July 15, 1969 C. H. TURCKSIN 3,455,604

ARTICLE OF FURNITURE SUCH AS A CHAIR

Filed July 17, 1967 3 Sheets-Sheet 1

Fig.1

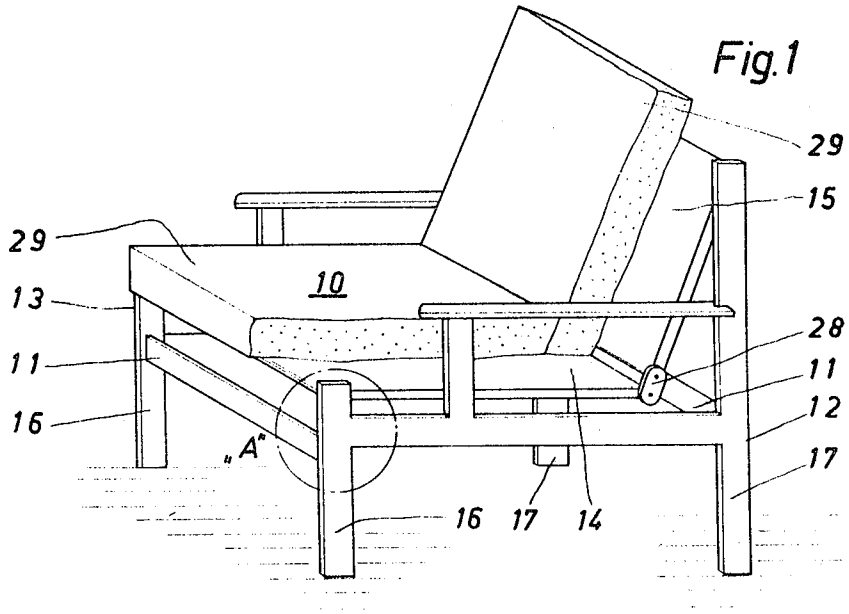
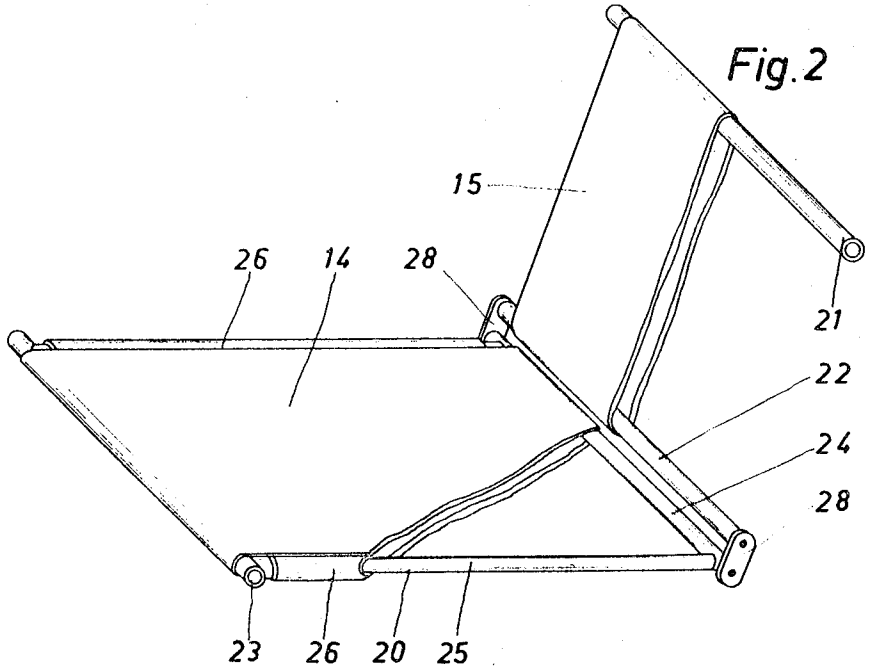



