

Description

Title of Invention: BALANCE WEIGHT PARALLEL BODY

Technical Field

[0001] The present invention relates to a balance weight parallel body to be used by being bonded to a rim portion of a wheel of an automobile so as to keep weight balance of the wheel.

Background Art

[0002] A wheel of an automobile circulates about an axle shaft. When wheel balance is disturbed, vibration occurs as a rotation speed increases. In view of the foregoing, a lightweight portion of the wheel is detected by inspection with a balancer, and a balance weight having a required weight is mounted on the portion, to thereby keep wheel balance.

[0003] In the related art, as the balance weight, there has been proposed a clip-type balance weight (see, for example, Patent Literature 1 and Patent Literature 2). The clip-type balance weight has a configuration in which one end of a clip formed of a member of a metal such as iron or stainless steel is fixed to (for example, embedded in) a weight. The clip-type balance weight is mounted on a rim by placing the weight on a dent of a rim flange, sandwiching an end portion of the rim flange between the weight and the clip, and hammering the weight with a hammer or the like.

The weight is formed of a lead member in most cases, but in

recent years, from the viewpoint of environmental protection (prevention of pollution caused by lead), the lead member is replaced by a material other than the lead member, for example, iron, copper, a compounded body of a metal and a rubber, or a compounded body of a metal and resin.

[0004] The clip-type balance weight is mounted on the rim by hammering the weight with a hammer while sandwiching the end portion of the rim flange between the weight and the clip, and hence there is inconvenience that the rim is liable to be damaged. In particular, an aluminum rim is made of a soft material, and hence occurrence of a flaw impairs the aesthetic appearance of the entire wheel. Further, there is also a problem, for example, in that mounting workability of the balance weight is poor.

[0005] In order to solve the above-mentioned problems, there has hitherto been proposed a balance weight having a configuration in which cutting vertical grooves for partitioning a front surface and a back surface of the balance weight main body having a horizontally long rectangular shape by 10 g or 5 g are formed on the front surface and the back surface, and a pressure-sensitive adhesive tape having a separator is bonded to the entire back surface (see, for example, Patent Literature 3). With this, the separator is peeled, and balance weight pieces corresponding to the required weight are cut off along the cutting vertical grooves. The balance weight pieces thus obtained can be fixed to a rim portion through intermediation of a pressure-sensitive adhesive.

[0006] In the above-mentioned case, mounting operation of the balance weight becomes relatively simple, and there is no risk in that the rim portion is damaged. Further, the balance weight is formed of one lead plate. Therefore, for example, when 20 g of the balance weight is required, the balance weight is cut off along four vertical grooves partitioned by 5 g, and the balance weight pieces thus obtained are bonded to the rim portion of a wheel with the pressure-sensitive adhesive, to be used. Thus, although the 20 g of the balance weight has the cutting vertical grooves, the entire balance weight is integrally formed. Therefore, this configuration is convenient when the balance weight is peeled from the rim portion of the wheel at the time of replacement or re-adjustment, because the entire balance weight can be peeled by peeling from one end.

[0007] However, the above-mentioned bonding-type balance weight is formed of one lead plate, and hence the balance weight needs to be cut off along the cutting vertical grooves through use of a special cutting tool, for example, special scissors at the time of use (see, for example, Patent Literature 6). In view of the foregoing, there has been proposed a balance weight having the following configuration (see, for example, Patent Literature 4 and Patent Literature 5). As illustrated in FIG. 5, a plurality of weights 11, each having, for example, a small rectangular plate shape and having a predetermined weight (for example, 5 g or 10g), are arranged in a row (arrayed) on a release sheet (release tape)

13 through intermediation of a pressure-sensitive adhesive 12. A required number of the weights 11 are peeled from the release sheet 13 at the time use and bonded to a rim portion 15 having a tire 14 mounted thereon with the pressure-sensitive adhesive 12 as illustrated in FIG. 6. With this, the weights are separated one by one and are arranged in a row. Therefore, cutting operation is not required at the time of use, and it is only necessary that a required number of the weights 11 be peeled and bonded. Thus, mounting operation of the balance weight becomes significantly simple, and there is no risk in that the rim portion is damaged.

