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## SHOCK ABSORBING STRUCTURE OF MOBILE PHONE HOLDER

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### Abstract

A shock absorbing structure includes: a housing having an opening, an inner surface and an outer surface; a universal joint unit having a spherical joint, a bushing having a blocking plate and a convex piece, and a screw bolt; a shock absorbing ring sheathing a portion of the convex piece protruding from the housing and elastically abutting between the outer surface and the spherical joint; and a clamping claw disposed on the housing and covering the inner surface and the blocking plate. When the clamping claw is applied with an external force to move the housing toward the universal joint unit, the shock absorbing ring generates an elastic deformation to absorb an impact force.

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### Background/Summary

## BACKGROUND OF THE DISCLOSURE

### Technical Field

[0001] The present disclosure relates to a mobile phone holder, especially to a shock absorbing structure of a mobile phone holder.

### Description of Related Art

[0002] With the electronic technology being rapidly developed, a mobile phone has become one of the necessary electronic devices for consumers. Peripheral products relative to the mobile phone have also been available in the market, wherein a related-art mobile phone holder is commonly used on various occasions. The related-art mobile phone holder clamps a mobile phone by a clawing manner to make the mobile phone be fastened with a fastening seat. Some mobile phone holders are provided with a multi-staged linkage or a universal joint between the mobile phone holder and the fastening seat to adjust the angle and the location of the mobile phone holder, thus various operating environments required by consumers are satisfied.

[0003] However, no matter the mobile phone holder is the fixed type or has the multi-staged linkage or the universal joint, a shock absorbing structure is not provided to the mobile phone holder. When the mobile phone holder or the mobile phone is subjected to an impact, a collision or a shock, the impact force is directly transferred to the fastening seat of the mobile phone holder and the mobile phone holder may be damaged after being used for a period of time, the aforesaid problem mostly happens when the mobile phone holder is installed on a motorcycle or a car.

[0004] Accordingly, the applicant of the present disclosure has devoted himself for improving the mentioned shortages.

## SUMMARY OF THE DISCLOSURE

[0005] The present disclosure is to provide a shock absorbing structure of a mobile phone holder, which has an advantage of preventing an impact force from being directly transferred to a universal joint unit, and protecting the mobile phone holder from being damaged.

[0006] Accordingly, the present disclosure provides a shock absorbing structure of a mobile phone holder, which includes a housing, a universal joint unit, a shock absorbing ring and a clamping claw. The housing has an opening, an inner surface and an outer surface, wherein the opening is in communication with the inner surface and the outer surface. The universal joint unit includes a spherical joint, a bushing and a screw bolt. The bushing includes a blocking plate and a convex piece. The convex piece passes through the opening. The blocking plate abuts against the inner surface. The screw bolt passes through the convex piece and is screwed and fastened with the spherical joint. The shock absorbing ring sheathes a portion of the convex piece which protrudes from the housing, and elastically abuts between the outer surface and the spherical joint. The clamping claw is disposed on the housing and covers the inner surface and the blocking plate. When the clamping claw is applied with an external force to move the housing toward the universal joint unit, the shock absorbing ring generates an elastic deformation to absorb an impact force.

[0007] According to one embodiment of the present disclosure, the shock absorbing ring is substantially formed in a ball shape, the shock absorbing ring has a truncated opening, and the truncated opening abuts against the spherical joint.

[0008] According to one embodiment of the present disclosure, the spherical joint includes a connecting seat and a ball part, the connecting seat has a screw hole allowing the screw bolt to be screwed in and fastened, and the ball part is disposed at one side of the connecting seat away from the screw hole.

[0009] According to one embodiment of the present disclosure, the connecting seat has a step, the step surrounds the screw hole, and the shock absorbing ring elastically abuts against the step.

[0010] According to one embodiment of the present disclosure, the spherical joint has a position limiting recess, and one end of the convex piece away from the blocking plate is disposed in the position limiting recess.

[0011] According to one embodiment of the present disclosure, a shape of the convex piece is corresponding to a shape of the opening.

[0012] According to one embodiment of the present disclosure, the convex piece is a non-circular piece, and the opening is a non-circular slot.

[0013] According to one embodiment of the present disclosure, the universal joint unit has a pad, and the pad sheathes the convex piece and clamped between the inner surface and the blocking plate.

