

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements relating to Laminated Springs

5 We, J. BROCKHOUSE & COMPANY, LIMITED, a British Company, of Victoria Works, Hill Top, West Bromwich, in the County of Stafford, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to laminated springs of the kind employed in vehicle, particularly road vehicle, suspension and is concerned with the provision of an improved form of anti-friction element for insertion between the leaves of such springs.

15 With laminated springs for road vehicles the individual leaves are normally clamped together at the centre of the assembly with the ends of the main leaf connected in some suitable manner to the chassis of the vehicle.

20 The ends of the remaining leaves are free to move relatively to one another and the efficiency of the spring depends to a large extent upon the degree and freedom of movement of these free ends.

25 The movement of these ends is governed to a large extent by the frictional resistance between the adjacent leaves, and, in order to minimize this resistance, it has been the practice to insert between adjacent leaves an anti-friction element or button. Such anti-friction elements or buttons have been made of metal and are in the form of a disc having a central locating projection, which is adapted to engage in a suitable hole or opening formed adjacent the end of a leaf.

35 With a locating projection of this type the element is prevented from sliding relatively to the leaf with which the projection engages, but relative sliding movement occurs between the one face of the element and the adjacent leaf. With a metal element it is, therefore, necessary to overcome the friction between the disc like element and the adjacent leaf and, to this end, it has been proposed to make metal elements from a porous metal so that they will retain lubricant.

40 It is however, necessary to keep the spring assembly lubricated in order to keep the friction as low as possible and in order to prevent squeaking caused by the relative sliding movement between the anti-friction element

and the adjacent leaf.

As is well known, the chief cause of wear in spring leaves is the large number of tiny oscillations rather than the relatively small number of deep deflections. These oscillations give an almost continuous abrasive action on the spring leaf and unless gaiters are fitted, mud is thrown on to the spring and this mixes with the lubricant to form a grinding compound which aggravates the abrasive action.

65 Furthermore it is difficult and expensive at the present time to provide anti-friction elements made of a suitable porous metal.

It is therefore the object of the present invention to provide an anti-friction element for use with laminated springs which element will overcome the disadvantages associated with metal anti-friction elements as heretofore used.

70 According to the present invention the elements are made of a material which is a solid polymer of ethylene of high molecular weight produced by polymerisation of gaseous ethylene under high pressure, the material being known as polythene and said element being provided with locating means for retaining it in its operative position relative to said leaves.

80 The elements are preferably in the form of circular discs having a cylindrical projection at the centre and this projection may be of hollow form so that it can contain grease or other lubricant or alternatively the one face of the disc may be provided with a number of concentric grooves for containing lubricant.

85 Due to the elasticity of polythene, these elements act as cushions between the leaves and avoid point or line contacts which cause stress concentrations and squeaks. Line contact allows the spring leaf tip to dig a notch in the adjacent leaf, leading to premature failure, but these elastic elements spread the load uniformly over the area of the disc.

The invention is illustrated in the accompanying drawing wherein:—

90 Figure 1 is a side elevation of a complete leaf spring assembly.

95 Figure 2 is a sectional detail to an enlarged scale showing one end of the assembly.

[Price 2s. 8d.]

Figure 3 is a sectional view of an alternative form of element, and

Figure 4 is a similar view of a further alternative form of element.

5 In the form of our invention illustrated the spring assembly is shown as comprising three leaf springs 10 the upper one of which is provided at each end with a rolled over portion 11 whereby it may be secured to the body of 10 the vehicle and the lower two leaf springs are provided with straight ends. As shown more clearly in Figure 2 each of the lower leaves 10 is provided near each end with a central circular opening 12 in which engages a cylindrical projection 13 formed centrally on the 15 spacing element 14 which is in the form of a circular disc. The element 14 is thus anchored securely between the adjacent leaves of the spring so that it will not work 20 loose due to the relative movement between the leaves. These elements 14 are made of polythene that is to say a solid polymer of ethylene of high molecular weight produced by polymerisation of gaseous ethylene under 25 high pressure, and this material is not only extremely hard wearing but also has a low co-efficiency of friction and is unaffected by the presence of oil or grease.

30 Preferably the diameter of each element 14 is somewhat less than the width of the spring leaves 10 but if desired the diameter of each element 14 may be equal to the width of the spring leaves.

35 In order to provide lubrication between the elements 14 and the leaves 10 should this be deemed desirable the upper surface of each element 14 may be provided with a number of concentric grooves 15 as shown in Figure 3 in which lubricant can be contained or 40 alternatively the central projection 13 of each element 14 may be provided with a hollow portion 16 in which lubricant may be contained or in which may be placed an absorbent washer or pad 17 which is saturated

with lubricant.