[0008] As described above, in the balance weight as illustrated in FIG. 5, the weights 11 are separated to be independent one by one. The plurality of weights 11 are arranged in a row on the release sheet (release tape) 13 through intermediation of the pressure-sensitive adhesive 12, and a required number of the weights 11 are peeled from the release sheet 13 at the time of use and bonded and fixed to the rim portion 15. Meanwhile, the weights 11 bonded and fixed to the rim portion need to be peeled from the rim portion 15 of a wheel, for example, at the time of replacement or re-adjustment. In this case, the plurality of weights 11 are arranged in a row and bonded and fixed to the rim portion 15, the weights 11 being separated to be independent, as illustrated in FIG. 6. Therefore, the weights 11 are peeled one by one, and all the weights 11 cannot be peeled at a time as in the weight disclosed in Patent Literature 3. Thus, time, effort, and trouble are taken for peeling operation,

with the result that peeling workability is poor.

[0009] In particular, when the above-mentioned balance weight is used under a state in which the plurality of weights 11 are arranged in a row, in order to enable curvature corresponding to curvature of the rim portion 15 or to wind the balance weight in a spiral shape so that the balance weight can be stored as illustrated in FIG. 8 of Patent Literature 5, each of the weights 11 is formed into a trapezoidal shape, and the weights 11 are brought into contact with each other only at lower ends, with the result that a gap is formed between the weights 11 and 11 in an upper region from a lower surface end portion. Therefore, although the weights 11 arranged in a row can be easily separated one by one, it is difficult to peel all the plurality of weights 11 arranged in a row and bonded to the rim portion at a time.

[0010] Meanwhile, in Patent Literature 7, the applicant of the present application has proposed a balance weight parallel body that enables all the plurality of weights arranged in a row and bonded to the rim portion of the wheel to be peeled from the rim portion at a time. Such balance weight parallel body has a configuration in which a plurality of weights, each having a predetermined weight, are arrayed so as to be adjacent to each other on a long band-shaped release tape through intermediation of a pressure-sensitive adhesive layer, and one or more peeling wire bodies held in the pressure-sensitive adhesive layer are formed between the weights and the release tape.

[0011] In the balance weight parallel body having such configuration, the peeling wire body is formed so as to be held in the pressure-sensitive adhesive layer on a lower surface side of the weights. Therefore, when the weights bonded to the rim portion of the wheel are peeled from the rim portion, all the weights can be easily peeled from the rim portion at a time by holding up a distal end portion of the wire body with the fingers.

Citation List

Patent Literature

- [0012] [PTL 1] JP 52-45901 U1
[PTL 2] JP 58-81803 A
[PTL 3] JP 50-91201 U1
[PTL 4] JP 3055185 U
[PTL 5] US 3960409
[PTL 6] JP 3019263 U
[PTL 7] JP 2013-190094 A

Summary of Invention

Technical Problem

[0013] However, in the above-mentioned balance weight parallel body using the peeling wire body, the peeling wire body is embedded in the pressure-sensitive adhesive layer, and hence there is the following problem. When the weights are peeled from the rim portion by holding up one end portion of the wire body with the fingers,

the contact area between the pressure-sensitive adhesive and the wire body in the pressure-sensitive adhesive layer is small, and hence the retention force of the wire body in the pressure-sensitive adhesive layer becomes insufficient. Then, the wire body moves from the vicinity of an intermediate portion of the thickness of the pressure-sensitive adhesive layer to an upper portion thereof while cutting the pressure-sensitive adhesive and further moves so as to be exposed outside from the pressure-sensitive adhesive layer. Finally, the wire body itself directly supports a part of the weight, which is biased to one side from the center of the weight lower surface. As a result, the peeling force of the wire body cannot be sufficiently and effectively applied to the entire weight lower surface and pressure-sensitive adhesive layer, and all the weights cannot be smoothly and rapidly peeled from the rim portion at a time in some cases. In addition, it is considered that the following problems may occur. A part of the pressure-sensitive adhesive remains on the rim portion to make it necessary to perform removal operation of the pressure-sensitive adhesive. Further, replacement (bonding) operation and adjustment operation of the weights at that site become cumbersome, and the bonded state of the weights to be replaced or adjusted becomes incomplete.

