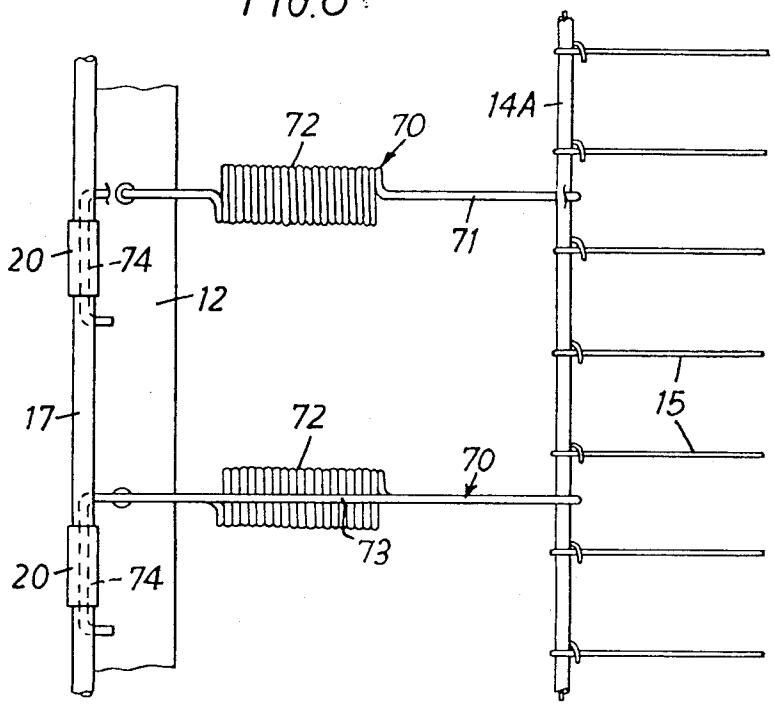

14A
72
70
71
20
74
12
15
17
72
70
73
20
74

FIG. 9

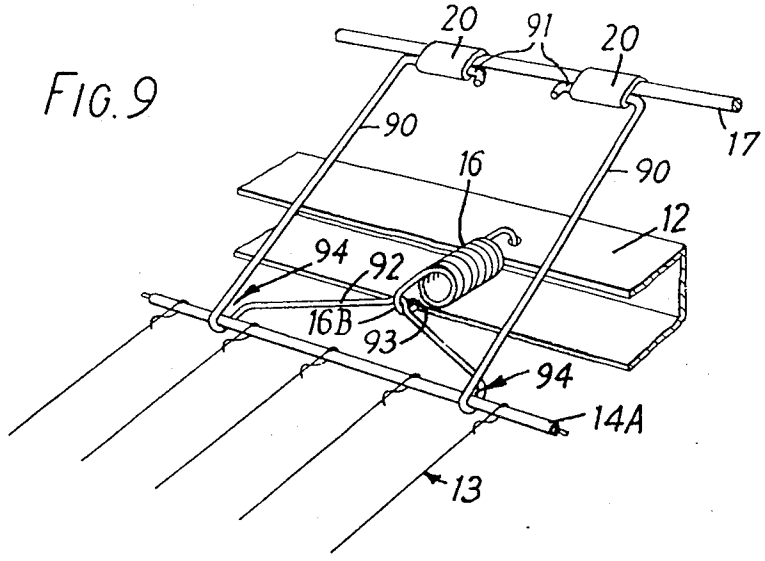

20
91
20
17
90
16
90
12
94
92
16B