Fig.2



July 15, 1969 C. H. TURCKSIN 3,455,604

ARTICLE OF FURNITURE SUCH AS A CHAIR

Filed July 17, 1967 3 Sheets-Sheet 2

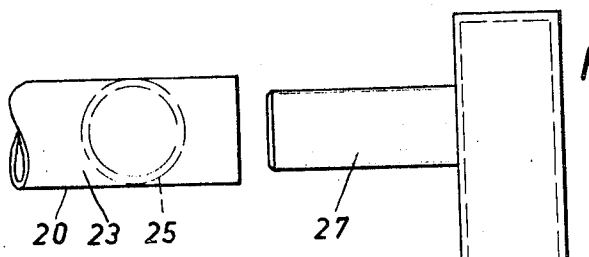



Fig. 3
„A"

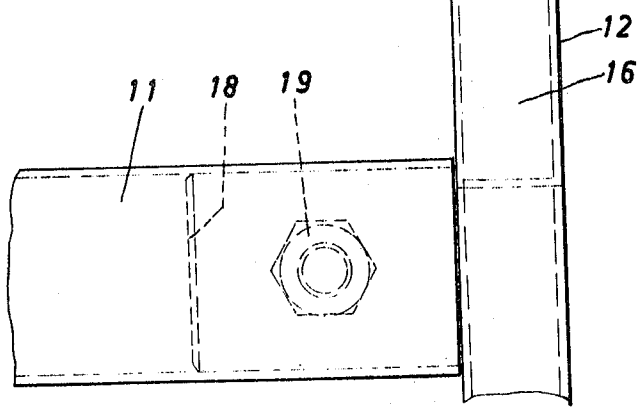
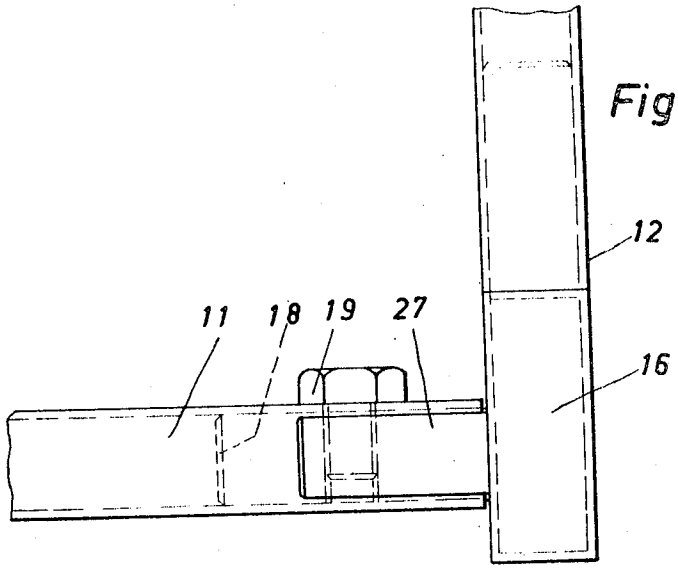



