

TRIGGER FORCE ADJUSTMENT MECHANISM, VEHICLE EMBLEM LIFTING ASSEMBLY AND VEHICLE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present disclosure claims priority to Chinese Patent Application No. 202410204144.2, filed on February 23, 2024, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to, but is not limited to, the field of vehicle technologies, and in particular, to a trigger force adjustment mechanism, a vehicle emblem lifting assembly, and a vehicle.

BACKGROUND

[0003] When a vehicle emblem is subjected to a collision or a manual force, the vehicle emblem needs to retract quickly to a safe position. Therefore, a support structure of the vehicle emblem is required to hold the emblem in place, while generating a downward displacement when an external force is applied to the vehicle emblem. By converting the trigger force into a downward displacement, a clutch mechanism is activated to achieve a rapid retraction. At present, there is no solution that realizes the functions of position holding, displacement transmission, and trigger force adjustment of the vehicle emblem, failing to meet the user's needs.

SUMMARY

[0004] The following is a brief summary of subject matter described in detail herein. This summary is not intended to be limiting as to the scope of the claims.

[0005] The present disclosure provides a trigger force adjustment mechanism, a vehicle emblem lifting assembly, and a vehicle.

[0006] The present disclosure provides a trigger force adjustment mechanism, including: an adjustment component, including a moment arm adjustment disc, a guide seat, and a plurality of sliding members, where the moment arm adjustment disc is configured to support a three-dimensional vehicle emblem, a plurality of groove structures are defined in a bottom of the moment arm adjustment disc and are arranged at intervals in a circumferential direction around a central axis of the moment arm adjustment disc, the guide seat is assembled to the

bottom of the moment arm adjustment disc and is configured for assembling the plurality of sliding members, and a top of each of the sliding members protrudes upward relative to the guide seat and is in limiting engagement with a corresponding one of the groove structures; and a position holding component, assembled to a bottom of the guide seat and the sliding members, and connected to a clutch mechanism, wherein the trigger force adjustment mechanism is configured to adjust a trigger force for unlocking the clutch mechanism.

[0007] Optionally, the moment arm adjustment disc includes a base and a support portion movably connected to the base, the support portion supports the three-dimensional vehicle emblem, and one or more installation positions are provided on a peripheral side of the support portion and are configured for detachable mounting of an operating member, and the plurality of groove structures are defined in a side of the base facing the guide seat; wherein when the operating member is mounted at one of the one or more installation positions, the operating member located on the support portion is rotated to drive the base to rotate around the central axis of the moment arm adjustment disc, so that the plurality of sliding members are retracted from an edge of the base toward the central axis of the moment arm adjustment disc within the guide seat, to adjust a contact area between the plurality of sliding members and the position holding component, thereby adjusting the trigger force for unlocking the clutch mechanism.

[0008] Optionally, the base is in a shape of a disc, each of the plurality of groove structures is an arc-shaped groove, and extends from the edge of the base toward the central axis of the moment arm adjustment disc, and corresponding points at a same position on the plurality of groove structures are located on a same circumference relative to the central axis of the moment arm adjustment disc.

[0009] Optionally, the guide seat includes guide recesses penetrating through the guide seat vertically; each of the sliding members includes a sliding portion and a limiting portion protruding from a top of the sliding portion, and the sliding portion is located within a corresponding one of the guide recesses, the limiting portion extends from the corresponding one of the guide recesses to outside of the guide seat, and the limiting portion is in limiting engagement with a corresponding one of the groove structures in a direction of the central axis of the moment arm adjustment disc, and abuts against an edge of the corresponding one of the groove structures in the circumferential direction around the central axis of the moment arm adjustment disc.

[0010] Optionally, each of the guide recesses includes a first opening and a second opening disposed opposite to each other, the first opening is disposed toward the moment arm

adjustment disc, and the second opening is disposed toward the position holding component, and the limiting portion is snap-fitted into a corresponding first opening, and the top of the sliding portion abuts against a top wall of a corresponding one of the guide recesses.

[0011] Optionally, the position holding component includes a position holding seat, the position holding seat is assembled to the bottom of the guide seat, and snap-fit grooves are defined in a side of the position holding seat facing the guide seat, and the sliding portion is partially located in a corresponding one of the snap-fit grooves and partially located in a corresponding one of the guide recesses.

[0012] Optionally, the position holding seat includes a transmission member, a support seat, and a flange, the transmission member extends along the direction of the central axis of the moment arm adjustment disc, the support seat and the flange are assembled on a peripheral side of the transmission member, and the support seat is located at a top of the transmission member, and is spaced apart from the flange by a distance in the direction of the central axis of the moment arm adjustment disc.

[0013] Optionally, the position holding component further includes an elastic member, and the elastic member is disposed around the transmission member and is compressed between a bottom of the support seat and a top of the flange.

[0014] Optionally, the snap-fit grooves and the guide recesses are disposed corresponding to each other, and both extend from an edge of the position holding component to the central axis of the moment arm adjustment disc.

[0015] Optionally, the number of the plurality of groove structures is even, and the plurality of groove structures are arranged in pairs.

[0016] Optionally, the plurality of groove structures are arranged in a centrosymmetric manner with respect to the central axis of the moment arm adjustment disc.

[0017] Optionally, the number of the plurality of sliding members is even, and the plurality of sliding members are arranged in pairs.

[0018] Optionally, the plurality of sliding members are arranged in a centrosymmetric manner with respect to the central axis of the moment arm adjustment disc.

[0019] The present disclosure further provides a vehicle emblem lifting assembly, including: a clutch mechanism; and the trigger force adjustment mechanism according to any one of the above embodiments, wherein the trigger force adjustment mechanism is configured to support a three-dimensional vehicle emblem and is assembled to a top of the clutch mechanism.

[0020] The present disclosure further provides a vehicle, including the vehicle emblem lifting assembly as described in the above embodiments.