93
94
14A
13

FIG. 10

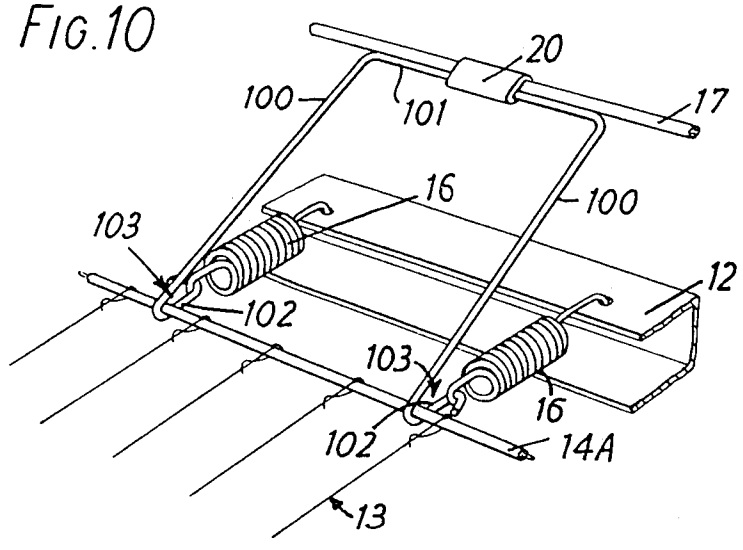
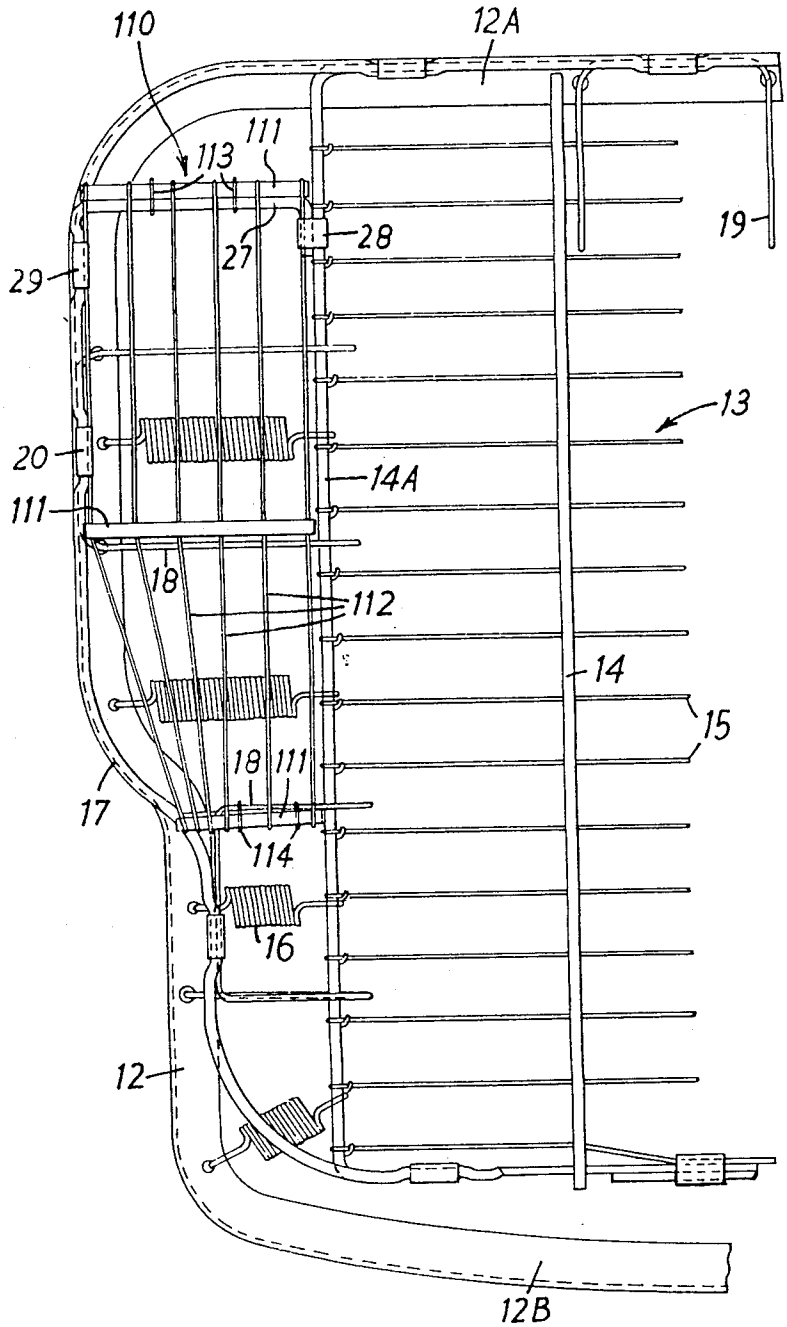

20
100
101
17
16
100
103
12
102
103
16
102
14A
13

FIG. 11.