[0014] The present invention has been made in view of the above-mentioned related-art problems, and an object of the present invention is to provide a balance weight parallel body in which, when a plurality of weights are bonded to a rim portion of a wheel

so as to be arranged in a row, all the weights bonded to the rim portion can be completely peeled from the rim portion of the wheel at a time.

Solution to Problem

[0015] In order to achieve the above-mentioned object, a balance weight parallel body of the present invention includes: a plurality of rectangular weights each having a predetermined weight, the plurality of rectangular weights being continuously arranged so as to be adjacent to each other on a long band-shaped release tape through intermediation of a pressure-sensitive adhesive layer; and one or more peeling band-shaped bodies embedded in the pressure-sensitive adhesive layer formed between the plurality of rectangular weights and the long band-shaped release tape in a direction in which the plurality of rectangular weights are continuously arranged so as to be adjacent to each other.

[0016] With the above-mentioned configuration, when a required number of the weights are peeled from the release tape and bonded to a rim portion, the peeling band-shaped body held in the pressure-sensitive adhesive layer is formed on a lower surface side of the bonded plurality of weights. When one end portion of the band-shaped body is held up with the fingers in order to peel those weights, the band-shaped body is in contact with the pressure-sensitive adhesive layer in which the band-shaped body is embedded in a wide surface. Therefore, the plurality of weights

bonded to the pressure-sensitive adhesive layer can be completely peeled together with the pressure-sensitive adhesive layer at a time without separating the plurality of weights. Thus, it becomes possible to perform peeling operation of the weights easily and rapidly.

[0017] In the balance weight parallel body of the present invention, the one or more peeling band-shaped bodies are each formed of a synthetic resin film.

[0018] With the above-mentioned configuration, when the band-shaped body formed of a synthetic resin film is embedded in the pressure-sensitive adhesive layer, the synthetic resin film being selected from, for example, polyethylene (PE) that is lighter than water and is excellent in water resistance, chemical resistance, and toughness, polypropylene that is excellent in heat resistance and mechanical strength, an ABS resin that is excellent in impact resistance, and polyethylene terephthalate (PET) that is excellent in oil resistance, toughness, chemical resistance, and the like, all the plurality of weights bonded to the pressure-sensitive adhesive layer can be separated (peeled) from the rim portion at a time by pulling up the plurality of weights from the rim portion together with the pressure-sensitive adhesive layer so as to peel the band-shaped body. Further, the synthetic resin film is held on the rim portion under a state of being embedded in the pressure-sensitive adhesive layer. In this case, all the weights can be separated from the rim portion at a time by holding up an

end portion of the band-shaped body formed of the synthetic resin film. Further, the synthetic resin film is excellent in corrosion resistance and impact resistance. Therefore, even when the synthetic resin film is exposed to rain and wind and is repeatedly subject to large impact during running of a vehicle, there is no concern that the quality of the synthetic resin film is deteriorated, and the synthetic resin film can stably hold the weights on the rim portion together with the pressure-sensitive adhesive layer for a long time period. In particular, the synthetic resin film is excellent in toughness even when the thickness thereof is significantly small, and hence a thin synthetic resin film can be adopted. Even when the synthetic resin film is embedded in the pressure-sensitive adhesive layer, the synthetic resin film is not exposed from the pressure-sensitive adhesive layer to the rim portion side to inhibit pressure-sensitive adhesive strength (adhesive strength) of the pressure-sensitive adhesive layer.

[0019] In the balance weight parallel body of the present invention the one or more peeling band-shaped bodies are each formed of a metal sheet having high flexibility and high strength.