[0014] According to one embodiment of the present disclosure, the clamping claw includes a cover case, a fixed claw and a moveable claw, the cover case correspondingly covers the housing, the fixed claw is fastened at one end of the cover case and the moveable claw is moveably disposed at another end of the cover case.

[0015] According to one embodiment of the present disclosure, the moveable claw moves a distance in a direction away from the fixed claw.

[0016] Advantages achieved by the present disclosure are as follows. According to the shock absorbing structure of the mobile phone holder provided by the present disclosure, the impact force is prevented from being directly transferred to the universal joint unit and the mobile phone holder is protected from being damaged by sheathing the shock absorbing ring at a portion of the convex piece protruding from the housing and elastically abutting between the housing and the spherical joint.

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## Description

### BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The disclosure itself, however, may be best understood by reference to the following detailed description of the disclosure, which describes a number of exemplary embodiments of the disclosure, taken in conjunction with the accompanying drawings, in which:

[0018] FIG. 1 is a perspective view showing the assembly according to the present disclosure;

[0019] FIG. 2 is a perspective exploded view according to the present disclosure;

[0020] FIG. 3 is a partial perspective exploded view according to the present disclosure;

[0021] FIG. 4 is a side cross-sectional view according to the present disclosure; and

[0022] FIG. 5 is a side cross-sectional view showing an operating status according to the present disclosure.

### DETAILED DESCRIPTION

[0023] It is to be understood that the terms for indicating positions and the location relation, for example “front”, “rear”, “left”, “right”, “front end”, “rear end”, “distal end”, “vertical”, “horizontal”, “top end” and “bottom end”, are based on the positions and the location relation disclosed in the drawings, and only used for disclosing the present disclosure and not used for indicating or implying the specified location of the device or the components or the specified structure and operation in certain location, thus the present disclosure is not intended to be limiting.

[0024] The technical contents of this disclosure will become apparent with the detailed description of embodiments accompanied with the illustration of related drawings as follows. It is intended that the embodiments and drawings disclosed herein are to be considered illustrative rather than restrictive.

[0025] The present disclosure provides a shock absorbing structure of a mobile phone holder, which is moveably and pivotally disposed in a mobile phone holder fastening seat B and capable of clamping and fastening a mobile phone A. Please refer from FIG. 1 to FIG. 4, the shock absorbing structure of the mobile phone holder of the present disclosure includes a housing **10**, a universal joint unit **20**, a shock absorbing ring **30** and a clamping claw **40**.

[0026] In some embodiments, the housing **10** is formed as one piece (or integrally formed) by a

plastic injecting molding, here is not intended to be limiting. In some embodiments, the housing **10** is substantially formed in a triangular shape. In other embodiments, the shape of the housing **10** may be formed in any geometrical shape according to different needs, here is not intended to be limiting. The housing **10** has an opening **11**, an inner surface **12** and an outer surface **13**. In some embodiments, the outer surface **13** is defined as an outer side surface of the housing **10** as shown in FIG. **1** or FIG. **3**. The inner surface **12** is defined as an inner side surface of the housing **10** as shown in FIG. **2** or FIG. **4**. The opening **11** is in communication with the inner surface **12** of the housing **10** and the outer surface **13** of the housing **10**.

[0027] The universal joint unit **20** mainly includes a spherical joint **21**, a bushing **22** and a screw bolt **23**. The bushing **22** includes a blocking plate **221** and a convex piece **222** connected to each other. In some embodiments, the blocking plate **221** is connected to one end of the convex piece **222**, and the bushing **22** has a sunk hole **223** penetrating the blocking plate **221** and the convex piece **222**. The bushing **22** passes through the housing **10**. In some embodiments, the convex piece **222** passes through the opening **11** from the inner surface **12** of the housing **10** and protrudes from the outer surface **13** of the housing **10**, thus the blocking plate **221** abuts against the inner surface **12** correspondingly. The screw bolt **23** passes through the convex piece **222** and is screwed and fastened with the spherical joint **21**. In some embodiments, the screw bolt **23** passes through the sunk hole **223** of the bushing **22** and is screwed and fastened with the spherical joint **21**, thus the screw bolt **23** presses the bushing **22** toward the inner surface **12** of the housing **10**.

