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RESILIENT BOTTOM FOR FURNITURE

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U.S. Cl. 5—238 7 Claims

ABSTRACT OF THE DISCLOSURE

A resilient support or bottom for furniture such as a bed or chair comprises laterally spaced side frame members with a plurality of rib members extending between the frame members. The rib members are supported by a first non-elastic stirrup which has one end secured to a frame member and an opposite end which is engaged by an elastic band. A second non-elastic stirrup is looped through the band and it has end portions which are pivotally connected to a rib member. For this purpose the rib member is advantageously slotted inwardly from a side and the second stirrup engages with its ends into the slotted recess.

SUMMARY OF THE INVENTION

This invention relates to a resilient bottom for furnitures, particularly beds.

Resilient bottoms for beds, chairs and the like have been proposed already previously which comprise a plurality of essentially parallel rather rigid ribs which are resiliently suspended between a pair of frame members. In one instance the resilient suspension of the ribs comprises bands or rings of rubber which are secured to the ends of the ribs and the frame members by means of hooks or the like.

The just described furniture bottom is performing well per se but it is slightly susceptible to over load and it is difficult to vary the deflection. Further, the wear on the suspension is unnecessary big.

The present invention has for its object to remedy the said drawbacks, and to this end the furniture bottom according to the invention is characterized essentially in that each resilient suspension comprises a combination of an elastically stretchable element and one or two inelastic, in most or all possible load conditions pivotally journalled element or elements, respectively, arranged one after the other between the frame member and the respective rib.

The furniture bottom according to the invention has the advantage of deflecting easily in response to small loads whereas it at the same time withstands big loads without any impermissible deflection. Furthermore, the furniture bottom is easily adaptable to various requirements.

The invention will be disclosed in more details below with reference had to the accompanying drawing.

FIG. 1 shows one embodiment of a resilient suspension for a rib;

FIG. 2 shows to an enlarged scale how the various forces act on deflection;

FIG. 3 shows an ideal profile of deflection of a bed bottom.

As shown in the drawing a bed bottom may comprise a frame with two frame side members **10** between which a plurality of ribs **11** are resiliently suspended, preferably mutually parallel. The ribs **11** are essentially rigid and may be made of e.g. wood, plastic material or any other suitable material, including metal. Each rib **11** is at each end thereof resiliently suspended from adjacent frame

side member **10** by means of a spring assembly, generally denoted **12**.

Each spring assembly **12** comprises an elastic member **13**, preferably a rubber ring, and one (or two) inelastic, but pivotally journalled, element **14**, preferably an at least essentially closed stirrup of metal wire. The elastic element which for convenience will be referred to as a rubber ring **13** below is secured to the frame side member **10** by means of a stirrup **15**, which may be fixed or pivotal, and which has in this case two bent over ends protruding into a slot **16** in the frame side member **10** wherein they are easily removably retained by means of a pair of pins **17** inserted from above. The pivotal stirrup **14** is introduced into the rubber ring **13** and the legs of said stirrup grip over the end of the rib **11**, wherein the stirrup **14** is pivotally arranged in an inclined slot **18** in the under surface of the rib. It should be noted that a plurality of other ways of securing the rubber ring **13** to the frame side member **10** and securing the pivotal stirrup **14** to the rib **11**, respectively, are possible.

FIG. 2 illustrates that on deflection of the rib **11** a pulling force in direction of the arrow A is exerted on the rubber ring **13**. This pulling force may be converted into a vertically lifting component B and a horizontally pulling component C. On deflection downwardly of the rib **11** the angle y between the horizontal plane and the direction of the arrow A increases, and the lifting component B increases relatively to the horizontally pulling component C. The magnitude of the component B varies as a sinus function of the force A according to the formula:

$$B = A \cdot \sin y$$

This means that the lifting component B varies in dependence of the resistance of the elastic member (the rubber ring **13**) and as a sinus function of the magitude of the angle y.