[0020] With the above-mentioned configuration, the metal sheet has high strength although not having stretchability. Therefore, when the metal sheet is embedded in the adhesive layer, the metal sheet can stably support the plurality of weights on the rim portion through intermediation of the pressure-sensitive adhesive layer and enable all the plurality of weights bonded to the rim portion

to be peeled therefrom at a time.

[0021] In the balance weight parallel body of the present invention the one or more peeling band-shaped bodies are each formed of mixed fabric having high toughness.

[0022] With the above-mentioned configuration, through use of the mixed fabric having flexibility and toughness, the weights on the mixed fabric can be reliably and rapidly peeled from the rim portion together with the pressure-sensitive adhesive layer in which the mixed fabric is embedded by virtue of the ease of holding of the mixed fabric.

[0023] In the balance weight parallel body of the present invention, the plurality of rectangular weights are continuously arranged so as to be adjacent to each other, and each have side surfaces adjacent to each other formed into an inclined surface or an arc surface enabling curvature between the adjacent rectangular weights.

[0024] With the above-mentioned configuration, the plurality of weights, which are arrayed so as to be adjacent to each other, have the side surfaces adjacent to each other, the side surfaces each being formed into the inclined surface or the arc surface enabling curvature between the weights. Therefore, when the plurality of weights, which are arrayed so as to be adjacent to each other, are bonded to the rim portion of the wheel with the pressure-sensitive adhesive layer side facing the rim portion side surface, even in

the case where there are various diameters of wheels (also including rim portions), and a curvature degree of the rim portion varies, the weights can be curved along curved surfaces of all the rim portions and can be adapted to all the wheels even when diameters thereof are different. Further, in the balance weight parallel body, the side surfaces adjacent to each other of the weights each have a shape enabling curvature between the weights. Therefore, the balance weight parallel body can be wound in a spiral shape, which is convenient for handling, conveyance, storage, and the like.

[0025] As the inclined surface or the arc surface with which the side surfaces adjacent to each other of the weights enable curvature between the weights, there may be given, for example, (a) a form in which the weights each have a trapezoidal shape, and the weights continue in an adjacent direction with lower end sides of the trapezoids being brought into contact with each other, (b) a form in which the side surfaces adjacent to each other of the weights are each formed into an arc surface, and the weights continue in an adjacent direction with the arc surfaces being brought into contact with each other at apexes thereof, and (c) a form in which the side surfaces adjacent to each other of the weights are each formed into a chevron surface, and the weights continue in an adjacent direction with the chevron surfaces being brought into contact with each other at apexes thereof.

Advantageous Effects of Invention

[0026] The balance weight parallel body of the present invention exhibits the following effects.

(1) When a required number of the weights are peeled from the release tape and bonded to the rim portion, the peeling band-shaped body having a large contact area with respect to the peeling pressure-sensitive material held in the pressure-sensitive adhesive layer is present on the lower surface side of the bonded plurality of weights. When the weights are peeled, the weights can be peeled at a time without separating the adjacent weights by pulling up the weights from the release tape and further from the rim portion of the wheel on which the weights are bonded, together with the pressure-sensitive adhesive layer, while holding up one end of the peeling band-shaped body, with the result that easy and rapid peeling operation of the weights can be performed. Further, through use of the synthetic resin film, the metal sheet, or the mixed fabric having high toughness as the peeling band-shaped body, by virtue of corrosion resistance, impact resistance, weather resistance, water resistance, and operability thereof, the weights can be stably held on the rim portion for a long time period. Meanwhile, the weights can be reliably and rapidly peeled from the rim portion.

[0027] (2) In particular, as the peeling band-shaped body, even a band-shaped body having a significantly small thickness (for example, a synthetic resin film) has toughness, and hence a significantly thin band-shaped body can be adopted. Even when such significantly thin band-shaped body is embedded in the

pressure-sensitive adhesive layer, the band-shaped body is not exposed to be brought into contact with the rim portion surface and hence does not inhibit the pressure-sensitive adhesive strength (adhesive strength) of the pressure-sensitive adhesive layer.