[0021] In the trigger force adjustment mechanism, the vehicle emblem lifting assembly and the vehicle provided by the embodiments of the present disclosure, the trigger force adjustment mechanism includes the adjustment component and the position holding component. The adjustment component includes a moment arm adjustment disc, a guide seat, and a plurality of sliding members. The moment arm adjustment disc is configured to support the three-dimensional vehicle emblem, a plurality of groove structures are defined in the bottom of the moment arm adjustment disc, the guide seat is assembled to the bottom of the moment arm adjustment disc and is used for assembling the plurality of sliding members, and the top of each sliding member protrudes upward relative to the guide seat and is in limiting engagement with a corresponding one of the groove structures. The position holding component is assembled to the bottom of the guide seat and the sliding members, and is connected to the clutch mechanism. The trigger force adjustment mechanism is configured to adjust a trigger force for unlocking the clutch mechanism. In addition, when an external force is applied to the three-dimensional vehicle emblem, the sliding member deflects along the groove structure within the guide seat, converts the external force into a downward displacement, and transmits the downward displacement to the clutch mechanism to unlock the clutch mechanism. In this way, the functions of position holding, displacement transmission, and trigger force adjustment of the three-dimensional vehicle emblem are achieved, the adaptability of the component to different user requirements and the position holding reliability of the component after long-term use are improved, and different user requirements are met.

BRIEF DESCRIPTION OF DRAWINGS

[0022] FIG. 1 is a schematic structural diagram of a vehicle emblem lifting assembly according to an embodiment of the present disclosure.

[0023] FIG. 2 is a side view of the vehicle emblem lifting assembly shown in FIG. 1.

[0024] FIG. 3 is a schematic structural diagram of a trigger force adjustment mechanism according to an embodiment of the present disclosure.

[0025] FIG. 4 is a partial structural schematic diagram of the trigger force adjustment mechanism shown in FIG. 3.

[0026] FIG. 5 is a partial structural schematic diagram of the trigger force adjustment mechanism shown in FIG. 3.

[0027] FIG. 6 is a partial structural schematic diagram of the trigger force adjustment mechanism shown in FIG. 3.

[0028] FIG. 7 is a partial structural schematic diagram of the trigger force adjustment mechanism shown in FIG. 3.

[0029] FIG. 8 is a partial structural schematic diagram of the trigger force adjustment mechanism shown in FIG. 3.

[0030] FIG. 9 is a partial structural schematic diagram of the trigger force adjustment mechanism shown in FIG. 3.

[0031] FIG. 10 is a partial structural schematic diagram of the trigger force adjustment mechanism shown in FIG. 3.

[0032] FIG. 11 is a partial structural schematic diagram of the trigger force adjustment mechanism shown in FIG. 3.

[0033] FIG. 12 is a schematic structural diagram of a vehicle according to an embodiment of the present disclosure.

[0034] Description of reference signs:

[0035] vehicle 200; vehicle emblem lifting assembly 100; vehicle emblem 10; three-dimensional vehicle emblem 11; flat vehicle emblem 12; driving mechanism 20; clutch mechanism 30; link mechanism 40; mounting base 50; trigger force adjustment mechanism 60; adjustment component 601; position holding component 602; moment arm adjustment disc 603; guide seat 604; sliding member 605; groove structure 606; base 607; support portion 608; installation position 609; operating member 610; guide recess 611; first opening 611a; second opening 611b; sliding portion 612; limiting portion 613; position holding seat 614; snap-fit groove 615; transmission member 616; support seat 617; flange 618; elastic member 619; cover plate 70; fastener 71; rapid retraction assist spring 80; central axis A of the moment arm adjustment disc.

DETAILED DESCRIPTION

[0036] Illustrative embodiments, examples of which are illustrated in the accompanying drawings, will be described in detail herein. In the following description with respect to the drawings, like reference numerals in different drawings indicate the same or similar elements, unless otherwise indicated. The implementations described in the following illustrative embodiments do not represent all implementations consistent with the present disclosure. Rather, they are merely examples of apparatuses and methods consistent with some aspects of the present disclosure as detailed in the appended claims.

[0037] The term used in the present disclosure is for the purpose of describing particular embodiments only and is not intended to be limiting of the present disclosure. Technical terms or scientific terms used in the present disclosure should have general meanings as understood by one of ordinary skill in the art to which the present disclosure belongs, unless otherwise defined. Terms, such as “first”, “second”, or the like, used in the specification and claims of the present disclosure do not indicate any order, quantity, or importance, but are merely used to distinguish between different components. Similarly, terms, such as “one”, “a/an”, or the like, do not indicate a quantity limitation, but indicate that there is at least one. The terms “a plurality of/multiple” and “several” refer to two or more. Unless otherwise indicated, terms, such as “front”, “rear”, “lower”, “upper”, “top”, “bottom”, and/or the like, are merely for ease of description, and are not limited to one position or one spatial orientation. Terms, such as “include”, “comprise”, or the like, mean that the elements or objects listed before “include” or “comprise” cover the elements or objects and equivalents thereof listed after “include” or “comprise”, without excluding other elements or objects. Terms, such as “connect”, “connect with each other”, or the like, are not limited to physical or mechanical connections, and may include electrical connections, whether direct or indirect.

[0038] As used in this specification and the appended claims, the singular forms, such as “a/an”, “said” and “the”, are also intended to include the plural forms, unless clearly indicated otherwise in the context. It should also be understood that the term “and/or” as used herein refers to and includes any or all possible combinations of one or more associated listed items.

[0039] The present disclosure provides a trigger force adjustment mechanism, a vehicle emblem lifting assembly, and a vehicle. The trigger force adjustment mechanism includes an adjustment component and a position holding component. The adjustment component includes a moment arm adjustment disc, a guide seat, and a plurality of sliding members. The moment arm adjustment disc is configured to support the three-dimensional vehicle emblem, and a plurality of groove structures are defined in a bottom of the moment arm adjustment disc and are arranged at intervals in a circumferential direction around a central axis of the moment arm adjustment disc. The guide seat is assembled to the bottom of the moment arm adjustment disc and is configured for assembling the plurality of sliding members, and a top of each sliding member protrudes upward relative to the guide seat and is in limiting engagement with a corresponding one of the groove structures. The position holding component is assembled to the bottom of the guide seat and the sliding members, and is

connected to a clutch mechanism. The trigger force adjustment mechanism is configured to adjust a trigger force for unlocking the clutch mechanism.