The magnitude X of the deflection varies according to the formula:

$$X = Z \cdot \tan y$$

wherein Z is the length of the spring assembly **12** in unloaded condition. From this it will be seen that the magnitude X of the deflection varies with Z, and with the tangent value of the angle y. Thus, with the load being the same the deflection increases if Z is increased. The lifting component B increases rapidly with increasing values on the angle y and thus the deflection may easily be varied at will within wide limits by varying the length of the spring assembly **12** and/or the resistance of the rubber ring **13**.

The pivotal stirrup **14** results in that the rubber ring **13** is elongated only a few millimetres with normal deflection which is very advantageous with respect to the useful life time of the rubber ring **13**. Also, the pivotal stirrup permits the rubber ring **13** to be made short and strong for which reason the spring assembly requires only a small space.

FIG. 3 shows generally that a "correct for rest" deflection profile is ensured by a great resistance to high loads and moderate resistance to smaller, loads; of course, this moderate resistance is highly desirable to ensure softness and comfort.

It should be noted that the ribs in some applications may be comparatively wide, such of the order 15–20 centimetres, in which case it may be deemed advantageous to use two or even more spring assemblies **12** for each rib end. Also other modifications and alterations as to details may be made within the scope of the appended claims.

What is claimed is:

1. A resilient bottom for furniture such as beds and chairs, comprising laterally spaced side frame members,

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Fig.1

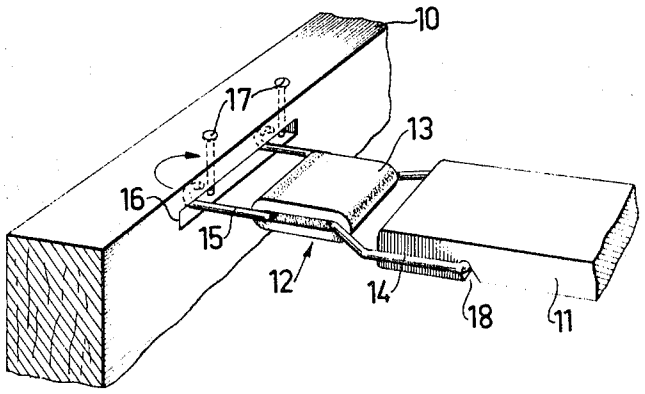


Fig. 2

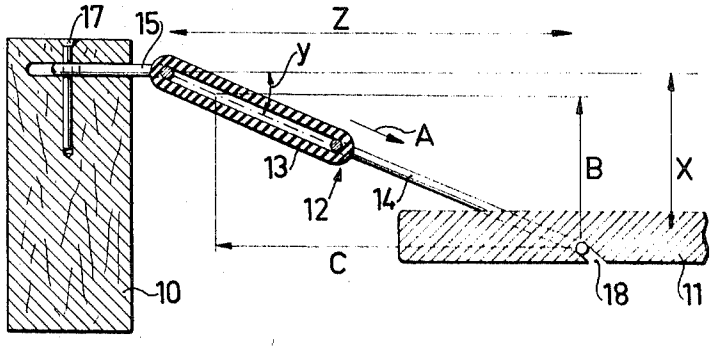
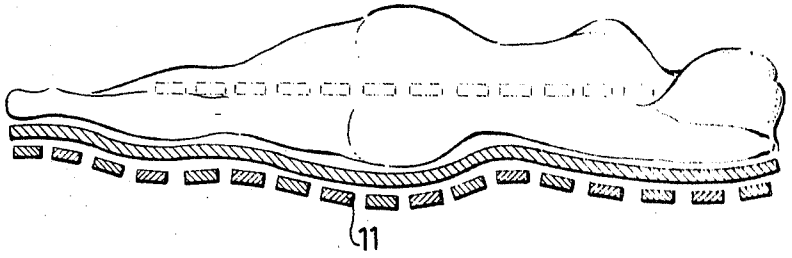


Fig.3



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