(3) Further, the weights that continue in an adjacent direction have side surfaces adjacent to each other, the side surfaces each being formed into the inclined surface or the arc surface enabling curvature between the weights. Therefore, when the plurality of weights, which are arrayed so as to be adjacent to each other, are bonded to the rim portion of the wheel with the pressure-sensitive adhesive layer side facing the rim portion side surface, the weights can be brought into abutment against the rim portion so as to be along curved surfaces of all the rim portions having various curvature degrees. Further, the long balance weight parallel body can be wound in a spiral shape, which is convenient for handling, conveyance, storage, and the like.

[0028] The present invention has been briefly described above. Further, the best mode for carrying out the present invention is described in detail hereinbelow with reference to the accompanying drawings.

Brief Description of Drawings

[0029] FIG. 1 is a perspective view for illustrating a balance weight parallel body according to an embodiment of the present invention.

FIG. 2 is an enlarged sectional view for illustrating main portions of the balance weight parallel body according to the embodiment of the present invention.

FIG. 3 is a perspective view for illustrating a balance weight parallel body according to another embodiment of the present invention.

FIG. 4(a) is a sectional view for illustrating a usage state of the balance weight parallel body according to the embodiment of the present invention. FIG. 4(b) is a sectional view for illustrating a peeling state.

FIG. 5 is a perspective view for illustrating the related art.

FIG. 6 is a perspective view for illustrating a usage state of the related art.

Description of Embodiments

[0030] Now, a balance weight parallel body according to an embodiment of the present invention is described in detail with reference to the drawings. FIG. 1 is a perspective view for illustrating the balance weight parallel body according to the embodiment of the present invention, and FIG. 2 is an enlarged sectional view for illustrating main portions of the balance weight parallel body according to the embodiment of the present invention.

[0031] In the balance weight parallel body according to this embodiment, rectangular weights 1 each having a predetermined weight are arrayed so as to be adjacent to each other and continue in the

adjacent direction on a long band-shaped release tape 3 through intermediation of a pressure-sensitive adhesive layer 2, and one peeling band-shaped body 4 held so as to be embedded in the pressure-sensitive adhesive layer 2 is formed between the weights 1 and the release tape 3 in the adjacent direction of the plurality of weights 1.

[0032] Each of the weights 1 is made of a metal piece having a weight, such as lead or iron, and the metal piece is obtained, for example, by processing a large metal plate into a rectangular pellet-shaped metal piece having several centimeters in height and width and having a predetermined weight (for example, 5 g or 10g) by pressing or the like. Further, the metal piece has a predetermined thickness. A thickness portion of the weight 1 in this embodiment when viewed from a side has a trapezoidal shape as illustrated in FIG. 2. It is preferred that corners, at which an upper surface, a front surface, a back surface, and a side surface of the weight 1 continue, be each formed into a smooth arc surface (R surface), because the weight 1 can be prevented from damaging a rim portion of a wheel and does not injure the hand of a user during handling. The weights 1 are each formed so as to have the same shape, size, and weight, and for example, characters of a material (for example, "Fe") and a weight (for example, "5 g") are engraved on each upper surface. The plurality of weights 1 having the above-mentioned configuration are bonded to the band-shaped release tape 3 through intermediation of the pressure-sensitive adhesive layer 2 so as

to be arranged in a row.

[0033] The peeling band-shaped body 4 is formed in an array direction of the weights 1 in such a manner as to be embedded in the pressure-sensitive adhesive layer 2 between lower surfaces of the weights 1 and the release tape 3. In the illustrated embodiment, a case of one peeling band-shaped body 4 is illustrated. When the weights 1 on the release tape 3 are peeled, the peeling band-shaped body 4 is used for peeling all the weights 1 from the weight 1 positioned on an end portion side as illustrated in FIG. 4(b) even when there are the bonded plurality of weights 1. Therefore, it is necessary that the peeling band-shaped body 4 have strength capable of peeling the weights 1 against the pressure-sensitive adhesive strength of the pressure-sensitive adhesive layer 2. Further, the same action and effects are obtained also when the weights 1 bonded to a rim portion 5 through intermediation of the pressure-sensitive adhesive layer 2 are peeled.

