July 21, 1936. O. V. KUHNER 2,048,126

SEAT CONSTRUCTION

Filed Aug. 4, 1933

Fig. 1

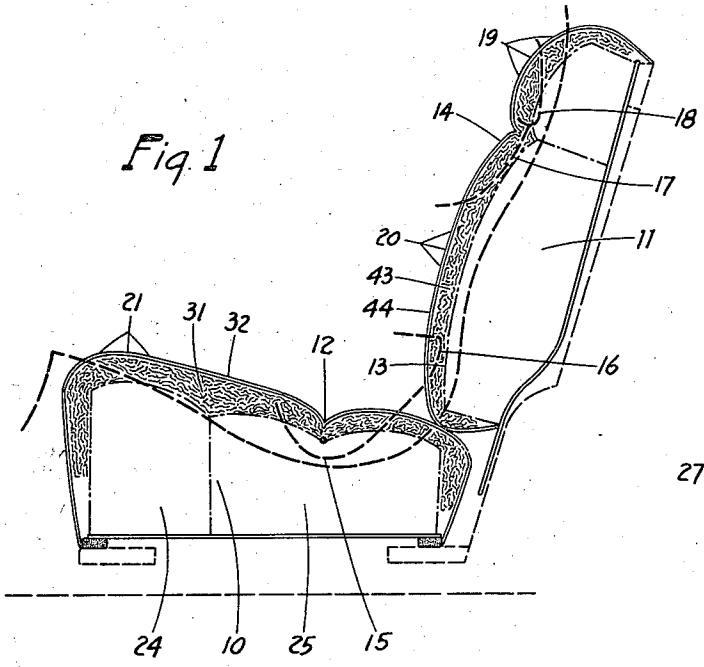
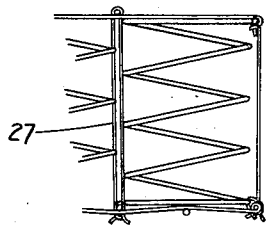


Fig. 6



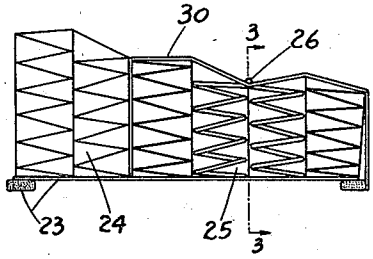


Fig. 2

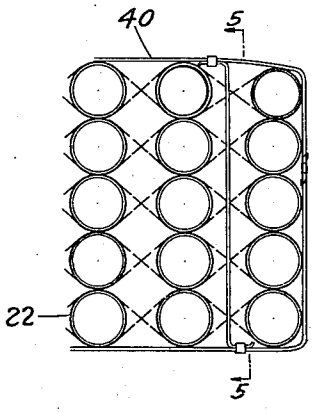


Fig. 4

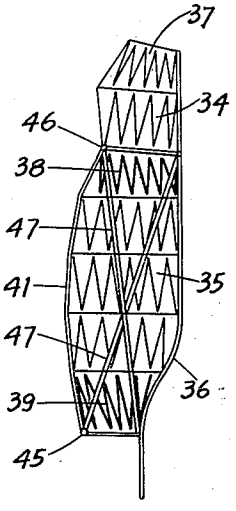


Fig. 5

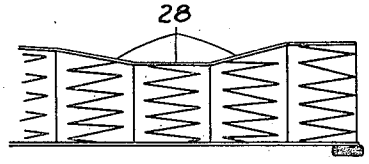


Fig. 3

Oscar V. Kuhner

INVENTOR

BY Whittemore Hulbert Whittemore & Belknap

ATTORNEYS

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SEAT CONSTRUCTION

Oscar V. Kuhner, Detroit, Mich.

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2 Claims. (Cl. 155—179)

This invention relates to seat constructions, and refers more particularly to upholstered seats of the type employed in vehicle bodies.