Fig. 4



July 15, 1969 C. H. TURCKSIN 3,455,604

ARTICLE OF FURNITURE SUCH AS A CHAIR

Filed July 17, 1967 3 Sheets-Sheet 3

Fig.5

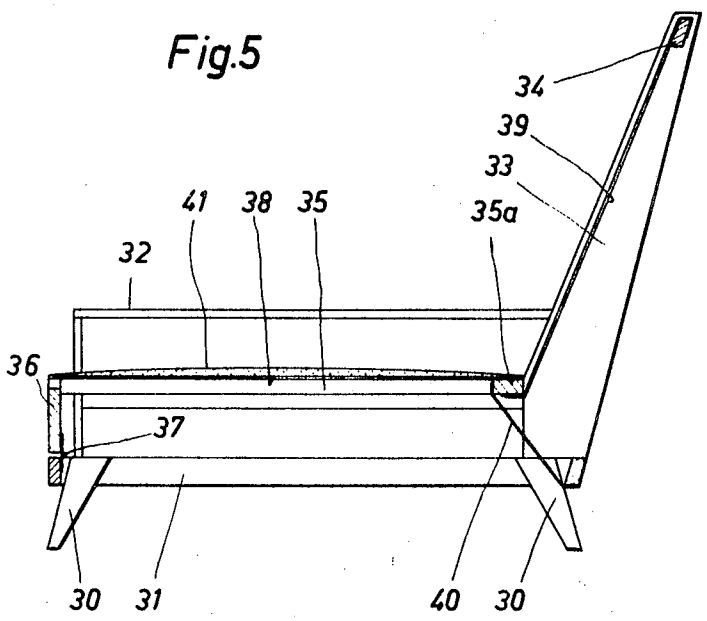
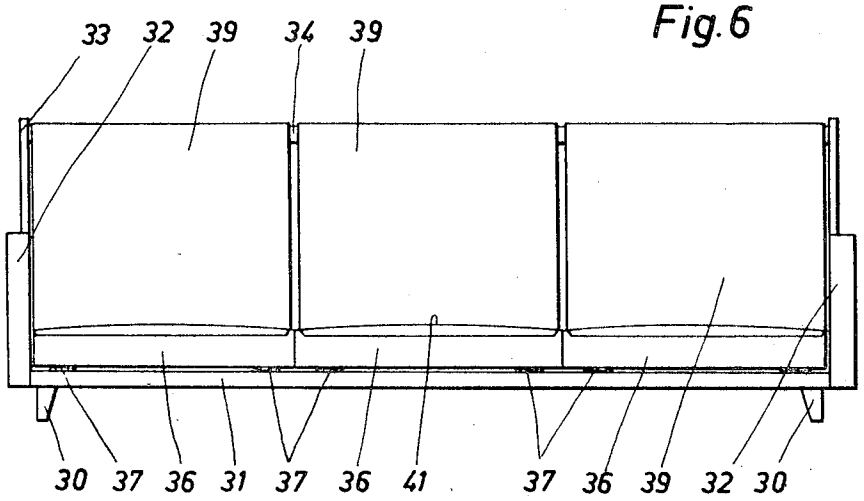



Fig.6



United States Patent Office 3,455,604 Patented July 15, 1969



3,455,604

# ARTICLE OF FURNITURE SUCH AS A CHAIR

Christian H. Turcksin, 69a Bachstrasse, Detmold, Lippe, Germany

Filed July 17, 1967, Ser. No. 653,897
Claims priority, application Germany, July 18, 1966, T 31,612
Int. Cl. A47c 5/06, 7/18, 5/04
U.S. Cl. 297—441 5 Claims

## ABSTRACT OF THE DISCLOSURE

An article of furniture such as a chair comprising a chassis, a pivot bar at the front edge of the seat portion of said chassis, a pivot bar at the upper end of the back portion of said chassis, first and second resilient bands and a tubular coupling member, said first band extending from said front pivot bar to said coupling member and said second band extending from said coupling member to said back pivot bar.

The present invention concerns an article of furniture such as a reclining chair or settee having bands arranged between a frame acting as spring supports for the sitting and reclining surfaces and back-rest.

In armchairs and reclining chairs of this kind already known in practice there are provided either a plurality of continuous bands or several bands arranged independently of one another secured on both sides to act as spring support for the sitting and/or reclining surface and back rest spring-support.

The continuous bands sag freely and have the disadvantage that the sitting and/or reclining surface merges in the back-rest; this makes it difficult to balance the body, the back portion being deficiently or unfavourably supported and sagging of the back portion promoted.

If separate bands are provided for the sitting and/or reclining surface, the sitting surface bands are stressed so considerably that they sag or have to be very thick, whilst the back-rest bands are not sufficiently stressed.

It is an object of the invention, whilst avoiding such deficiencies, to provide an armchair and/or reclining chair or settee with a simple spring support having a favourable effect.

In accordance with the invention in a seating and/or reclining article of furniture such as a chair, settee or the like having bands arranged between a frame to act as spring support for the sitting and/or reclining surface and for the back-rest an elastic band per se, which at the one end is connected with the frame and at the other end with the adjacent band articulatedly to a spring suspension unit.