[0034] As the belt-like body 4 for stripping, synthesized resin films, such as polyethylene (PE) which is lighter than water and excellent in water resistance, chemical resistance, and stiffness, polypropylene which is excellent in heat resistance and has high mechanical strength, an ABS resin which is excellent in impact resistance, and ethylene terephthalate (PET) which is excellent in stiffness, oil resistance, and chemical resistance, may be selected and used in accordance with the form of a wheel or a rim portion, or the type of vehicle in which the wheel is used (e.g.,

an industrial haulage vehicle, a maintenance vehicle, or a passenger vehicle).

[0035] When the band-shaped body 4 formed of the synthetic resin film selected from the foregoing is embedded in the pressure-sensitive adhesive layer 2, all the weights 1 can be separated (peeled) from the release sheet 3 or the rim portion 5 to which the weights 1 are bonded at a time under a state in which all the weights 1 are supported on the wide band-shaped body 4 by pulling up the plurality of weights 1 bonded to the pressure-sensitive adhesive layer 2 together with the pressure-sensitive adhesive layer 2 so as to peel the band-shaped body 4. Further, the band-shaped body 4 formed of the synthetic resin film is held on the rim portion 5 under a state of being embedded in the pressure-sensitive adhesive layer 2 but is not deteriorated in form and quality even when being subject to repeated large impact during running of a vehicle by virtue of excellent corrosion resistance and impact resistance. Therefore, the band-shaped body 4 can stably hold the weights 1 on the rim portion 5 together with the pressure-sensitive adhesive layer 2.

[0036] Further, when the weights 1 bonded to the rim portion 5 are replaced or adjusted, it is necessary to peel the weights 1 from the rim portion 5 together with the pressure-sensitive adhesive layer 2. In this case, all the weights 1 can be separated from the rim portion 5 at a time also by holding up an end portion of the peeling band-shaped body 4.

[0037] Further, as the peeling band-shaped body 4, a rust-proof metal sheet being excellent in flexibility and having high strength, for example, an aluminum sheet can also be used. The aluminum sheet is lightweight and has satisfactory corrosion resistance, and has high strength although having small stretchability. Therefore, when the aluminum sheet is embedded in the pressure-sensitive adhesive layer 2, a corrosion resistance effect is given, and all the weights 1 on the pressure-sensitive adhesive layer 2, which is in contact with the wide metal sheet in a large area, can be peeled from the rim portion 5 together with the pressure-sensitive adhesive layer 2 at a time.

[0038] Further, as the peeling band-shaped body 4, mixed fabric excellent in toughness can be used. As the mixed fabric, natural fibers or synthetic fibers can be used as a material, and it is basically desired that a material excellent in toughness and durability be used. Further, all the weights 1 on the pressure-sensitive adhesive layer 2 can be easily peeled from the rim portion 5 together with the pressure-sensitive adhesive layer 2 by virtue of the ease of holding of the mixed fabric.

[0039] Further, the peeling band-shaped body 4 is formed so as to be embedded in the pressure-sensitive adhesive layer 2 between the lower surfaces of the weights 1 and the release tape 3. Therefore, when the weights 1 are bonded to the rim portion 5 of the wheel, the peeling band-shaped body 4 is positioned in the pressure-sensitive adhesive layer 2 between the lower surfaces of

the weights 1 and the bonding surface of the rim portion 5 of the wheel as illustrated in FIG. 4(a). Thus, the thickness of the peeling band-shaped body 4 is less than a thickness h of the pressure-sensitive adhesive layer 2. In particular, when the weights 1 are bonded to the rim portion 5 of the wheel, and the peeling band-shaped body 4 embedded in the pressure-sensitive adhesive layer 2 is exposed from the pressure-sensitive adhesive layer 2 to be brought into contact with the rim portion 5 surface, the pressure-sensitive adhesion (adhesion) of the pressure-sensitive adhesive layer 2 with respect to the rim portion 5 surface is inhibited. Therefore, it is preferred that the thickness of the peeling band-shaped body 4 be set to be small to the extent possible so as to be completely embedded in the pressure-sensitive adhesive layer 2.