[0040] In a trigger force adjustment mechanism, a vehicle emblem lifting assembly and a vehicle provided by the embodiments of the present disclosure, the trigger force adjustment mechanism is provided with an adjustment component and a position holding component. The adjustment component is provided with a moment arm adjustment disc, a guide seat and a plurality of sliding members. The moment arm adjustment disc is used for supporting the three-dimensional vehicle emblem, and a bottom of the moment arm adjustment disc is provided with a plurality of groove structures. The guide seat is assembled to the bottom of the moment arm adjustment disc and is used for assembling the plurality of sliding members, and a top of each sliding member extends upward relative to the guide seat and is in limiting engagement with the corresponding groove structure. The position holding component is assembled to the bottom of the guide seat and the sliding members, and is connected to a clutch mechanism. The trigger force adjustment mechanism is configured to adjust a trigger force for unlocking the clutch mechanism. In addition, when an external force is applied to the three-dimensional vehicle emblem, the sliding members deflect along the groove structures in the guide seat, convert the external force into a downward displacement, and transmit the displacement to the clutch mechanism to unlock the clutch mechanism. In this way, the functions of position holding, displacement transmission, and trigger force adjustment of the three-dimensional vehicle emblem can be realized, the adaptability of the components to different user requirements and the position holding reliability of the components after long-term use are improved, and different user requirements are met.

[0041] The trigger force adjustment mechanism, the vehicle emblem lifting assembly, and the vehicle in the present disclosure are described in detail below with reference to the accompanying drawings. The features in the following embodiments and implementations may be combined with each other without conflict.

[0042] FIG. 1 is a schematic structural diagram of a vehicle emblem lifting assembly 100 according to an embodiment of the present disclosure. FIG. 2 is a side view of the vehicle emblem lifting assembly 100 shown in FIG. 1. With reference to FIG. 1 and FIG. 2, the vehicle emblem lifting assembly 100 may be applied to a vehicle 200 (as shown in FIG. 12) to realize lifting of a vehicle emblem 10. The vehicle emblem 10 may be a three-dimensional vehicle emblem 11 or a flat vehicle emblem 12. As shown in FIG. 1 and FIG. 2, the vehicle emblem lifting assembly 100 includes a driving mechanism 20, a clutch mechanism 30, and a link mechanism 40. The driving mechanism 20 is disposed on a body of the vehicle 200. The

clutch mechanism 30 selectively connects the driving mechanism 20 and the three-dimensional vehicle emblem 11. When the clutch mechanism 30 connects the driving mechanism 20 and the three-dimensional vehicle emblem 11, the driving mechanism 20 can drive the three-dimensional vehicle emblem 11 to move relative to the body of the vehicle 200 and support the three-dimensional vehicle emblem 11 through the clutch mechanism 30; when the clutch mechanism 30 disconnects the driving mechanism 20 from the three-dimensional vehicle emblem 11, the three-dimensional vehicle emblem 11 can descend under its own gravity. The clutch mechanism 30 is assembled below the three-dimensional vehicle emblem 11 and selectively connected to the driving mechanism 20. Under a specific condition, the connection and disconnection between the clutch mechanism 30 and the driving mechanism 20 can be realized. When the clutch mechanism 30 is connected to the driving mechanism 20, the driving mechanism 20 drives the clutch mechanism 30, thereby driving the three-dimensional vehicle emblem 11 to move up and down relative to the vehicle body. When the clutch mechanism 30 is separated from the driving mechanism 20, the clutch mechanism 30 and the three-dimensional vehicle emblem 11 descend under their own gravity and are located inside the vehicle body. The link mechanism 40 is assembled below the flat vehicle emblem 12, located on a side of the clutch mechanism 30, and abuts against the clutch mechanism 30. When the clutch mechanism 30 is separated from the driving mechanism 20, the descending clutch mechanism 30 guides the link mechanism 40 to drive the flat vehicle emblem 12 to move upward relative to the vehicle body, so that the flat vehicle emblem 12 is located above the three-dimensional vehicle emblem 11 without protruding beyond a top surface of the vehicle body.

[0043] In the above solution, the vehicle emblem lifting assembly 100 includes the driving mechanism 20, the clutch mechanism 30, and the link mechanism 40. The three-dimensional vehicle emblem 11 is assembled by the clutch mechanism 30, and the flat vehicle emblem 12 is assembled by the link mechanism 40. The clutch mechanism 30 is disposed below the three-dimensional vehicle emblem 11 and selectively connected to the driving mechanism 20. When the clutch mechanism 30 is connected to the driving mechanism 20, the driving mechanism 20 drives the clutch mechanism 30 to drive the three-dimensional vehicle emblem 11 to move up and down relative to the vehicle body. When the clutch mechanism 30 is separated from the driving mechanism 20, the clutch mechanism 30 and the three-dimensional vehicle emblem 11 descend under their own gravity and are located inside the vehicle body, while the descending clutch mechanism 30 guides the link mechanism 40 to drive the flat vehicle emblem 12 to move upward relative to the vehicle body, so that the flat

vehicle emblem 12 is located above the three-dimensional vehicle emblem 11 without protruding beyond the top surface of the vehicle body. Thus, in a normal state, the clutch mechanism 30 connects the three-dimensional vehicle emblem 11 and the driving mechanism 20, and the vehicle emblem lifting assembly 100 can control the three-dimensional vehicle emblem 11 to ascend and maintain a fixed position through the driving mechanism 20. When the three-dimensional vehicle emblem 11 needs to descend normally, the driving mechanism 20 can also drive the three-dimensional vehicle emblem 11 to retract into the vehicle body through the clutch mechanism 30. When the three-dimensional vehicle emblem 11 is struck by a pedestrian or moved by an external force, the clutch mechanism 30 can directly disconnect the three-dimensional vehicle emblem 11 from the driving mechanism 20, allowing the three-dimensional vehicle emblem 11 to descend quickly under its own gravity, which is faster than the descending manner driven by the driving mechanism 20, thereby effectively protecting the three-dimensional vehicle emblem 11. Moreover, after the three-dimensional vehicle emblem 11 descends, the flat vehicle emblem 12 is driven by the link mechanism 40 to be located above the three-dimensional vehicle emblem 11, and in this case, the flat vehicle emblem 12 is used for display, without affecting the recognizability of the three-dimensional vehicle emblem. The three-dimensional vehicle emblem 11 is protected by the flat vehicle emblem 12, and the flat vehicle emblem 12 can also be used to cover an opening of the vehicle body through which the three-dimensional vehicle emblem 11 passes, thereby enhancing the aesthetic appeal of the surface of the vehicle body and improving the user experience.