45 Such a spacing element or anti-friction element as has been described above is not only considerably cheaper to produce than those which have heretofore been produced but has extremely good anti-friction properties, is 50 silent in its operation and is not attacked in any way by the presence of oil or grease so that it has a long and effective life.

What we claim is:—

1. An anti-friction element for use between 55 the leaves of laminated springs made from a material which is a solid polymer of ethylene of high molecular weight produced by polymerisation of gaseous ethylene under high 60 pressure, the material being known as polythene said element being provided with locating means for retaining it in its operative position relative to said leaves.

2. An element according to Claim 1 which is in the form of a circular disc having a 65 cylindrical projection at the centre the projection being adapted to engage in a hole in the leaf of a spring.

3. An element according to Claim 2 wherein the upper surface of the element is 70 provided with a plurality of concentric grooves adapted to contain lubricant.

4. An element according to either of Claims 2 or 3 wherein the central projection is of hollow form and is adapted to contain 75 lubricant or an absorbent pad or washer saturated with lubricant.

5. An anti-friction element for use between the leaves of laminated springs substantially 80 as hereinbefore described with reference to and as illustrated in Figures 1 and 2 or Figure 3, or Figure 4 of the accompanying drawing.

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PROVISIONAL SPECIFICATION

Improvements relating to Laminated Springs

85 We, J. BROCKHOUSE & COMPANY, LIMITED, a British Company, of Victoria Works, Hill Top, West Bromwich, in the County of Stafford, do hereby declare this invention to be described in the following statement:—

90 This invention relates to laminated springs and is primarily intended for application to the kind of spring employed in vehicle, particularly road vehicle, suspension wherein elements are provided for insertion between the spring leaves, which elements serve to 95 space the leaves apart and to decrease the friction between them.

Such elements made of metal are known and have taken the form of circular discs having a cylindrical projection at the centre,

the projections of the elements engaging in 100 holes in the leaves.

The object of the present invention is to provide an improved construction.

105 According to the present invention the elements are made of a material which is a solid polymer of ethylene of high molecular weight produced by polymerisation of gaseous ethylene under high pressure, the material being known as polythene.

110 Colloidal graphite or other lubricating material may be mixed with the ethylene and the elements may be produced by moulding such a mixture.

The central projection of each element may be of cup-like form for containing grease or

other lubricant, or for containing an absorbent washer or pad saturated with lubricant.

5 The disc may be of uniform thickness except at the centre where the central projection is provided at one side, and the diameter of the disc may be equal to or somewhat less than the width of the spring leaves. The elements may be inserted between the end portions of the leaves with the cylindrical

projections extending downwardly into holes 10 in the leaves.

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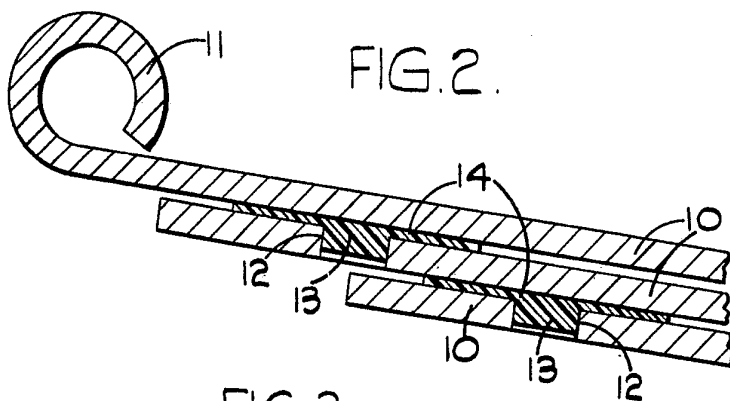
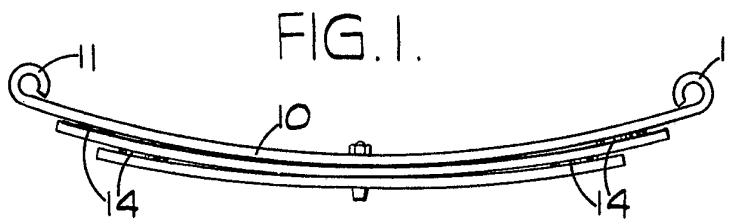


FIG. 3.

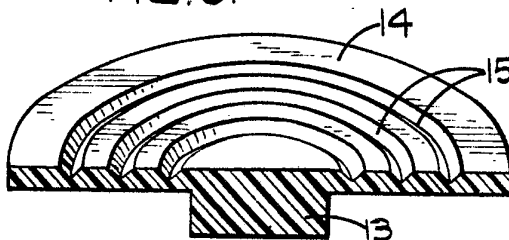


FIG. 4.

