

**Title: Floor Spring****Description**

The invention relates to a floor spring having a housing for accommodating a closing mechanism, the housing being  
5 covered by a housing cover bearing a shaft of the closing mechanism which shaft is supporting a door or the like.

Such floor springs are very well known. They have a housing, in which the actual closing mechanism of the door closer is accommodated. A shaft, which is bearing a door  
10 or the like to be actuated, is extending from the housing to the outside. The housing can be closed off by a housing cover, which can be connected to the housing preferably via screws and which is bearing the shaft. DE 295 01 929.8, for example, illustrates such housing cover.

15 A general requirement for forming floor springs is that the housing should be designed as flat as possible. A floor spring having two springs is used to meet this requirement. This however makes it necessary to provide a larger hole in the housing cover of the floor spring for the shaft, which  
20 is bearing the door or the like. By doing so, the rigidity of the whole housing cover decreases and, due to deformations of the housing cover, may lead to problems when operating the floor spring.

Therefore it is an object of the present invention to create a floor spring, which, despite a flat design, guarantees smooth operation.

5 This problem is solved for a floor spring of the type discussed in the introduction with a housing cover having a reinforcing shoulder at least in one peripheral area.

The inventive reinforcing shoulder guarantees that the housing cover, although having a relative flat design, will not deform, such as to always allow for smooth operation  
10 of the door or the like.

The dependent claims represent further embodiments of the inventive subject matter.

In particular if, according to one preferred embodiment, a reinforcing shoulder is provided at the front side and  
15 another reinforcing shoulder respectively at the transversal sides, an embodiment of the housing cover is achieved with particular low-risk deformation.

The inventive subject matter will be explained in more detail on the basis of one illustrated exemplary  
20 embodiment, in which:

Figure 1: shows a housing cover according to the state of the art, from above;

Figure 2: shows the housing cover according to Figure 1, from below;

Figure 3: shows an inventive housing cover from below;

Figure 4: shows a view on the inventive housing cover in the direction of arrow X in Figure 3, and

Figure 5: shows the inventive housing cover from above.

In the Figures just a housing cover 1 being of interest herein is illustrated, but not the complete floor spring.

A view from below of the inventive housing cover 1a is shown in Figure 3. The same housing cover 1a is shown in a view from above in Figure 5 and in Figure 4 in a view from the direction of arrow X of Figure 3.

Traditionally, the housing cover 1a is provided with screw holes a' to e', into which screws for connecting the housing cover 1a to a non illustrated housing of a floor spring can be inserted.

As can be seen from the Figures, reinforcing shoulders 2, 3 protruding from the bottom side of the housing cover 1a are provided.

One of the reinforcing shoulders 2, 3, namely the reinforcing shoulder 2, is formed to be flush with the front side of the housing cover 1a and extends centrally in relation to a longitudinal centre axis L of the housing cover

1a. It presents a linear shape and extends substantially right-angled in relation to the longitudinal centre axis L.

The two other reinforcing shoulders 3 are provided at the transversal sides of the housing cover 1a respectively.

- 5 They are intersected by a transversal centre axis Q of the housing cover 1a and do not extend linearly as does the reinforcing shoulder 2, but they are provided with a bend.

Instead of the illustrated bend, the reinforcing shoulders 3 may likewise be formed curved, for example.

- 10 The reinforcing shoulders 3 provided at the transversal sides of the housing cover 1a are formed on projections 4, which extend to the outside, in the plane of the housing cover 1a in the direction of the transversal centre axis Q. In this case again, the reinforcing shoulders 3 extend aligned  
15 with the exterior edge of the projections.

- It is understandable that the reinforcing shoulders can be arranged at arbitrary locations of the housing cover 1a. In this case, the arrangement can be executed symmetrically or asymmetrically to the axis Q and/or L. The shape does  
20 not need to have a certain embodiment either.

## References

- 1 housing cover according to the state of the art
- 1a housing cover according to the invention
- 2 reinforcing shoulder
- s 3 reinforcing shoulder
- 4 projection
- L longitudinal centre axis
- Q transversal centre axis
- a' to e' screw holes

## Patent claims

1. A floor spring having a housing for accommodating a closing mechanism, the housing being covered by a housing cover bearing a shaft of the closing mechanism which shaft is supporting a door or the like, characterized in that the housing cover (1a) presents a reinforcing shoulder (2, 3) at least at one peripheral area.  
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- 10 2. A floor spring according to claim 1, characterized in that the reinforcing shoulder (2) is provided at a front side of the housing cover (1a) and ends flush with the latter.
- 15 3. A floor spring according to the preceding claims, characterized in that the reinforcing shoulder (2), provided at the front side, is centrally arranged in relation to a longitudinal centre axis (L) of the housing cover (1a).
- 20 4. A floor spring according to the preceding claims, characterized in that two other reinforcing shoulders (3) are provided at two opposite transversal sides.
5. A floor spring according to the preceding claims, characterized in that a transversal centre axis (Q)

of the housing cover (1a) passes through the reinforcing shoulders (3) provided at the transversal sides.

- 5 6. A floor spring according to the preceding claims, characterized in that the reinforcing shoulders (3) provided at the transversal sides are provided at projections (4) which laterally extend beyond the housing cover (1a).
- 10 7. A floor spring according to the preceding claims, characterized in that the length of the projections (4) and the length of the reinforcing shoulders (3) is equal.
- 15 8. A floor spring according to the preceding claims, characterized in that the reinforcing shoulder (2) provided at the front side presents a linear shape.
- 20 9. A floor spring according to one or more of the preceding claims, characterized in that the reinforcing shoulders (3) provided at the transversal sides present a non-linear shape and, in particular, are provided with a bend or are curved.
10. A floor spring according to one or more of the preceding claims, characterized in that all reinforcing shoulders (2, 3) project into the

housing in the mounted condition of the housing cover (1a).