[0028] In some embodiments, the shock absorbing ring **30** is made of silicone or rubber, here is not intended to be limiting. The shock absorbing ring **30** may be made of any other buffering material. The shock absorbing ring **30** is an elastic hollow spherical member formed in an annular status and having two openings opposite to each other. The shock absorbing ring **30** sheathes a portion of the convex piece **222** which protrudes from the housing **10**, and elastically abuts between the outer surface **13** and the spherical joint **21**. In some embodiments, the shock absorbing ring **30** has a truncated opening **31** and a convex ring part **32** disposed at two sides and communicating with each other. The truncated opening **31** abuts against the spherical joint **21**. The convex ring part **32** sheathes the convex piece **222** and is latched in the opening **11** of the housing **10** to be positioned, thus one side of the shock absorbing ring **30** facing the housing **10** abuts against the outer surface **13** of the housing **10**.

[0029] The clamping claw **40** is disposed on the housing **10** and covers the inner surface **12** and the blocking plate **221**. The clamping claw **40** includes a cover case **41**, a fixed claw **42** and a moveable claw **43**. The shape of the cover case **41** is corresponding to the shape of the housing to cover on the housing **10**. The cover case **41** and the housing **10** are fastened by, for example, latching, buckling, adhering, welding or locking, etc., here is not intended to be limiting. The fixed claw **42** is fastened at one end of the cover case **41**, and the moveable claw **43** is moveably disposed at another end of the cover case **41**. The arranging direction in which the fixed claw **42** being arranged at the left side of the cover case **41** and the moveable claw **43** being arranged at the right side of the cover case **41** shown in FIG. **1** is served as an example according to one of the exemplary embodiments. The moveable claw **43** moves a distance in a direction away from the fixed claw **42**, thus a user may easily place and clamp the mobile phone A.

[0030] Please refer to FIG. **4** and FIG. **5**, the cover case **41** of the clamping claw **40** is fastened on the housing **10**, when the clamping claw **40** is applied with an external force to move or rotate the housing **10** toward the universal joint unit **20**, the shock absorbing ring **30** elastically clamped between the housing **10** and the spherical joint **21** generates an elastic deformation to absorb an impact force as shown in FIG. **5**, thus the impact force is prevented from being directly transferred to the spherical joint **21**, and the mobile phone holder is protected from being damaged.

[0031] Details are provided as follows. Please refer to FIG. **3** and FIG. **4**, the spherical joint **21** further includes a connecting seat **211** and a ball part **212**. The shape of the connecting seat **211** is substantially formed as the queen in the chess, here is not intended to be limiting. The connecting

seat **211** has a screw hole **2111** arranged toward a side surface of the shock absorbing ring **30** for the screw bolt **23** to be screwed in. The ball part **212** is fastened and disposed at a protruding portion at one side of the connecting seat **221** away from the screw hole **2111**, thus the ball part **212** is rotatably disposed in an accommodation slot **B1** of the mobile phone holder fastening seat **B**.

[0032] The connecting seat **211** further has a step **2112** arranged toward a side surface of the shock absorbing ring **30**. The step **2112** surrounds the screw hole **2111** and is arranged close to an outer edge of the connecting seat **211**. The truncated opening **31** of the shock absorbing ring **30** sheathes the step **2112** and elastically abuts against the connecting seat **211**.

[0033] The connecting seat **211** of the spherical joint **21** further has a position limiting recess **2113**. In some embodiments, the position limiting recess **2113** is disposed on a side surface of the connecting seat **211** which faces the shock absorbing ring **30**. The step **2112** surrounds a periphery of the position limiting recess **2113**, but the step **2112** is not connected to the position limiting recess **2113**. One end of the convex piece **222** away from the blocking plate **221** is latched in the position limiting recess **2113**, thus the bushing **22** and the connecting seat **211** of the spherical joint **21** are mutually positioned.

[0034] Details are provided as follows. The universal joint unit **20** further includes a pad **24**. The pad **24** has a through hole **241**. The through hole **241** of the pad **24** sheathes the convex piece **222** and the pad **24** is clamped between the inner surface **12** of the housing **10** and the blocking plate **221** of the bushing **22**, thus a stress applied by the bushing **22** to the housing **10** is reduced when the screw bolt **23** locks and fastens the spherical joint **21**. The pad **24** is made of a plastic material or a metal material, here is not intended to be limiting.