[0044] In this embodiment, a clutch mechanism 30 is disposed between the driving mechanism 20 and the three-dimensional vehicle emblem 11, and the clutch mechanism 30 can selectively connect or disconnect them. Thus, in a normal state, the clutch mechanism 30 may connect the driving mechanism 20 and the three-dimensional vehicle emblem 11 together, and in this case, the driving mechanism 20 may drive the three-dimensional vehicle emblem 11 to slowly ascend and descend relative to the vehicle body of the vehicle 200, thereby ensuring normal use of the three-dimensional vehicle emblem 11. When the three-dimensional vehicle emblem 11 is struck, moved, or stolen by a pedestrian, the clutch mechanism 30 may disconnect the driving mechanism 20 from the three-dimensional vehicle emblem 11, so that the three-dimensional vehicle emblem 11 loses the support of the driving mechanism 20, and descends quickly into the interior of the vehicle body under its own gravity, thereby preventing damage or theft.

[0045] In the embodiment shown in FIG. 1 and FIG. 2, the vehicle emblem lifting assembly 100 further includes a mounting base 50, the three-dimensional vehicle emblem 11 is mounted on the mounting base 50, and the clutch mechanism 30 is at least partially arranged on the mounting base 50. In this way, the mounting base 50 can support and protect the three-dimensional vehicle emblem 11 and at least part of the clutch mechanism 30, so that the three-dimensional vehicle emblem 11 can ascend or descend together with the mounting base 50. Meanwhile, when the clutch mechanism 30 disconnects the driving mechanism 20 from the three-dimensional vehicle emblem 11, the three-dimensional vehicle emblem 11 and at least part of the clutch mechanism 30 can quickly retract together with the mounting base 50, ensuring the stability of the vehicle emblem lifting assembly 100.

[0046] Specifically, the mounting base 50 may be movably disposed on the body of the vehicle 200, and the mounting base 50 may be configured to carry the three-dimensional vehicle emblem 11 when the three-dimensional vehicle emblem 11 ascends and descends. The driving mechanism 20 may be connected to the clutch mechanism 30, and at least part of the clutch mechanism 30 is directly disposed on the mounting base 50, so that when the driving mechanism 20 drives the clutch mechanism 30 to move, the entire mounting base 50 and the three-dimensional vehicle emblem 11 on the mounting base 50 can be driven to move together, thereby ensuring the stability of the vehicle emblem lifting assembly 100.

[0047] To meet the trigger force requirements of different users, the vehicle emblem lifting assembly 100 of the present disclosure further includes a trigger force adjustment mechanism 60. The trigger force adjustment mechanism 60 is assembled at the top of the clutch mechanism 30 and located at the bottom of the three-dimensional vehicle emblem 11. The trigger force adjustment mechanism 60 can adjust the trigger force for unlocking the clutch mechanism 30. By providing the trigger force adjustment mechanism 60, the magnitude of the external-force-induced trigger force for downward movement of the three-dimensional vehicle emblem can be adjusted according to the actual needs of the user and the attenuation degree of the components (e.g., the components of the clutch mechanism 30), thereby preventing false triggering, extending the service life of the components, and meeting the needs of the user.

[0048] FIG. 3 is a schematic structural diagram of a trigger force adjustment mechanism 60 according to an embodiment of the present disclosure. FIG. 4 is a partial schematic structural diagram of the trigger force adjustment mechanism 60 shown in FIG. 3. FIG. 5 is a partial schematic structural diagram of the trigger force adjustment mechanism 60 shown in FIG. 3. FIG. 6 is a partial schematic structural diagram of the trigger force adjustment mechanism 60

shown in FIG. 3. FIG. 7 is a partial schematic structural diagram of the trigger force adjustment mechanism 60 shown in FIG. 3. FIG. 8 is a partial schematic structural diagram of the trigger force adjustment mechanism 60 shown in FIG. 3. FIG. 9 is a partial schematic structural diagram of the trigger force adjustment mechanism 60 shown in FIG. 3. FIG. 10 is a partial schematic structural diagram of the trigger force adjustment mechanism 60 shown in FIG. 3. FIG. 11 is a partial schematic structural diagram of the trigger force adjustment mechanism 60 shown in FIG. 3. As shown in FIG. 1 to FIG. 11, the trigger force adjustment mechanism 60 is assembled to the mounting base 50, and the mounting base 50 serves to support and fix the trigger force adjustment mechanism 60. The trigger force adjustment mechanism 60 is configured to support the three-dimensional vehicle emblem 11 and is assembled on the top of the clutch mechanism 30, and the trigger force adjustment mechanism 60 is configured to adjust a trigger force for unlocking the clutch mechanism 30. When the three-dimensional vehicle emblem 11 needs to quickly retract under the influence of the external force, the trigger force adjustment mechanism 60 transmits the displacement to the clutch mechanism 30 to unlock the clutch mechanism 30 and the driving mechanism 20, realizing the rapid retraction of the three-dimensional vehicle emblem 11. The trigger force adjustment mechanism 60 serves as an intermediate component to transmit the displacement of the three-dimensional vehicle emblem 11 upon collision to the clutch mechanism 30. When the three-dimensional vehicle emblem 11 is struck or pried by someone, the three-dimensional vehicle emblem 11 needs to descend quickly to a safe position. Therefore, the support structure of the three-dimensional vehicle emblem 11 is required to not only hold the three-dimensional vehicle emblem 11 in place, but also generate a downward displacement when an external force is applied to the three-dimensional vehicle emblem 11. The trigger force is converted into a downward displacement through moment arm conversion, and the clutch mechanism 30 undergoes rapid retraction. The trigger force adjustment mechanism 60 can realize the functions of position holding, displacement transmission, and trigger force adjustment of the three-dimensional vehicle emblem 11.