In a preferred embodiment the sitting or reclining strap band and the back-rest band are freely suspended in the coupling region. In accordance with a further preferred embodiment the sitting and/or reclining band is stretched over a frame journalled to the chassis, the back-rest band being able to support the sitting and/or reclining article of furniture. Thus, in a modified embodiment the seating and/or reclining band and the back-rest band may be provided around a common beam by means of hinges or the like on the frame journalled to the chassis, which frame may be divided. Furthermore it is preferred for the seating band and the backrest support band to be formed as a double spring suspension and to be made of a fabric having elastic filaments extending parallel to the axis of symmetry of the article of furniture.

The invention will now be described further, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view of a reclining chair;



FIG. 2 is a perspective view of the hingedly interconnected elastic seating surface and back support of the same chair, partly cut away;

FIG. 3 is an enlarged front view of a corner joint of the frame of the same chair, corresponding to the fragmentary section A in FIG. 1 and with the seating surface dismounted;

FIG. 4 is a plan view of the same corner joint;

FIG. 5 is a longitudinal section through a modified embodiment of a sitting and/or reclining article of furniture with hingedly interconnected, elastic sitting surface and back support; and

FIG. 6 is a front view of the sitting and/or reclining article of furniture shown in FIG. 5.

In an article of furniture for sitting and/or reclining, such as for example chair **10** or the like, between a preferably dismountable chassis formed by two side members **12, 13** preferably retained parallel by means of cross struts **11**, a seating band **14** forming a seating surface and hingedly connected therewith a back support band **15** acting as back support are pivotally suspended. These bands **14, 15** form a freely suspended (floating) spring support resilient in accordance with the displacement of body weight, on which two preferably identical cushions **29** may be placed to act as seating and rear cushion supports (see FIG. 1).

The seating belt **14** and back supporting belt **15** comprise an elastic fabric web joined to form a tube, the warp and/or weft filaments preferably have cores of vulcanized rubber filaments which are helically enveloped by textile filaments.

This one seating surface and back support each having two tubes of equal length and varying width forming resilient surfaces are retained in a horizontal cross direction (see FIG. 2) and so formed that the elastic fabric filaments extend parallel to the axis of symmetry of the chair i.e. in the direction of the seating surface depth and back support height.

The seating surface and back support suspension is so elastic and stable that the seat band **14** does not sag and the back support band **15** does not go slack until subject to a load of, for example, five times the weight of a body.

Both side members **12, 13** manufactured as components, preferably of profiled tubing—more especially having a rectangular cross-section—are symmetrically arranged and on the inside surface of a front leg **16** and back leg **17** have pins **18** arranged at right angles adapted to receive the cross strust **11**, which are preferably formed of the identical profiled tubing as the side members **12, 13** (see FIGS. 1, 3 and 4). An arresting device **19**—preferably a screw—to be arranged from the inside surface of the furniture chassis connects one cross strut end with the pin **18** engaging therein (see FIG. 4) and locates it.

The seating band **15** is preferably arranged around a tubular frame **20** and the back support band **15** around two horizontal cross bars **21, 22** made of tubing and extending parallel to one another (see FIG. 2).

The frame **20** is preferably formed of two cross bars **23, 24** guiding the tubular seating band **14** and two connecting rods **25** connected at the end regions therewith by welding or the like, preferably arranged parallel, having a cross-section corresponding to the cross bars **21, 22.**

To prevent the seating surface from becoming unsteady and to ensure a reliable feeling of sitting safely at the lateral bands of the seating band **14** longitudinally extendable from the real to the front an elastic band **26** is secured around and engaging around the connecting bar **25.** These bands **26** also stretch only in one direction, preferably in the direction of the centre of the chair—from the connecting bars **25** to the seat band **14**—and are resiliently connected with the seat band **14** formed as

double spring suspension. This provides a fourfold seat surface suspension and the frame **20** is covered to the corner regions (see FIG. 2).

The cross bars **21**, **23** on the outside of both suspension surfaces are movably mounted and preferably with slight movement obstructing resistance to the side members **12**, **13** of the chassis in each upper region of the front legs **16** and rear legs **17** at a certain distance varying considerably (see FIG. 1) and to bearing pins **27** provided parallel to the pins **18**, whilst the somewhat shorter, inwardly located cross bars **22**, **24** are flexibly interconnected by means of straps **28** displaceably arranged on the ends (see FIGS. 1 to 3).