110
12A
111
113
27
28
19
29
13
20
14A
111
18
112
14
15
18
111
17
114
16
12
12B

SEAT FRAMES

BACKGROUND OF THE INVENTION

This invention relates to seat frames, and has particular application to vehicle seat frames.

It is well known to have a vehicle seat frame of the type comprising a metal base frame across which a PULLMAFLEX pad or the like is suspended by means of helical tension springs; pads sold under the Trade Mark PULLMAFLEX or FLEXOLATOR comprise a series of parallel cords of twisted paper and a series of cross wires penetrating the intermediate cords and locked around the two outermost cords which are wire-cored. In seat frames of this kind, and also in similar frames where a rubber diaphragm or strap unit is used instead of a PULLMAFLEX pad, difficulty can arise in providing a sprung edge. This is usually accomplished by employing a foam plastic or latex moulding which may not be satisfactory as regards cost and comfort.

It is an object of the present invention to provide a seat frame of the above type, which has a sprung edge of improved form and which may be covered by a plastics sheet or the like without the necessity of providing a shaped foam-plastic or latex moulding.

SUMMARY OF THE INVENTION

According to the present invention there is provided a seat frame comprising a base frame, a pad suspended across the base frame by means of two rows of tension spring members which extend from opposite sides of the base frame for connection with the corresponding side edges of the pad, and an edge frame mounted above the base frame on jack spring members which extend upwardly and outwardly from the side edge regions of the pad and are secured at their upper ends to said edge frame. In most cases, the edge frame will extend above the complete front side and at least the forward parts of the lateral sides of the base frame. The pad may extend upwardly at its front end where it is secured to the front part of said edge frame, and the rear end of the pad may be secured to a rear part of said edge frame where the edge frame and pad lie adjacent the rear part of the base frame.

The jack spring members may constitute the upper limbs of jack springs which are anchored at their lower ends on said base frame. Alternatively, the jack spring members may constitute the upper limbs of jack springs having short horizontal lower limbs which interconnect at least the forward groups of said rows of tension spring members and the corresponding side edges of the pad. In another alternative, the jack spring members may constitute the upper limbs of composite jack springs whose lower limbs incorporate helical lengths which provide at least the forward groups of said rows of tension springs. In a further alternative, the jack spring members may constitute the upper limbs of jack springs which comprise a pair of upper limbs interconnected by a common lower limb which is attached to one of said tension spring members. In yet a further alternative, the jack spring members may constitute the upper limbs of jack springs which comprise a pair of upper limbs interconnected by a yoke which is secured to the edge frame, and a pair of lower limbs which are each attached to one of said tension spring members.

It will be appreciated that, if desired, combinations of these various forms of jack spring may be employed in any particular seat structure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary section through an edge part of a conventional form of vehicle seat;

FIG. 2 is a similar section through one form of seat according to the invention and corresponding to II—II in FIG. 3;

FIG. 3 is a half plan view of the frame of the seat illustrated in FIG. 2, and FIGS. 3A, 3B and 3C are views in the directions of arrows A, B, and C, respectively, showing jack springs;

FIG. 4 is a perspective view of a jack spring shown in FIGS. 2 and 3;

FIGS. 5 and 6 and FIGS. 7 and 8 are fragmentary sections and corresponding plan views and FIGS. 9 and 10 are fragmentary perspective views showing four alternative forms of seat frame according to the present invention; and,

