According to the invention, there is provided a
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Forms 7 and 8

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Patents Act 1972

DECLARATION IN SUPPORT OF A CONVENTION OR NON-CONVENTION APPLICATION FOR A PATENT OR PATENT OF ADDITION

No. 78176/81

1. I/we, Gunther Remmerbach, Am Stadtpark 12, 3060 Stadthagen, Germany; Gunther Schmid, Pastor-Waldbert-Str. 5, 3060 Stadthagen, Germany; Dietmar Hilmer, Weidenwinkel 3, 3060 Stadthagen, Germany; and Herbert Wagner, Iserlohmer Strasse 34, 5871 Ihmert, Germany, do solemnly and sincerely declare as follows:

2. The basic application(s) as defined by section 141 of the Act was/were made in the following country or countries on the following date(s) by the following applicant(s) namely:

3. The said basic application(s) was/were the first application made in a Convention country in respect of the invention the subject of the application.

4. The actual inventor(s) of the said invention is/are Helmut DÜWELSHOFT, Haupstrasse 5, 3060 Stadthagen, Germany.

5. The facts upon which the applicant(s) is/are entitled to make this application are as follows:

This form may be completed and filed after the filing of a patent application but the form shall not be signed until after it has been declared.

Slide rail assemblies embodying the invention will
10. A guide rail assembly comprising two guide rails of similar cross-section, each guide rail having a U-shaped portion and a flanged portion extending away from the free end of one leg of the U-shaped portion, one rail having its U-shaped portion inverted and its flanged portion depending downwardly therefrom, the other rail having its U-shaped portion engaged by said downwardly depending flange portion and its flanged portion extending upwardly into engagement with said inverted U-shaped portion, whereby the two rails are constrained for relative longitudinal movement.
COMPLETE SPECIFICATION
(ORIGINAL)
FOR OFFICE USE

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Int. Cl.:

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Complete Specification—Lodged:
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Related Art:

TO BE COMPLETED BY APPLICANT

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Complete Specification for the invention entitled: SLIDE RAIL ASSEMBLIES

The following statement is a full description of this invention, including the best method of performing it known to me:

PF/CPIF/2/80
According to the invention, there is provided a slide rail assembly for a vehicle seat comprising two pairs of guide rails arranged in spaced parallel relationship, the two rails of each pair being in sliding engagement with one another, one rail of each pair being arranged to be connected to a vehicle seat and to act as a guided rail, the other rail of each pair being arranged to be connected to the vehicle floor and to act as a guiding rail, the guiding rail and the guided rail of each pair being of similar cross-sectional shape, and having a U-shaped portion and a flanged portion, the flanged portion of the guiding rail engaging in the U-shaped portion of the guided rail and the flanged portion of the guided rail engaging in the U-shaped portion of the guiding rail.

According to the invention, there is further provided a guide rail assembly comprising two elongate guide rails of similar cross-section, each guide rail having a U-shaped portion and a flanged portion extending away from the free end of one leg of the U-shaped portion, one rail having its U-shaped portion inverted and its flanged portion depending downwardly therefrom, the other rail having its U-shaped portion engaged by said downwardly depending flange portion and its flanged portion extending upwardly into engagement with said inverted U-shaped portion, whereby the two rails are constrained for relative longitudinal movement.
Slide rail assemblies embodying the invention will now be described, by way of example, with reference to the accompanying diagrammatic drawing in which:

Figure 1 is a perspective view of a slide rail assembly of a vehicle seat;

Figure 2 is a cross-section through another form of a slide rail assembly;

Figure 3 is a perspective view, part cut away, of a third form of a slide rail assembly;

Figure 4 is a perspective view, part cut away, of a fourth form of a slide rail assembly; and

Figure 5 is a cross-section through a fifth form of a slide rail assembly.

The slide rail assembly shown in Figure 1 has two mutually parallel slide rail pairs (only a single pair being shown). Each slide rail pair consists of a guided rail 1 and a guiding rail 2. A vehicle seat (not shown) is directly or indirectly secured to the guided rail 1. For an indirect securing, plates 3 are provided on each rail 1, which plates are secured to the vehicle seat, for example by a bolt, by a rivet or by a welded connection.

Each guiding rail 2 is directly or indirectly mounted on the vehicle floor. Indirect mounting is effected by angled plates 4, rigid with each guiding rail 2 which plates are secured to the vehicle floor by a weld, bolt, or rivet.
Each guided rail 1 has a lower portion or zone 5 of U-shape cross-section, an upper portion or zone in the form of an upstanding flange 6 and an intermediate portion or zone 7 interconnecting the upper and lower zones in an offset relationship to one another.

Each guiding rail 2 has an upper zone 8 of inverted U-shape cross-section, a lower zone in the form of a downwardly depending flange 10 and an intermediate zone 9 interconnecting the upper and lower zones in offset relationship with one another.

As the drawing clearly shows, the guiding rail 2 and the guided rail 1 both have the same cross-sectional configuration. It will be appreciated therefore that both rails can be taken from the same profile stock and that stocks of different rails are not needed.

It will also be appreciated that because the flange 6 of the guided rail 1 engages the U-shaped upper zone 8 of the guiding rail 2 and because the flange 10 of the guiding rail engages the U-shaped lower zone 5 of the guided rail 1 a double interlocking is achieved. This double interlocking even when subject to very high stresses, for example during road accidents, will prevent the release of the two rails 1 and 2 from one another.