It is well established among students of anatomy that the human body structure, in a sitting position, is peculiarly fitted to bear resistance at certain points or narrowly confined areas, and at certain other areas is not adapted to bear resistance, due to interference with muscular action or pressure on muscles, nerves or blood vessels, all of which induce fatigue. The aforesaid points or areas particularly adapted to bear resistance are the bottom of the pelvis, the back of the pelvis, and the rib structure below the scapulae or shoulder blades. On the other hand, the areas previously referred to as not adapted to bear sustained resistance are the lumbar region between the top rim of the pelvis and the lower edge of the rib structure, the back above the lower points of the scapulae, and the upper leg muscles in back of the knees. It is therefore, one of the principal objects of this invention to provide a seat wherein the major weight bearing resistances are concentrated at a practical minimum of areas opposed only to the points or areas of the anatomy particularly fitted to bear resistance, and wherein the other portions of the seat adapted to register with the areas of the body not fitted to bear resistance are built up of resistances substantially less than in orthodox construction.

It is also known that comfort is enhanced and fatigue lessened in the sitting position by a certain degree of relaxation of torso posture, embodying a degree of straightening of the normal erect posture curves of the lumbar and dorsal vertebrae of the spine. Accordingly, another feature of this invention resides in the provision of a seat wherein the relative location, arrangement and proportioning of the major weight supporting areas are such as to automatically position and maintain the occupant in such comfort posture while the vehicle is in motion, allowing without restriction voluntary movement for the use of controls, etc.

A further object of this invention resides in the provision of a seat wherein the locations of the weight supporting points or areas previously referred to may be readily varied during manufacture to fit particular individuals whose build, weight, and, consequently, position in the vehicle do not come within the limits of the average.

A still further object of this invention resides in the provision of a seat possessing all of the foregoing features capable of being manufactured without departing from standard practice in so far as the particular materials employed and general method of assembly are concerned.

The foregoing as well as other objects will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawing, wherein:

Figure 1 is a semi-diagrammatic cross sectional view through a seat constructed in accordance with this invention;

Figure 2 is a cross sectional view through the seat cushion;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a fragmentary elevational view of the seat back with the upholstery removed for the sake of clearness;

Figure 5 is a sectional view taken on the line 5—5 of Figure 4;

Figure 6 is a fragmentary sectional view illustrating one method of tying that may be employed.

Although it will be apparent as this description proceeds that the inventive principles involved herein are applicable to numerous different types of seats irrespective of the specific construction or appearance thereof, nevertheless, for the purpose of illustration, these principles are shown herein as incorporated in a vehicle body seat of orthodox design in so far as appearance and materials employed are concerned. This type of seat is selected for the purpose of illustration in order to disclose the manner in which the novel features of the present invention may be realized without departing from standard practice in so far as general construction is concerned, and also because it is highly desirable to insure a comfort posture in a vehicle seat inasmuch as the occupants are oftentimes confined to a sitting posture for a considerable length of time.

The seat shown in Figure 1 for the purpose of illustration comprises a seat cushion 10 and a back cushion 11 supported in the usual manner in proper relation to the seat cushion. Both of the aforesaid cushions are built up of a plurality of springs of any suitable type, and in standard production, the height of the seat cushion is predetermined in dependence upon the dimensions of the average individual in order to obtain maximum road visibility. Irrespective of the particular construction of the seat, the latter is provided with weight bearing portions opposed to the points or areas of the anatomy adapted to bear resistance without inducing fa-

tigue or discomfort. The aforesaid weight bearing portions of the seat are designated in Figure 1 by the reference characters 12, 13, and 14. As will be more fully hereinafter set forth, these portions extend entirely across the seat, and, in standard production, are accurately located in dependence upon the dimensions of an average individual so that when the latter assumes a comfort posture in the seat, the portions will register with the parts of the anatomy particularly adapted to bear resistance. The portions of the anatomy particularly fitted to bear resistance, are shown by the dotted lines in Figure 1, and, as will be observed from this latter figure, the portion 12 on the seat cushion is accurately located to register with the ischia or bottom of the pelvis 15, while the portion 13 of the back cushion registers with the ilia or back of the pelvis designated herein by the reference character 16. The portion 14 on the back cushion is so located as to register with the rib structure 17 located immediately below the scapulae or shoulder blades 18. This arrangement permits the occupant of the seat to assume as well as maintain a comfort posture without fatigue or the exertion of muscular effort, since the portions 12 and 13 of the seat are so located as to support the pelvis in the position thereof required for comfort posture, and, as a consequence, these supports take the place of the usual muscular effort required to maintain a comfort posture. The point 14 on the seat back is accurately located with respect to the points 12 and 13 so as to maintain the proper head balance in the comfort posture position.