FIG. 11 is a half plan view of a seat frame provided with supplementary pads.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to FIG. 1 of the drawings, a conventional form of shaped seat edge is provided by a moulded pad 10 of foam plastic or latex overlaid by a cover trim indicated at 11. The pad 10 has a shoulder 10A along each lateral side and is supported on a seat frame which comprises a tubular or like base frame having lateral side lengths 12. A PULLMAFLEX pad 13, comprising a series of paper cords 14 of which the outermost cords 14A are wire-cored, and cross-wires 15 which are locked around the cords 14A, is suspended from the base frame by two rows of helical tension springs 16 provided with hooked ends 16A which are anchored in the side lengths 12 and with similar ends 16B which hook round the cords 14A.

This conventional form of vehicle seat construction involves disadvantage in the expense and inconvenience of providing a specially shaped pad 10, and also the resilience characteristics or "feel" of the seat edge may not be completely satisfactory.

Referring now to FIGS. 2, 3, 3A, 3B, 3C and 4, which illustrate a seat according to the present invention, a top edge frame 17 formed of resilient wire extends above the base frame and is carried by jack springs 18 and by a generally similar jack spring 29. The jack springs 18 are anchored in each of the side lengths 12 and the jack spring 19 is anchored in front length 12A of the base frame to give supplementary support to front length 17A of the edge frame 17. The jack springs 18, which are illustrated in FIG. 4, comprise upper limbs 18A and lower limbs 18B. The jack springs are U-shaped in plan and yokes 18C of each U are clamped to the edge frame 17 by clips 20. Likewise, the jack spring 29 is clamped to the front length 17A of the edge frame 27 by a clip 21.

To minimise noise during use of this seat, nylon or like bushes 22 are inserted into openings in the tube lengths 12, 12A to receive ends 18D of the lower limbs of the jack springs 18 and corresponding ends 19A of the jack spring 19. Further to minimise noise, the jack springs 18 and 19 may have plastics or like coatings.

The front length 17A of the edge frame 17 is clamped to inturned front ends 14B of the cords 14A by metal clips 23 which may also embrace the foremost of the cross wires 15. The rear lengths 17B of the edge frame 17 are likewise clamped to inturned and overlapping

rear ends 14B of the cords 14A by clips 25 which may also embrace the rearmost of the cross wires 15. In this embodiment, the lengths 17B are interconnected by the overlapping ends 14C which are clamped together by clip 26 which also embraces the rearmost wire 15. It will be appreciated, however, that the lengths 17B may overlap one another and be clamped together, in which case the cord ends 14C may be of shorter length as are the ends 14B. Similarly, at the front end, the cord ends may be extended to overlap one another, in which case the frame 17 may have two short lengths (17). In each case, however, it is desirable that the edge frame (17) should be effectively continuous and that the pad should have an effectively continuous peripheral cord (14A).

The front length 17A of the edge frame is held above the base frame by the jack spring 19, as indicated in FIG. 3C, and the edge frame may slope generally uniformly downwards towards the rear so that the rear lengths 17B are approximately level with rear length 12B of the base frame. The pad 13 curves upwardly at its front end and stabilising tie cords 27 extend between the cores 14A and the edge frame 17, the tie cords being clamped at their ends by clips 28, 29.

The shape of the jack springs 18 shown in FIGS. 2 to 4 is significant, and it will be noted that the upper and lower limbs 18A, 18B of each spring cooperate to form slots 30 in which the cords 14A are in free sliding engagement. This allows the pad 13 to be moved without unduly deflecting the jack springs, and the jack springs to be independently deflected without interfering with the natural lay of the pad 13, but the jack springs are so dimensioned that the tension springs 16 are not overstrained when the outer cords reach the ends of the slots 30.

Referring now to FIGS. 5 and 6, jack springs 50 comprise upper limbs 51 which extend upwardly to be clamped at their ends 52 to the edge frame 17 and short lower limbs 53 which are hooked to connect with the tension springs 16. The two limbs 51 and 53 are acutely angled to receive the cord 14A, and it will be appreciated that this spring construciton is more economical to produce than the construction shown in FIGS. 2 to 4.