Both side members **12**, **13** are made of tubular material with a cross-section preferably corresponding to that of the cross struts **11** with or without arm rests. To connect the individual tubular members of each side member **12**, **13** is may be expedient to provide suitable pins which engage in the end of the tubular member of the adjacent part. These pin connections are firmly connected to one another by shrinking on, brazing, welding or the like.

Two cushions **29** and preferably identical are placed at an obtuse angle relative to one another on the seating band **14** and back support band **15** and fixed laterally by the side members **12**, **13** (see FIG. 1).

It is within the scope of the invention for the straps **28** to be fixedly arranged on the frame cross bar **23** and the cross bar **22** guiding the lower back support band region to be mounted displaceably therebetween. Furthermore, the cross bar **21** supporting the back support band **15** may be fixedly but detachably arranged in the upper region of the chassis. It may be advantageous moreover to provide on the underside of the front legs **16** adjusting screw for vertical compensation—in the case of uneven floors—and to adjust the inclination of the seat surface when not subjected to load. Furthermore the adjusting screws may be arranged in the region of the seat frame mounting and act directly on the frame **20**.

When the seat surface is subject to loading, the back rest band **15** absorbs about ⅔ of the weight load and stretches longitudinally, at the same time the frame **20** together with the resilient seat web **14** pivots about the front bearing point, the angle between the resilient surfaces changes and the vertex of this angle changes its position. In this case the cushions **29** assume a position favourably supporting the body and imparting a safe seating feeling, which automatically changes in conformity with a shifting of weight. The band suspension absorbs every change of position of the load and has a shock absorbing effect.

Such dismantleable articles of furniture for sitting of simple structure are easy to manufacture and are distinguished by a favourable spring suspension. Such a chair or the like in a dismantled state may be stowed away in a small space and requires little shipping space. The structure and the arrangement of the bands **14**, **15** may also be provided in an elongated article of seating and/or reclining furniture, for example a settee or the like, since with identical development and method of operation only a larger dimension is required.

The modified embodiment of an article of seating and or reclining furniture, for example, a settee or the like in FIGS. 5 and 6 of the drawings has a substructure **31** supported by four feet, having for example a rectangular basic shape. On the narrow ends of this substructure **31** vertically upright arm rests **32** are secured which in the rear region are connected to the side members **33** of the back rest laterally supported on the substructure **31** and pointing diagonally upwards and rearwards. A cross beam **34** firmly connecting the side members **33** extends in the upper end region of the side members **33**.

Halfway up the arm rests **32** above the substructure **31** a carrier frame **35** is arranged which for example has a rectangular basic shape and in its front region is equipped



with a downwardly extended frame **36** extending vertically to the substructure **31**. In the lower cross region of the frame **36** on the inside surface a hinge **37** is mounted which connected with the substructure **31** produces a hinged mounting between carrier frame **35** and substructure **31**.

An elastic band **38** forming a seating and reclining surface and which is secured to the upper surface of the frame **36** and the carrier frame **35** to the rear cross beam **35***a* thereof by means of tacks, staples, clamps or the like, extends over this carrier frame **35**.

An elastic band **39** placed around the cross beam **34** and also secured thereto with its other free end is firmly arranged on the underside of the cross beam **35***a* of the carrier frame **35** and forms the back support surface.

Both bands **38**, **39** are provided with a certain pretension, so that two resilient spring connected surfaces are formed. To prevent the carrier frame **35** from being drawn up due to the internal tension of both bands **38**, **39** an elastic bracing belt **40** is provided in the lateral region of the seat and reclining surface, which belt on the one hand is secured to the cross beam **35***a* of the carrier frame **35** and on the other hand to the rear substructure **31**. These bracing belts **40** assume a diagonally downwardly facing position and therefore act diagonally downwards, which opposite to the tensional forces of the bands **38**, **39** provides a locating of their seat and reclining and back rest surfaces. Movement of the seat and reclining and back rest surfaces upwardly and outwards is restricted thereby, whereas movement downwardly and inwards is permitted.