[0040] FIG. 3 is a perspective view for illustrating a balance weight parallel body according to another embodiment of the present invention. In this embodiment, two peeling band-shaped bodies 4a and 4b each having a width smaller than that of the peeling band-shaped body 4 are embedded in the pressure-sensitive adhesive layer 2, and the other configuration is the same as that of the above-mentioned embodiment. Therefore, like constituent elements are denoted by like reference symbols, and repeated description thereof is omitted. The peeling band-shaped bodies 4a and 4b are present on the lower surface side of the weights 1 so as to occupy predetermined regions in contact with the pressure-sensitive adhesive layer 2 in a large area and each have a width of a size capable of separating (peeling)

the weights 1 from the release tape 3 at a time.

[0041] Also in the balance weight parallel body having the above-mentioned configuration, all the weights 1 can be separated (peeled) from the rim portion 5 at a time under a state in which all the weights 1 are supported on the peeling band-shaped bodies 4a and 4b by pulling up the plurality of weights 1 bonded to the rim portion 5 of the wheel from the rim portion 5 so as to hold up and peel one or both end portions of the peeling band-shaped bodies 4a and 4b. In FIG. 2 and FIG. 3, there is illustrated a state in which the end portions of the peeling band-shaped bodies 4 (4a and 4b) are extended outside. However, the end portions are shown as to be extended outside for ease of understanding, and actually, the end portions may or may not be extended outside from a leading end and a trailing end.

[0042] Next, a usage example of the balance weight parallel body according to this embodiment is described with reference to FIG. 4(a) and FIG. 4(b). First, a required number (for example, five) of the weights 1, which are continuously arranged in a row on the release tape 3, are peeled from the release tape 3 and bonded to the rim portion 5 of the wheel with the pressure-sensitive adhesive layer 2 as illustrated in FIG. 4(a). The position of the rim portion 5 at which the weights 1 are bonded is a position of a lightweight portion of a wheel, which is detected with a balancer.

[0043] Meanwhile, when the weights 1 bonded to the rim portion 5 are peeled, an end portion of the pressure-sensitive adhesive

layer 2 is peeled from the release tape 3 through use of a tool or the like as illustrated in FIG. 4(b), and further, the weights 1 and the peeling band-shaped bodies 4 (4a and 4b) are held by the hand and pulled up so as to be peeled. With this, all the weights 1 can be peeled at a time from the weight 1 to which pull-up force is first applied, because the weights 1 positioned on the peeling band-shaped bodies 4 (4a and 4b) are all connected to each other as described above. Thus, it is not necessary to perform operation of peeling the bonded weights 1 one by one with a tool, and peeling operation can be easily and rapidly performed.

[0044] As illustrated in FIG. 3, when two peeling band-shaped bodies 4a and 4b are used as the peeling band-shaped body, the peeling band-shaped bodies 4a and 4b are present in regions each having a predetermined width on the lower surface side of the weights 1. Therefore, the pressure-sensitive adhesive strength of the pressure-sensitive adhesive layer 2 with respect to the release tape 3 can be sufficiently maintained, and the usage amount of the peeling band-shaped bodies can be reduced. In this case, by holding up only one of the peeling band-shaped bodies 4a and 4b or holding up both the peeling band-shaped bodies 4a and 4b simultaneously in accordance with the pressure-sensitive adhesive strength of the pressure-sensitive adhesive layer 2, the peeling band-shaped bodies 4a and 4b can be easily peeled from the release tape 3, and the weights 1 bonded to the rim portion 5 can be rapidly separated therefrom together with the pressure-sensitive adhesive layer 2.