FIGS. 7 and 8 sho w a development of the previous embodiment, wherein jack springs 70 are of composite construction and have their lower limbs 71 formed with helical lengths 72, which eliminates the necessity for the tension springs (16). This construction is also economical to produce and, by appropriate selection of wire gauges, number of spring coils, limb lengths, etc., the "feel" of the spring edge can be accurately controlled. Again, upper limbs 73 are clamped at their ends 74 to the edge frame 17.

Referring now to FIG. 9, the jack spring is formed from a single length of resilient wire and comprises a pair of upper limbs 90 which extend upwardly to be clamped at their ends 91 to top edge frame 17, and a shorter lower limb 92 which is formed with a central bow 93 to connect with tension spring 16. The upper limbs 90 and the common lower limb 92 are acutely angled to receive the outermost cord 14A of pad 13, in slots 94.

Referring now to FIG. 10, the jack spring is formed from a single length of resilient wire and comprises a pair of upper limbs 100 which extend upwardly to be interconnected by a yoke 101. The yoke 101 is clamped to the top edge frame 17 by one or more clips 20. Two short limbs 102 extend from the limbs 100 at an acute angle to receive the outermost cord 14A of the pad 13, in slots 103, and the ends of limbs 102 are hooked to connect with tension springs 16. In a modification, the jack spring illustrated in FIG. 10 may be integral with the two tension springs 16.

It will be appreciated that the jack springs illustrated in FIGS. 9 and 10 have the advantage of the simplicity of the spring arrangements illustrated in FIGS. 5 to 8 and also incorporate substantially the stability of the spring illustrated in FIGS. 2 to 4.

Combinations of the above-described constructions may well be employed in the production of the finished seats.

The structures described above, in accordance with the invention, thus provide seat frames which can be covered simply by foam plastic or latex pads 10 of uniform thickness and then by cover trim 11, to provide sprung edges which exhibit highly satisfactory characteristics for use in a vehicle such as a motor car. Furthermore, the depth and other dimensions of the seats can be selected by suitably arranging and dimensioning the jack springs which can be of various alternative forms. The frames may also be used in, for example, domestic furniture and the same or similar structures may also be incorporated in seat backs.

In the constructions illustrated above the pad 13 is central and does not extend completely across the base frame. Thus, the two side margins of the foam pad 10 are supported only by the jack springs which may be spaced apart by an appreciable distance. In the modified construction illustrated in FIG. 11, in which the "feel" of the spring edges is further improved, supplementary pads 110, suitably also formed of twisted paper cords 111 and wires 112, are provided at the sides of the central pad 13 to insulate the foam pad 10 from the individual jack springs 18. The supplementary pads are clamped at their sides to the cords 14A and the edge frame 17, by the aforementioned clips 20, 28 and 29, and at their ends are hog-ringed by rings 113 to the tie cords 27 and by rings 114 to the rear jack springs 18.

Reference has so far been made to the jack springs being provided along both lateral sides of the seat, and possibly also along the front side of the seat. It will be appreciated, however, that one or other of the jack spring arrangements may be provided along the front of the seat or, in certain circumstances, along only one of the lateral sides of the seat.

I claim:

1. A seat frame comprising a base frame having opposite sides, a pad having side edges, two rows of tension spring members connected to and extending from the opposite sides of the base frame, means connecting said spring members with the corresponding side edges of the pad to suspend the pad across the base frame, jack springs engaged at their lower ends with the side edge regions of the pad and extending upwardly and outwardly therefrom, and an edge frame mounted above the base frame on the upper end parts of said jack springs, wherein said pad includes cords extending along the side edges thereof, and in which at least a number of said jack springs constitute acutely angled upper and lower limbs, the associated pad edge cord being engaged in the angle between said limbs, the upper and lower limbs of said jack springs cooperating

to form slots along which the side cords of the pad are free to slide, said tension spring members being connected directed to said side cords, and said lower limbs being anchored on said base frame.