In an article of seating furniture such as a chair or the like, the carrier frame **35** has a uniformly closed form and uniformly endless bands **38**, **39** are tensioned.

In an article of reclining furniture, such as a settee or the like the carrier frame **25** preferably comprises three closed individually juxtaposed frames each of which being connected to the substructure **31** by two hinges **37** mounted on the edge. Herewith bands **38** are stretched over the individual frames and each frame has a back support band **39**. The divided carrier frame **35** at each of its edge cross beam regions is equipped with two bracing belts **40** (see FIGS. 5 and 6). This division of a large reclining surface and back support surface into several smaller surfaces advantageously provides surfaces adapted to be subjected to loading independently of one another.

The seat and reclining bands **38** may on the one hand be provided with a foam plastics layer **41** and on the other hand the seat and reclining band **38** and the back support band **39** may be provided with cushions (not shown) assuming an obtuse angle relative to one another and fixed laterally by the arm rests **32**.

In a divided seat and reclining and back support surface divided cushions are also used. When the seat and reclining bands are subject to stress they become resilient due to their elastic and present a soft or harder supporting surface depending upon the magnitude of stress.

The hinged connection between seat and reclining band **38** and the back support band **39** in the common cross beam **35***a* and the connection of the carrier frame **35** supporting the seat and reclining surface to the substructure **31** additionally provides a suspension, since hereby a downwardly pivoting of the carrier frame **35** about its connecting point—the hinges **37**—results. The magnitude of this pivotal movement is determined by the magnitude of loading, since the back rest band counteracts this movement.

The division of the seat and reclining surface into several supporting frames **35** with bands **38** has the great advantage that stresses varying in magnitude are also absorbed resiliently varying in intensity and independent supporting surfaces being provided. Each surface yields in its suspension independently from the other and hence does not affect the adjacent supporting surface.

Production of such a seating and inclining article of furniture from wood or the like is simple and favourable in price; the embodiment of wood, with a ready method of construction shows considerable stability and a reliable method of operation. Such suspensions may also be provided in other kinds of seating and/or reclining furniture, such as for example in automotive vehicle seats or the like.

I claim:

1. An article of furniture, such as a chair, comprising: a chassis having a seat portion and a back portion, the seat portion including a rectangular frame having a pivot bar forming one edge thereof at the front edge of the seat portion and a tubular coupling member forming the rear edge thereof, two resilient bands for the seat portion, one passing from the front to the back of the rectangular frame, the other passing from side to side of the frame, and each band passing around two sides of the frame, the back portion of the chassis including a pivot bar at the upper end thereof, and a further resilient band extending from the coupling member to the back pivot bar.

2. An article of furniture as in claim 1 wherein all resilient bands are elastic and tube shaped.

3. An article of furniture as in claim 2 wherein the elastic bands stretch in the direction of the sides of the tubes so that the bands of the seat stretch in mutually perpendicular direction and the band of the back in the direction of the height of the back.

4. An article of furniture as in claim 3 wherein the



elastic bands are tubular fabric webs woven from filaments having cores of rubber and with coverings of textile filaments.

5. An article of furniture such as a chair, comprising: a chassis having a seat portion and a back portion, the seat portion including a rectangular frame having a pivot bar forming one fixed edge thereof at the front edge of the seat portion and a bar coupling member forming the rear edge of the rectangular frame of the seat portion; a resilient band for the seat portion extending from the front to the back of the rectangular frame, the back portion of the chassis including a pivot bar at the upper end thereof, the bar coupling member at the lower end thereof, and another resilient band extending from the bar coupling member to the pivot bar at the upper end of the back portion.

**References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 2,512,353 | 6/1950 | Magaldino et al. | 297—457 X |
| 2,771,122 | 11/1956 | Straub | 297—441 X |
| 3,123,379 | 3/1964 | Stocking | 297—441 X |
| 3,222,108 | 12/1965 | Pablos | 297—441 |
| 3,348,882 | 10/1967 | Chassaignac | 297—441 X |


CASMIR A. NUNBERG, Primary Examiner

U.S. Cl. X.R.

297—445