[0049] In the embodiments shown in FIG. 3 to FIG. 11, the trigger force adjustment mechanism 60 includes an adjustment component 601 and a position holding component 602. The adjustment component 601 includes a moment arm adjustment disc 603, a guide seat 604, and a plurality of sliding members 605. The moment arm adjustment disc 603 is configured to support the three-dimensional vehicle emblem 11. The top of the moment arm adjustment disc 603 is used to assemble the three-dimensional vehicle emblem 11. The bottom of the moment arm adjustment disc 603 is provided with a plurality of groove structures 606

distributed at intervals in the circumferential direction around a central axis A of the moment arm adjustment disc 603. The guide seat 604 is assembled to the bottom of the moment arm adjustment disc 603, and is used to assemble a plurality of sliding members 605, and the top of each sliding member 605 protrudes upward relative to the guide seat 604 and is in limiting engagement with the corresponding groove structure 606. The position holding component 602 is assembled to the bottom of the guide seat 604 and the sliding members 605, and is connected to the clutch mechanism 30. The trigger force adjustment mechanism 60 is configured to adjust a trigger force for unlocking the clutch mechanism 30. In addition, when an external force is applied to the three-dimensional vehicle emblem 11, the sliding members 605 deflect along the groove structures 606 in the guide seat 604, converting the external force into a downward displacement, and transmitting the downward displacement to the clutch mechanism 30 to unlock the clutch mechanism 30.

[0050] In this embodiment, the central axis A of the moment arm adjustment disc 603 may be in a vertical direction. The top of the sliding member 605 is arranged to protrude out of the guide seat 604 and is in limiting engagement with the groove structure 606 in a vertical direction, and in a horizontal direction, the protruding part of the top of the sliding member 605 abuts against the groove structure 606. When an external force is applied to the three-dimensional vehicle emblem 11, the sliding members 605 deflect along the groove structures 606 in the guide seat 604, converting the external force into the downward displacement, and transmitting the downward displacement to the clutch mechanism 30. When the external force reaches a certain value, the clutch mechanism 30 is unlocked. In this way, the functions of position holding, displacement transmission, and trigger force adjustment of the three-dimensional vehicle emblem 11 can be realized, the adaptability of the components to different user requirements and the position holding reliability of the components after long-term use are improved, and different user requirements are met.

[0051] In the embodiments shown in FIG. 3 to FIG. 11, the adjustment component 601 is rotatable by operation and is switchable between different mounting positions. The position holding component 602 is configured to ensure that the clutch mechanism 30 remains connected to the driving mechanism 20 to support the three-dimensional vehicle emblem 11 when there is no external impact or force on the three-dimensional vehicle emblem 11. The moment arm adjustment disc 603 includes a base 607 and a support portion 608 movably connected to the base 607, and the support portion 608 supports the three-dimensional vehicle emblem 11. The peripheral side of the support portion 608 is provided with at least one installation position 609 (one installation position 609 is shown in the figure). The installation

position 609 is used for detachable mounting of an operating member 610. In this embodiment, the operating member 610 is detachably assembled on the side wall of the support portion 608 of the moment arm adjustment disc 603, and the operating member 610 can be rotated to different installation positions. The operating member 610 may be a locking screw, and the locking screw may be fastened to a fixing shaft of the three-dimensional vehicle emblem 11. When the moment arm adjustment disc 603 needs to be adjusted, the locking screw is loosened for rotation operation, and the locking screw can lock the moment arm adjustment disc 603 in a specified position after adjustment. The plurality of groove structures 606 are defined on a side of the base 607 facing the guide seat 604. When the operating member 610 is installed at one of the installation positions 609, the operating member 610 located on the support portion 608 is rotated to drive the base 607 to rotate around the central axis A of the moment arm adjustment disc 603, causing the plurality of sliding members 605 to retract within the guide seat 604 from the edge of the base 607 toward the central axis A of the moment arm adjustment disc 603, thereby adjusting the contact area between the plurality of sliding members 605 and the position holding component 602, so as to adjust the trigger force for unlocking the clutch mechanism 30. In this embodiment, the base 607 has a disc structure, and the plurality of groove structures 606 are arranged at intervals along a circumferential direction of the disc structure. The plurality of groove structures 606 are recessed toward the support portion 608 from bottom to top in the vertical direction, and the base 607 is effectively used to limit the protruding parts of the sliding members 605, so that the entire trigger force adjustment mechanism 60 has a compact structure and a small size in the vertical direction. After the operating member 610 is switched from a first installation position to a second installation position, the plurality of groove structures 606 are driven to rotate around the central axis A of the moment arm adjustment disc 603, causing the plurality of sliding members 605 to retract within the guide seat 604 towards the central axis A of the moment arm adjustment disc 603, thereby increasing the contact area between the plurality of sliding members 605 and the position holding component 602, and thus increasing the trigger force for unlocking the clutch mechanism 30.

[0052] In this embodiment, an example in which the operating member 610 is rotated to the first installation position and the second installation position is described. When the operating member 610 is rotated to the first installation position, which is also the initial position, the outer edge of each sliding member 605 protrudes beyond the outer edge of the guide seat 604. That is, each sliding member 605 is at the farthest distance from the central axis A of the

moment arm adjustment disc 603 within the guide seat 604, and the contact area between the sliding member 605 and the position holding component 602 is the smallest. At this position, the trigger force for rapid retraction of the three-dimensional vehicle emblem 11 is relatively small, and the sensitivity of the anti-triggering function of the three-dimensional vehicle emblem 11 is relatively high, which is safe and reliable. After long-term use, the trigger force for the component of the clutch mechanism 30 is attenuated. Therefore, in this embodiment, the position of the operating member 610 is adjusted. For example, the operating member 610 is rotated from the first installation position to the second installation position. At this time, the outer edge of each sliding member 605 is retracted relative to the outer edge of the guide seat 604 toward the central axis A of the moment arm adjustment disc 603. That is, each sliding member 605 is slightly closer to the central axis A of the moment arm adjustment disc 603 within the guide seat 604. The two sliding members 605 arranged opposite to each other both slide toward the central axis A of the moment arm adjustment disc 603, and the distance between the two sliding members 605 arranged opposite to each other is reduced, so that the contact area between the plurality of sliding members 605 and the position holding component 602 is increased, which can increase the trigger force for unlocking the clutch mechanism 30, and increase the trigger force for the component of the clutch mechanism 30, thereby meeting the user's requirements for different trigger forces and addressing the issue of attenuation of the trigger force for actuating the clutch mechanism 30. In this embodiment, the rotation direction for switching from the first installation position to the second installation position may be a clockwise direction, and the rotation direction is adapted to the guiding direction of the groove structure 606.