[0045] Further, it is preferred that the weights 1 that continue in the adjacent direction have side surfaces 1a and 1b (see FIG. 2) adjacent to each other, the side surfaces 1a and 1b being each inclined as an inclined surface or an arc surface enabling curvature between the weights 1 and 1. With this, when the plurality of weights 1, which are arrayed so as to be adjacent to each other, are bonded to the rim portion 5 of the wheel with the pressure-sensitive adhesive layer 2, even in the case where there are various diameters of wheels (also including rim portions), and a curvature degree of the rim portion 5 varies, the weights 1 can be curved along curved surfaces of all the rim portions 5 and can be adapted to all the wheels even when diameters thereof are different. Further, the long balance weight parallel body can be wound in a spiral shape, which is convenient for handling, conveyance, storage, and the like.

[0046] For example, the weight 1 according to this embodiment has a trapezoidal shape when viewed from a side as illustrated in FIG. 2. Therefore, the front surface portion 1a and the back surface portion 1b of the weight 1 each form an inclined surface that spreads downward. In the adjacent weights 1 and 1, corners of bottom surfaces of the trapezoids are only in line contact P with each other, and in an upper region therefrom, a gap that is enlarged upward is formed. That is, the corners of the bottom surfaces of the weights 1 are arrayed on a flat surface above the release tape 3 so as to be in line contact with each other through intermediation of the pressure-sensitive adhesive layer 2 and continue in the adjacent

direction. Thus, the balance weight parallel body can be wound in a spiral shape with the weights 1 being positioned on an inner side of the release tape 3, and the plurality of weights 1 that are arranged in a row can also be curved along the rim portion 5.

[0047] As a result, when the plurality of weights 1, which are arrayed so as to be adjacent to each other, are bonded to the rim portion 5 of the wheel with the pressure-sensitive adhesive layer 2, even in the case where there are various diameters of wheels (also including rim portions), and a curvature degree of the rim portion 5 varies, the weights 1 can be curved along curved surfaces of all the rim portions 5 and can be adapted to all the wheels even when diameters thereof are different. In this case, bending angles of the adjacent weights 1 and 1 can be sufficiently set by increasing the inclination angle of each of the inclined surfaces 1a and 1b of the weights 1. With this, the winding diameter of the balance weight parallel body can be decreased. In other words, the bending angles of the adjacent weights 1 and 1 can be adjusted by adjusting the inclination angle of each of the inclined surface 1a and 1b of the weights 1.

Industrial Applicability

[0048] The present invention is useful as a balance weight to be used for a rim portion of a wheel so as to keep weight balance, and further, is useful as a balance weight parallel body in which a plurality of weights arrayed so as to be adjacent to each other,

which are bonded to the rim portion of the wheel with a pressure-sensitive adhesive layer, can be peeled at a time.

Reference Signs List

- [0049] 1 weight
- 1a front surface portion of weight
- 1b back surface portion of weight
- 2 pressure-sensitive adhesive layer
- 3 release tape
- 4, 4a, 4b peeling band-shaped body
- 5 rim portion

Claims

[Claim 1] A balance weight parallel body, comprising: a plurality of rectangular weights each having a predetermined weight, the plurality of rectangular weights being continuously arranged so as to be adjacent to each other on a long band-shaped release tape through intermediation of a pressure-sensitive adhesive layer; and one or more peeling band-shaped bodies embedded in the pressure-sensitive adhesive layer formed between the plurality of rectangular weights and the long band-shaped release tape in a direction in which the plurality of rectangular weights are continuously arranged so as to be adjacent to each other.

[Claim 2] A balance weight parallel body according to claim 1, wherein the one or more peeling band-shaped bodies are each formed of a synthetic resin film.

[Claim 3] A balance weight parallel body according to claim 1, wherein the one or more peeling band-shaped bodies are each formed of a metal sheet having high flexibility and high strength.

[Claim 4] A balance weight parallel body according to claim 1, wherein the one or more peeling band-shaped bodies are each formed of mixed fabric having high toughness.

[Claim 5] A balance weight parallel body according to any one of

claims 1 to 5, wherein the plurality of rectangular weights are continuously arranged so as to be adjacent to each other, and each have side surfaces adjacent to each other formed into an inclined surface or an arc surface enabling curvature between the adjacent rectangular weights.