[0035] Details are provided as follows. The shape of the convex piece **222** is corresponding to the shape of the opening **11**, the shape of the through hole **241**, the shape of the convex ring part **32** and the shape of the position limiting recess **2113**. More detailly, the shape of the opening **11**, the shape of the through hole **241**, the shape of the convex ring part **32** and the shape of the position limiting recess **2113** are determined with respect to the shape of the convex piece **222**. According to the present disclosure, the convex piece **222** is a non-circular piece, the opening **11** is a non-circular slot, the through hole **241** is a non-circular hole, the convex ring part **32** is a non-circular ring, the position limiting recess **2113** is a non-circular recess, thus the bushing **22** is prevented from rotating relative to the housing **10**, the pad **24**, the shock absorbing ring **30** or the spherical joint **21**. In some embodiments, the convex piece **222** is substantially formed as a rectangular piece, here is not intended to be limiting. For example, the convex piece **222** may be a triangular piece, a pentagonal piece or any other geometrical piece.

[0036] According to the shock absorbing structure of the mobile phone holder, the cover case **41** of the clamping claw **40** is fastened on the housing **10**, and the shock absorbing ring **30** elastically abuts between the housing **10** and the spherical joint **20**, when the clamping claw **40** is applied with the external force to move or rotate the housing **10** toward the universal joint unit **20**, the shock absorbing ring **30** generates the elastic deformation to absorb the impact force, thus the impact force is prevented from being directly transferred to the spherical joint **21**, and the mobile phone holder is protected from being damaged.

[0037] While this disclosure has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of this disclosure set forth in the claims.

## Claims

1. A shock absorbing structure of a mobile phone holder, the shock absorbing structure comprising: a housing, comprising an opening, an inner surface and an outer surface, wherein the opening communicates with the inner surface and the outer surface; a universal joint unit, comprising a spherical joint, a bushing and a screw bolt, wherein the bushing comprises a blocking plate and a

convex piece, the convex piece passes through the opening, the blocking plate abuts against the inner surface, and the screw bolt passes through the convex piece and is fastened with the spherical joint; a shock absorbing ring, adapted to sheathe a portion of the convex piece protruding from the housing and elastically abutting between the outer surface and the spherical joint; and a clamping claw, disposed on the housing and covering the inner surface and the blocking plate; wherein, when the clamping claw is applied with an external force to move the housing toward the universal joint unit, the shock absorbing ring generates an elastic deformation to absorb an impact force.

**2.** The shock absorbing structure according to claim 1, wherein the shock absorbing ring is formed in a hollow ball shape, the shock absorbing ring comprises a truncated opening, and a periphery of the truncated opening abuts against the spherical joint.

**3.** The shock absorbing structure according to claim 1, wherein the spherical joint comprises a connecting seat and a ball part, the connecting seat comprises a screw hole for the screw bolt to be fastened, and the ball part is disposed at one side of the connecting seat away from the screw hole.

**4.** The shock absorbing structure according to claim 3, wherein the connecting seat comprises a step, the step surrounds the screw hole, and the shock absorbing ring elastically abuts against the step.

**5.** The shock absorbing structure according to claim 1, wherein the spherical joint comprises a position limiting recess, and one end of the convex piece away from the blocking plate is disposed in the position limiting recess.

**6.** The shock absorbing structure according to claim 1, wherein a shape of the convex piece is corresponding to a shape of the opening.

**7.** The shock absorbing structure according to claim 6, wherein the convex piece is a non-circular piece, and the opening is a non-circular slot.

**8.** The shock absorbing structure according to claim 1, wherein the universal joint unit comprises a pad, and the pad is adapted to sheathe the convex piece and clamped between the inner surface and the blocking plate.

**9.** The shock absorbing structure according to claim 1, wherein the clamping claw comprises a cover case, a fixed claw and a moveable claw, wherein the cover case correspondingly covers the housing, the fixed claw is fastened at one end of the cover case and the moveable claw is moveably disposed at another end of the cover case.

**10.** The shock absorbing structure according to claim 9, wherein the moveable claw moves a distance in a direction away from the fixed claw.

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