In the forms of guide rail assembly shown in Figs. 2 to 5 parts similar to those in Fig. 1 are similarly referenced.
In the assemblies of Figures 2 and 4 the offset zones 7 and 9 define an intermediate space 11. In the assembly of Figure 2 this intermediate space 11 accommodates rolling bodies in the form of rolling ball bearings 12, mounted in a cage (not shown). Other forms of roller body construction can be used instead.

In Figure 4 the intermediate space 11 accommodates a round cord 13 of elastic or resilient material, for example of synthetic resin or rubber.

In the assembly shown in Figure 2 a latch 16 is pivotally secured to a plate 3 rigid with the guided rail 7. The latch 16 has a finger arranged to engage aligned openings 14 and 15 in the two walls of the U-shaped lower zone 5. A series of openings are provided in the lower flange 10 of the guiding rail 2 which can be engaged by the finger when aligned with the openings 14 and 15. In this way the rails of the guide assembly can be locked in different longitudinal positions.

As shown in Figure 1, members 17 and 18 of elastic material are provided in respective U-shaped zones of the two rails. Each member 17 and 18 is slidingly engaged by a respective one of the two flanges 6 and 10.

In the assembly shown in Figure 2 only a single member 17 of elastic material is provided and that in the guide 2.
In the assembly shown in Figure 5 the guided rail 1 is secured to the vehicle seat 19 and the guiding rail 2 is mounted indirectly on the vehicle floor by means not shown. Plates 4 are mounted on the upper U-shaped zone 5 of the guiding rail 2 while cover plates 3 are mounted on the lower U-shaped zone 5 of the guided rail 2. The connection of the cover plate 3 to the zone 5 of the guided rail 1 is a rivet connection 20. The connection of the plates 4 to the zone 8 of the guiding rail 2 is a rivet connection 21.

By choosing the rivet connection, screw mounting lugs and locking devices can be avoided.

With previously proposed slide rail guides special screw-receiving lugs and locking devices are welded to the guide rails. Such welds tend to deform the guide rails and impair the running qualities. Thus rattling and/or rough running occurs. The rivet connection described above avoids these difficulties.

In a modification both connections are screw connections. In spite of the relatively large height of the two rails 1 and 2 the location of the vehicle seat between the two pairs of rails can, with the aid of the plates 3,4, be made to be relatively low. Also because of the slim construction of the slide rail assemblies the assemblies can be located laterally of the seat.
The claims.

1. A set of two pairs of relationships, engagement arranged to be connected by guided rails, the resulting being of shaped portions of the guided rail engaging in.

2. An offset from the

3. An intermediate

4. An intermediate
The claims for defining the invention are as follows:

1. A slide rail assembly for a vehicle seat comprising two pairs of guide rails arranged in spaced parallel relationship, the two rails of each pair being in sliding engagement with one another, one rail of each pair being arranged to be connected to a vehicle seat and to act as a guided rail, the other rail of each pair being arranged to be connected to the vehicle floor, and to act as a guiding rail, the guiding rail and the guided rail of each pair being of similar cross-sectional shape, and having a U-shaped portion and a flanged portion, the flanged portion of the guiding rail engaging in the U-shaped portion of the guided rail and the flanged portion of the guided rail engaging in the U-shaped portion of the guiding rail.

2. An assembly according to claim 1, wherein each rail has an intermediate portion connecting the U-shaped portion and the flanged portion so that the U-shaped portion lies offset from the flanged portion.

3. An assembly according to claim 2, wherein the two intermediate portions lie one above the other.

4. An assembly according to claim 3, wherein the two intermediate portions are spaced from one another to
accommodate an elongate member of resilient material and having a circular cross-section.

5. An assembly according to claim 3, wherein the two intermediate portions are spaced from one another to accommodate ball bearings.

6. An assembly according to any preceding claim, including a latch arranged to engage openings in the U-shaped portion of the one rail and one of a plurality of openings in the flange portion of the other rail, when that opening is aligned with said two openings, whereby to lock the two rails against relative longitudinal displacement.

7. An assembly according to any preceding claim, including a member of resilient material located between the flange portion of one rail and the U-shaped portion of the other rail.

8. An assembly according to any preceding claim, wherein plates are secured to the U-shaped portion of each guided rail to secure each guided rail to the vehicle seat, and wherein plates are secured to the U-shaped portion of each guiding rail to secure each guiding rail to the vehicle floor.
9. An assembly according to claim 8, wherein the plates are secured to the rails by rivet connections.

10. A guide rail assembly comprising two guide rails of similar cross-section, each guide rail having a U-shaped portion and a flanged portion extending away from the free end of one leg of the U-shaped portion, one rail having its U-shaped portion inverted and its flanged portion depending downwardly therefrom, the other rail having its U-shaped portion engaged by said downwardly depending flange portion and its flanged portion extending upwardly into engagement with said inverted U-shaped portion, whereby the two rails are constrained for relative longitudinal movement.

11. An assembly according to claim 10 wherein said flanged portion extends parallel to but is offset from said one leg of the U-shaped portion.

12. A slide rail assembly substantially as hereinbefore described with reference to Figure 1 of the accompanying drawings.

13. A slide rail assembly substantially as hereinbefore described with reference to Figure 2 of the accompanying drawings.
14. A slide rail assembly substantially as hereinbefore described with reference to Figure 3 of the accompanying drawings.

15. A slide rail assembly substantially as hereinbefore described with reference to Figure 4 of the accompanying drawings.

16. A slide rail assembly substantially as hereinbefore described with reference to Figure 5.

DATED THIS 1ST DAY OF DECEMBER, 1981.

Günther REMMERBACH, Günther SCHMID, Dieter HILMER and Herbert WAGNER.

By Their Patent Attorneys:

CLEMENT HACK & CO.