[0053] The above trigger force adjustment mechanism 60 can transmit the displacement amount generated when the three-dimensional vehicle emblem 11 is struck to the clutch mechanism 30, and the trigger force adjustment mechanism 60 can realize the functions of position holding, displacement transmission, and trigger force adjustment of the three-dimensional vehicle emblem 11. By switching the operating member 610 from the first installation position to the second installation position, the magnitude of the trigger force for the downward rapid retraction of the three-dimensional vehicle emblem 11 can be adjusted to meet the trigger force requirements of different users, and the attenuated position holding force of the component after long-term use is strengthened, thereby extending the service life of the component, improving the adaptability of the component to different user requirements and the position holding reliability of the component after long-term use, and meeting different user requirements.

[0054] In the embodiments shown in FIG. 3 to FIG. 11, the base 607 is in the shape of a disc, the groove structure 606 is an arc-shaped groove, and the groove structure 606 extends from an edge of the base 607 toward the central axis A of the moment arm adjustment disc 603. Moreover, corresponding points at the same position on the plurality of groove structures 606 are located on the same circumference relative to the central axis A of the moment arm adjustment disc 603. The moment arm adjustment disc 603 is provided with a groove structure 606 with a variable radius, and when the operating member 610 is operated, the moment arm adjustment disc 603 can adjust the contact area between the sliding member 605 and the position holding component 602, thereby changing the magnitude of the moment arm and changing the trigger force value for the rapid retraction of the three-dimensional vehicle emblem 11. With this arrangement, when the operating member 610 is rotated from the first installation position to the second installation position, the plurality of sliding members 605 can synchronously rotate and retract toward the central axis A of the moment arm adjustment disc 603 to increase the contact area between the plurality of sliding members 605 and the position holding component 602, thereby increasing the trigger force for unlocking the clutch mechanism 30. In this way, the trigger force for the downward rapid retraction of the three-dimensional vehicle emblem 11 is increased. In this embodiment, the number of the plurality of groove structures 606 is even, and the plurality of groove structures 606 are arranged in pairs. With this arrangement, the guiding effect of the plurality of groove structures 606 can be uniform, the force can be uniform during adjustment, and the adjustment requires less effort. The plurality of groove structures 606 are arranged in a centrosymmetric manner with respect to the central axis A of the moment arm adjustment disc 603. With this arrangement, the guiding directions of the plurality of groove structures 606 are kept in the same direction, which is stable and reliable.

[0055] Referring back to the embodiments shown in FIG. 1 to FIG. 3, the vehicle emblem lifting assembly 100 further includes a cover plate 70, and the cover plate 70 is fixed to the mounting base 50 through a plurality of fasteners 71. The plurality of fasteners 71 are located on the peripheral side of the trigger force adjustment mechanism 60 and are connected to the cover plate 70 and the mounting base 50, accommodating the trigger force adjustment mechanism 60 internally, thereby improving the aesthetic appearance. Moreover, the installation opening for the operating member 610 (i.e., the adjustment opening for adjusting the moment arm adjustment disc 603 to adjust the trigger force for unlocking the clutch mechanism 30) is exposed, allowing the moment arm to be adjusted without disassembling the peripheral member, which is convenient in operation. The three-dimensional vehicle

emblem 11 is connected to the trigger force adjustment mechanism 60 and is located above the cover plate 70. The cover plate 70 is obliquely disposed to adapt to the top surfaces of bodies of different vehicles 200, improving the aesthetic appearance. In this embodiment, the support portion 608 has a column structure with the central axis A extending in the vertical direction, and the operating member 610 is disposed on the peripheral side of the support portion 608 and located between two adjacent fasteners 71, facilitating operation.

[0056] In the embodiments shown in FIG. 1 to FIG. 11, the guide seat 604 includes a guide recess 611 penetrating vertically through it. The sliding member 605 includes a sliding portion 612 and a limiting portion 613 protruding from the top of the sliding portion 612. The sliding portion 612 is located in the guide recess 611, and the limiting portion 613 extends from the guide recess 611 to the outside of the guide seat 604. The limiting portion 613 is in limiting engagement with the groove structure 606 in the direction of the central axis A of the moment arm adjustment disc 603, and abuts against the edge of the groove structure 606 in the circumferential direction around the central axis A of the moment arm adjustment disc 603. In this embodiment, the position holding component 602 serves to fix the sliding portion 612. The guide recess 611 extends along an edge of the position holding component 602 toward the central axis A of the moment arm adjustment disc 603. When the operating member 610 is rotated from the first installation position to the second installation position, the sliding portion 612 moves relatively close to the central axis A of the moment arm adjustment disc 603 under the guidance of both the groove structure 606 and the guide recess 611. The movement direction may include two directions: one direction is a curved direction along the groove structure 606, and the other direction is a linear direction along the guide recess 611. Thus, the magnitude of the trigger force for the downward rapid retraction of the three-dimensional vehicle emblem 11 can be adjusted to meet the trigger force requirements of different users.

[0057] In the embodiments shown in FIG. 3 to FIG. 11, the guide recess 611 includes a first opening 611a and a second opening 611b disposed opposite to each other, the first opening 611a is disposed toward the moment arm adjustment disc 603, and the second opening 611 b is disposed toward the position holding component 602. The limiting portion 613 is snap-fitted into the first opening 611a, and the top of the sliding portion 612 abuts against the top wall of the guide recess 611. In this embodiment, an opening width of the first opening 611a is less than that of the second opening 611b, and is at least greater than the outer diameter of the limiting portion 613, so that when the limiting portion 613 slides in the guide recess 611, the first opening 611a provides guidance, which is stable and reliable. In addition,

the top of the sliding portion 612 abuts against the top wall of the guide recess 611, ensuring stability during sliding.