Inasmuch as the scapulae must be more or less free to move with the muscle sheaths controlling the shoulders and arms, the area 19 of the seat back above the portion 14 is considerably softer than in the latter portion, and, in the present instance, has a resistance lower than provided in seats now commercially produced. Moreover, in view of the fact that the lumbar area 20 of the back of the anatomy, or, in other words, the area from the top rim of the pelvis to the lower ribs, is practically unprotected, this area is also relatively soft so as to afford only a minimum degree of resistance, and to assist in the assumption of a comfort posture of the torso. The portion 21 of the seat cushion in advance of the portion 12 and especially the front edge of the cushion are also relatively soft so that the minimum resistance is opposed to the upper leg muscles under the knees permitting freedom of movement of the legs and feet of the occupant. This arrangement permits the occupant of the seat to assume and maintain a comfort posture without fatigue or exertion of muscular effort, since the portions 12, 13 and 14 of the seat are so located and proportioned as to support comfort posture properly without undue resistance to or restriction of further voluntary movement.

The seat briefly defined above not only provides for properly supporting the anatomy in a comfort position when the vehicle within which the seat is installed is not in motion, but also insures the maintenance of this posture while the vehicle is in motion, and, in the case of the driver, during manipulation of the several controls. In this connection, it is to be noted that, mechanically, the body may be considered as a double toggle joint, braced at the feet, with joints of opposite bend at the knees and hips, and capable of exerting pressure at the back of the pelvis on the portion 13 of the seat, at the back of the shoulders or rib structure on the portion 14 of the seat, or both. Thus, it will be seen that movement of the body due to operation of the usual pedal controls reacts largely at the back of the pelvis against the portion 13 of the back. Also, straightening of the body double toggle previously referred to, to meet road shock movement, effects a raising of part of the body weight from the seat cushion, applying this weight to the seat back at the resistance area 14, and damping the further involuntary movement of the body through increased friction. It will be apparent from the foregoing that the movement of the body in the seat effected by manipulation of the controls or the action of the vehicle will be taken at the resistance points 12, 13, and 14 on the seat without destroying the low resistance areas referred to above so that even during movement, the exertion of undue pressure on the portions of the anatomy not fitted to bear resistance is prevented.

In the majority of cases, the location of the weight supporting points on the seat may be selected in accordance with the build of the average individual, but since a great many people do not come within the limits of the average, the present invention contemplates a seat construction which permits varying the locations of the weight supporting portions relative to each other in order that the seat will fit a particular individual. As will be more fully hereinafter set forth, the seat may be individually fitted by merely changing the locations of the weight supporting portions in dependence upon the dimensions of the particular individual, and this may be accomplished herein at a nominal cost due to the fact that it requires but slight alteration or difference in parts.

The particular seat selected herein for the purpose of illustrating the foregoing is shown somewhat in detail in Figures 2 to 6, inclusive, and, as will be apparent from these latter figures, the seat as well as the back cushion is formed of a plurality of coil springs designated generally herein by the reference character 22. In detail, the seat cushion 10 comprises a substantially rigid base or frame 23, and two spring units 24 and 25, of which the rear unit 25 is secured to the frame 23 in any suitable manner. The unit 24 is located in advance of the unit 25, and the two or more rows of coils forming this unit are relatively soft so as to form the low resistance area 21 of the seat cushion. In the present instance, the unit 25 contains four or more rows of coil springs and is provided with a definitely located line formed by wire 26 extending across the seat at a point usually between the front and rear edges of the unit or between the innermost coils of the latter. The line or wire 26 may be adjusted along the length thereof for height and cross contouring by mechanically tying the same at a number of points to the base 23 through the medium of ties 27. In the specific embodiment of the invention shown in Figure 2, the coils in proximity to the wire 26 or, in other words, the coils on opposite sides of the latter are considerably stiffer than the remaining coils so as to form the relatively high resistance portion 12 of the seat cushion. If desired, the wire 26 may be tied so that the seat cushion assumes the cross contouring illustrated in Figure 3 providing a depression 28 of such dimension to, in effect, automatically position the occupant with the lower end of the pelvis in

registration with the portion 12 of the seat cushion. As shown in Figure 2, the rear unit 25 is tied to the frame and simultaneously contoured and cross contoured by means of the wire 26, ties 27, and an inner cover 30: the front unit 24 is tied to the front edge of the rear unit 25 by suitable clips or ties, and contoured by the outer upholstery 32. In accordance with conventional practice, suitable padding 31 is interposed between the outer upholstery 32 of the seat cushion and the inner covering aforesaid so as to impart a soft exterior surface to the seat. By employing the inner covering in the manner specified above, the usual spears normally provided in the seat cushion to locate the outer edges thereof may be eliminated, with the result that the cost of manufacture is not only reduced, but the objectionable noises resulting from movement of the springs relative to the spears is eliminated.