2. A seat frame as claimed in claim 1 in which said pad is centrally disposed between said base frame sides and with the addition of supplementary pads disposed at the sides of the central pad to provide insulation from the individual jack springs, said supplementary pads overlying said jack springs and being attached thereto, but not to said central pad.

3. A seat frame comprising a base frame having opposite sides, a pad having side edges, two rows of tension spring members connected to and extending from the opposite sides of the base frame, means connecting said spring members with the corresponding side edges of the pad to suspend the pad across the base frame, jack springs engaged at their lower ends with the side edge regions of the pad and extending upwardly and outwardly therefrom, and an edge frame mounted above the base frame on the upper end parts of said jack springs, at least a number of said jack springs comprising acutely angled upper and lower limbs, the associated pad edge being engaged in the angle between said limbs, said lower limbs being short and connected at their free ends to at least the forward groups of said rows of tension spring members, thereby to serve as said means connecting said tension spring members with the corresponding side edges of the pad.

4. A seat frame as claimed in claim 3 in which said pad is centrally disposed between said base frame sides, and with the addition of supplementary pads disposed at the sides of the central pad to provide a insulation from the individual jack springs, said supplementary pads overlying said jack springs and being attached thereto, but not to said central pad.

5. A seating frame comprising a base frame having opposite sides, two rows of tension spring members connected to and extending from the opposite sides of the base frame, means connecting said spring members with the corresponding side edges of the pad to suspend the pad across the base frame, jack springs engaged at heir lower ends with the side edge regions of the pad and extending upwardly and outwardly therefrom, and an edge frame mounted above the base frame on the upper end parts of said jack springs, at least a number of said jack spring comprising acutely angled upper and lower limbs, the corresponding side edge of said pad being engaged in the angle between said limbs, and said lower limbs incorporating helical lengths which provide at least the forward groups of said rows of tension spring members.

6. A seat frame as claimed in claim 7 in which said pad is centrally disposed between said base frame sides, and with the addition of supplementary pads disposed at the sides of the central pad to provide insulation from the individual jack springs, said supplementary pads overlying said jack springs and being attached thereto, but not to said central pad.

7. A seat frame comprising a base frame having opposite sides, two rows of tension spring members connected to and extending from the opposite sides of the base frame, means connecting said spring members with the corresponding edges of the pad to suspend the pad across the base frame, jack springs engaged at their lower ends with the side edge regions of the pad and extending upwardly and outwardly therefrom, and an edge frame mounted above the base frame on the upper end parts of said jack springs, at least a number of said jack springs each comprising a pair of upper limbs and an interconnecting common lower limb which is acutely angled to said upper limbs and is attached to one of said tension spring members, the corresponding side edge of said pad being engaged in the angle between said upper and lower limbs.

8. A seat frame as claimed in claim 7 in which said pad is centrally disposed between said base frame sides, and with the addition of supplementary pads disposed at the sides of the central pad to provide insulation from the individual jack springs, said supplementary pads overlying said jack springs and being attached thereto, but not to said central pad.

9. A seat frame comprising a base frame having opposite sides, two rows of tension spring members connected to and extending from the opposite sides of the base frame, means connecting said spring members with the corresponding side edges of the pad to suspend the pad across the base frame, jack springs engaged at their lower ends with the side edge regions of the pad and extending outwardly and upwardly therefrom, and an edge frame mounted above the base frame on the upper end parts of said jack springs, at least a number of said jack springs each comprising a pair of upper limbs, an interconnecting yoke which is secured to the edge frame, and a pair of lower limbs which are acutely angled to said upper limbs, and each of which lower limbs is attached to one of said tension spring members, the corresponding side edge of said pad being engaged in the angle between said upper and lower limbs.

10. A seat frame as claimed in claim 9 in which said pad is centrally disposed between said base frame sides, and with the addition of supplentary pads disposed at the sides of the central pad to provide insulation from the individual jack springs, said supplementary pads overlying said jack springs and being attached thereto, but not to said central pad.

* * * * *