[0058] In the embodiments shown in FIG. 3 to FIG. 11, the position holding component 602 includes a position holding seat 614. The position holding seat 614 is configured to support the adjustment component 601. The position holding seat 614 is assembled to the bottom of the guide seat 604, and snap-fit grooves 615 are provided on a side of the position holding seat 614 facing the guide seat 604. The sliding portion 612 is partially located in the snap-fit groove 615 and partially located in the guide recess 611. The snap-fit groove 615 plays a role of guiding or constraining, making it more labor-saving for the sliding portion 612 to slide in the track of the guide recess 611. In this embodiment, the snap-fit grooves 615 are disposed corresponding to the guide recesses 611. The positions and number of the snap-fit grooves 615 are arranged in one-to-one correspondence with the positions and number of the guide recesses 611. The guide recesses 611 and the snap-fit grooves 615 extend along an edge of the position holding component 602 toward the central axis A of the moment arm adjustment disc 603. The guide recesses 611 and the snap-fit grooves 615 extend along the edge of the base 607 toward the central axis A of the moment arm adjustment disc 603. The number of the plurality of sliding members 605 is even, and the plurality of sliding members 605 are disposed in pairs. The plurality of sliding members 605 are arranged in a centrosymmetric manner with respect to the central axis A of the moment arm adjustment disc 603. With this arrangement, it is stable and reliable when the limiting portion 613 slides in the guide recess 611.

[0059] In the embodiments shown in FIG. 3 to FIG. 11, the position holding seat 614 includes a transmission member 616, a support seat 617, and a flange 618. The transmission member 616 extends in the direction of the central axis A of the moment arm adjustment disc 603. The transmission member 616 extends in the vertical direction. The support seat 617 and the flange 618 are assembled on the peripheral side of the transmission member 616. The support seat 617 is located at the top of the transmission member 616, and is spaced apart from the flange 618 by a distance in the direction of the central axis A of the moment arm adjustment disc 603. The distance is adapted to the downward displacement amount of the three-dimensional vehicle emblem 11. The position holding component 602 further includes an elastic member 619, and the elastic member 619 is disposed around the transmission member 616 and is compressed between the bottom of the support seat 617 and the top of the flange 618. The elastic member 619 may be a spring. By providing the flexible position holding structure supported by the spring, the spring supports the weight of the support seat

617 and the adjustment component 601, so that the three-dimensional vehicle emblem 11 is maintained at the working position. The adjustment component 601 overlaps the position holding component 602. When an external force is applied to the three-dimensional vehicle emblem 11, the external force breaks the balance, the adjustment component 601 undergoes position deflection, and the edge of the sliding member 605 is in contact with the support seat 617 during deflection. By adjusting the contact between the edge of the sliding member 605 and the support seat 617, the magnitude of the trigger force is adjusted to change the force value for triggering the rapid retraction of the three-dimensional vehicle emblem 11. In the above process, the support seat 617 can convert the external force into a displacement amount and transmit the displacement amount to the clutch mechanism 30, the clutch mechanism 30 performs unlocking to separate the three-dimensional vehicle emblem 11 from the driving mechanism 20, and the three-dimensional vehicle emblem 11 can descend quickly under the influence of its own gravity and the rapid retraction assist spring 80, thereby achieving the rapid retraction function. In this embodiment, the limiting portion 613 of the sliding member 605 can slide in the groove structure 606, and the contact radius between the sliding portion 612 of the sliding member 605 and the position holding seat 614 is changed by the moment arm adjustment disc 603, thereby adjusting the force value for triggering the rapid retraction of the three-dimensional vehicle emblem 11. A spring is applied in the position holding component 602 for support purposes, the spring providing a flexible connection while providing a position holding function. When an external force is applied to the three-dimensional vehicle emblem 11, the spring force balance is broken, and the displacement of the position holding component 602 occurs. This displacement is transmitted to the clutch mechanism 30 through the transmission member 616. This structure is simple, and realizes the functions of position holding and deflection displacement.

[0060] FIG. 12 is a schematic diagram of a vehicle according to an embodiment of the present disclosure. As shown in FIG. 12, a vehicle 200 includes a vehicle body. The vehicle emblem lifting assembly is disposed on the vehicle body. The vehicle emblem lifting assembly 100 shown in the embodiments of FIG. 1 and FIG. 2 may also be disposed on the vehicle body. By providing the vehicle emblem lifting assembly 100 shown in the embodiments of FIG. 1 and FIG. 2, the three-dimensional vehicle emblem 11 can be actively lowered while guiding the flat vehicle emblem 12 to rise, resulting in a better user experience. Alternatively, when the three-dimensional vehicle emblem 11 is impacted, the flat vehicle emblem 12 may rise, thereby displaying the vehicle 200 via the flat vehicle emblem 12. The three-dimensional vehicle emblem 11 has high recognizability and an aesthetically pleasing

exterior, improving user experience. In this embodiment, the vehicle 200 includes the vehicle emblem lifting assembly 100 having the trigger force adjustment mechanism 60 shown in the embodiments of FIG. 3 to FIG. 11, the magnitude of the external-force-induced trigger force for the downward movement of the three-dimensional vehicle emblem 11 can be adjusted according to the actual user needs and the attenuation degree of the components, thereby preventing false triggering, extending the service life of the components, and meeting the user needs.

[0061] The foregoing descriptions are merely some embodiments of the present disclosure, and are not intended to limit the present disclosure. Any modifications, equivalent replacements, improvements, or the like, made without departing from the spirit and principle of the present disclosure shall fall within the protection scope of the present disclosure.