The back cushion 11 of the seat consists of a substantially rigid base or frame 36, an upper spring unit 34 of two or more rows of relatively soft coils which form the low resistance area 19 of the seat, and the lower or main spring unit 35. The frame 36 is vertically adjustable, and is secured in any suitable manner to the lower unit 35. The lower unit 35 consists of a plurality of rows of coils, of which the top row 38 and the bottom row 39 are relatively stiff, forming the high resistance portions 13 and 14 of the seat, and the intermediate rows are relatively soft, and form the low resistance portion 20 of the seat. A border wire 40 surrounds the front marginal edge of the back cushion, and diagonal braces 47 are provided to accurately space the front lower edge 45 and the front top edge 46 in respect to each other. The lower unit 35 may be contoured and cross contoured by means of an inner cover 41. The upper unit 34 is fastened to the front corner 46 of the lower unit and contoured by the outer upholstery 44. A soft surface is imparted to the back cushion in the same manner as in the seat cushion by inserting the usual pads 43 between the inner cover aforesaid and the outer upholstery 44. In this connection, it will be noted that in applying the pads and upholstery, surface contouring may be incorporated by merely fastening the upholstery at the desired points to the spring units. As will be observed from Figure 5, the front lower edge 45 of the unit 35 and the corresponding top edge 46 of this unit are accurately located with respect to each other by means of spears 47 extending diagonally of the unit.

As hereinbefore stated, the seat may be adjusted in manufacture to fit individuals that are not within the limits of the average, and this is accomplished herein by merely changing the locations of the portions 12, 13, and 14 of the seat in accordance with dimensional data on the individual. It will be noted that the point or line 12 may be varied by shifting the position of the wire 26 forwardly or rearwardly, and also by shortening or lengthening the associated ties 27: in extreme cases only would alterations be required, and in such extreme instances would affect only the height of the major weight bearing coils immediately adjacent to the wire 26. The position of the portion 13 may be changed vertically by shifting the frame 36, which carries the unit 35, and the relation of the portions 13 and 14 may be varied by changing the length of the braces 47 to expand or contract the front surface of the unit 35.

Thus, from the foregoing, it will be apparent that I have provided a vehicle seat constructed to give maximum comfort to the average individual without departing from accepted practice in so far as materials, general construction methods, and finished appearance are concerned. In addition, it will be noted that my improved seat construction is capable of being altered at slight extra cost to fit persons whose build, weight, and, consequently, position in the car do not fall within the limits of the average.

Inasmuch as it is apparent from the previous description that the principles of the present invention may be obtained by resorting to numerous different types or forms of resistance media including rubber, reservation is made herein to make such changes in the details of construction as may come within the purview of the accompanying claims.

What I claim as my invention is:

1. A seat construction for motor vehicles comprising flexible seat and back paddings and a plurality of resilient weight supporting elements for supporting said paddings, said elements being of different strengths and the stronger of said elements being spaced relative to each other and so located as to directly bear upon and support those portions of the paddings normally engaged by the ischia and ilia of the pelvic girdle and the scapulae of a person on the seat, and the remaining elements being of a weaker character and disposed between and beyond said stronger elements for retaining the seat in shape and conforming said remaining portions to the contour of the person in said seat.

2. A seat construction for motor vehicles comprising seat and back cushions, each of said cushions comprising a spring assembly and a layer of padding thereon, said spring assembly including resilient weight supporting elements of different strengths, the stronger elements in the seat cushion directly engaging that portion of the seat padding which is normally in contact with the ischia of the pelvic girdle of an occupant seated thereon, and the stronger elements of said back cushion directly engaging those portions of the back padding which are normally in contact with the ilia of the pelvic girdle and the scapulae of an occupant seated on said seat, and the remaining elements being of a weaker character and disposed between and beyond said stronger elements for retaining the seat in shape and conforming the remaining portions of the paddings to the contour of the occupant.

OSCAR V. KUHNER.