CLAIMS

1. A trigger force adjustment mechanism (60), comprising:

an adjustment component (601), comprising a moment arm adjustment disc (603), a guide seat (604), and a plurality of sliding members (605), wherein the moment arm adjustment disc (603) is configured to support a three-dimensional vehicle emblem (11), a plurality of groove structures (606) are defined in a bottom of the moment arm adjustment disc (603) and are arranged at intervals in a circumferential direction around a central axis (A) of the moment arm adjustment disc (603), the guide seat (604) is assembled to the bottom of the moment arm adjustment disc (603) and is configured for assembling the plurality of sliding members (605), and a top of each of the sliding members (605) protrudes upward relative to the guide seat (604) and is in limiting engagement with a corresponding one of the groove structures (606); and

a position holding component (602), assembled to a bottom of the guide seat (604) and the sliding members (605), and connected to a clutch mechanism (30),

wherein the trigger force adjustment mechanism (60) is configured to adjust a trigger force for unlocking the clutch mechanism (30).

2. The trigger force adjustment mechanism (60) according to claim 1, wherein

the moment arm adjustment disc (603) comprises a base (607) and a support portion (608) movably connected to the base (607),

the support portion (608) supports the three-dimensional vehicle emblem (11), and one or more installation positions (609) are provided on a peripheral side of the support portion (608) and are configured for detachable mounting of an operating member (610), and

the plurality of groove structures (606) are defined on a side of the base (607) facing the guide seat (604); and

wherein when the operating member (610) is mounted at one of the one or more installation positions (609), the operating member (610) located on the support portion (608) is rotated to drive the base (607) to rotate around the central axis (A) of the moment arm adjustment disc (603), so that the plurality of sliding members (605) are retracted from an edge of the base (607) toward the central axis (A) of the moment arm adjustment disc (603) within the guide seat (604), to adjust a contact area between the plurality of sliding members (605) and the position holding component (602), thereby adjusting the trigger force for unlocking the clutch mechanism (30).

3. The trigger force adjustment mechanism (60) according to claim 2, wherein the base (607) is in a shape of a disc, each of the plurality of groove structures (606) is an arc-shaped

groove, and extends from the edge of the base (607) toward the central axis (A) of the moment arm adjustment disc (603), and corresponding points at a same position on the plurality of groove structures (606) are located on a same circumference relative to the central axis (A) of the moment arm adjustment disc (603).

4. The trigger force adjustment mechanism (60) according to any one of claims 1 to 3, wherein

the guide seat (604) includes guide recesses (611) penetrating through the guide seat (604) vertically,

each of the sliding members (605) includes a sliding portion (612) and a limiting portion (613) protruding from a top of the sliding portion (612), and

the sliding portion (612) is located within a corresponding one of the guide recesses (611), the limiting portion (613) extends from the corresponding one of the guide recesses (611) to outside of the guide seat (604), and the limiting portion (613) is in limiting engagement with a corresponding one of the groove structures (606) in a direction of the central axis (A) of the moment arm adjustment disc (603), and abuts against an edge of the corresponding one of the groove structures (606) in the circumferential direction around the central axis (A) of the moment arm adjustment disc (603).

5. The trigger force adjustment mechanism (60) according to claim 4, wherein

each of the guide recesses (611) comprises a first opening (611a) and a second opening (611b) disposed opposite to each other,

the first opening (611a) is disposed toward the moment arm adjustment disc (603), and the second opening (611b) is disposed toward the position holding component (602), and

the limiting portion (613) is snap-fitted into a corresponding first opening (611a), and the top of the sliding portion (612) abuts against a top wall of a corresponding one of the guide recesses (611).

6. The trigger force adjustment mechanism (60) according to claim 4 or 5, wherein

the position holding component (602) comprises a position holding seat (614),

the position holding seat (614) is assembled to the bottom of the guide seat (604), and snap-fit grooves (615) are provided on a side of the position holding seat (614) facing the guide seat (604), and

the sliding portion (612) is partially located in a corresponding one of the snap-fit grooves (615) and partially located in a corresponding one of the guide recesses (611).

7. The trigger force adjustment mechanism (60) according to claim 6, wherein

the position holding seat (614) comprises a transmission member (616), a support seat

(617), and a flange (618),

the transmission member (616) extends along the direction of the central axis (A) of the moment arm adjustment disc (603),

the support seat (617) and the flange (618) are assembled on a peripheral side of the transmission member (616), and

the support seat (617) is located at a top of the transmission member (616), and is spaced apart from the flange (618) by a distance in the direction of the central axis (A) of the moment arm adjustment disc (603).

8. The trigger force adjustment mechanism (60) according to claim 7, wherein
the position holding component (602) further includes an elastic member (619), and
the elastic member (619) is disposed around the transmission member (616) and is compressed between a bottom of the support seat (617) and a top of the flange (618).

9. The trigger force adjustment mechanism (60) according to any one of claims 6 to 8, wherein

the snap-fit grooves (615) and the guide recesses (611) are disposed corresponding to each other, and both extend from an edge of the position holding component (602) to the central axis (A) of the moment arm adjustment disc (603).

10. The trigger force adjustment mechanism (60) according to any one of claims 1 to 9, wherein

the number of the plurality of groove structures (606) is even, and the plurality of groove structures (606) are arranged in pairs.

11. The trigger force adjustment mechanism (60) according to claim 10, wherein
the plurality of groove structures (606) are arranged in a centrosymmetric manner with respect to the central axis (A) of the moment arm adjustment disc (603).

12. The trigger force adjustment mechanism (60) according to any one of claims 1 to 11, wherein

the number of the plurality of sliding members (605) is even, and the plurality of sliding members (605) are arranged in pairs.

13. The trigger force adjustment mechanism (60) according to claim 12, wherein
the plurality of sliding members (605) are arranged in a centrosymmetric manner with respect to the central axis (A) of the moment arm adjustment disc (603).

14. A vehicle emblem lifting assembly (100), comprising:

a clutch mechanism (30); and

the trigger force adjustment mechanism (60) according to any one of claims 1 to 13,

wherein the trigger force adjustment mechanism (60) is configured to support the three-dimensional vehicle emblem (11) and is assembled to a top of the clutch mechanism (30).

15. A vehicle (200), comprising the vehicle emblem lifting assembly (100) according to claim 14.