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### Travel pillow

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#### Abstract

A travel pillow includes a main body, a rotary frame disposed on the outer side of the main body, and a casing detachably disposed on the outer side of the rotary frame. The rotary frame includes a support arm, a rear support part, and an angle adjustment assembly. The support arm is rotatably connected to the rear support part, and the angle adjustment assembly is disposed between the support arm and the rear support part to adjust an angle between the support arm and the rear support part. The angle adjustment assembly includes a rotating shaft and a damper. The damper sleeves one end of the rotating shaft and includes a first fixing part and an adjustment end; the adjustment end includes a plurality of adjustment sections disposed at equal intervals around the rotating shaft. Each of the adjustment sections includes two adjustment sections.

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## Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS (1) This application is a continuation-in-part of International Patent Application No. PCT/CN2021/135592 with an international filing date

of Dec. 6, 2021, designating the United States, now pending, and further claims foreign priority benefits to Chinese Patent Application No. 202110160966.1 filed Feb. 5, 2021. The contents of all of the aforementioned applications, including any intervening amendments thereto, are incorporated herein by reference. Inquiries from the public to applicants or assignees concerning this document or the related applications should be directed to: Matthias Scholl P. C., Attn.: Dr. Matthias Scholl Esq., 245 First Street, 18th Floor, Cambridge, MA 02142.

## BACKGROUND

(1) The disclosure relates to a travel pillow.

(2) A conventional travel pillow normally includes two arms which cannot be bent to the desired angles or allows only a limited number of bends.

## SUMMARY

(3) To solve the aforesaid problems, an objective of the disclosure is to provide a travel pillow, comprising: a main body, a rotary frame disposed on the outer side of the main body, and a casing detachably disposed on the outer side of the rotary frame.

(4) The rotary frame comprises a support arm, a rear support part, and an angle adjustment assembly; the support arm is rotatably connected to the rear support part, and the angle adjustment assembly is disposed between the support arm and the rear support part to adjust an angle between the support arm and the rear support part; the angle adjustment assembly comprises a rotating shaft and a damper; the damper sleeves one end of the rotating shaft; the damper comprises a first fixing part and an adjustment end; the adjustment end comprises a plurality of adjustment sections disposed at equal intervals around the rotating shaft; each of the adjustment sections comprises a first adjustment section and a second adjustment section; the first adjustment section is closer to the first fixing part than the second adjustment section; and the first adjustment section has a greater outer diameter than the second adjustment section; the support arm comprises a first socket ring, and the rear support part comprises a second socket ring; the first socket ring is connected to the support arm and sleeves the rotating shaft; and the second socket ring is connected to the rear support part and sleeves the rotating shaft; and the rotating shaft comprises a second fixing part and a damping part which are disposed on both ends of the rotating shaft, respectively; the damper is detachably disposed around the damping part so as to rotate around the damping part; and the second fixing part comprises an external thread matched with a threaded nut.

(5) The casing is configured to cover and protect the rotary frame, giving an improved visual aesthetic. The rotary frame is used in cooperation with the main body. As the support arm rotates, the main body rotates as well, allowing the user's neck to be propped up at a comfortable angle. The support arm and the rear support part sleeve the rotating shaft; and the rotating shaft is used in conjunction with the damper to arrest the support arm at any position, thus enhancing the user experience.

(6) The plurality of adjustment sections is disposed at equal intervals around the rotating shaft to increase the durability and service life of the damper. The plurality of adjustment sections allows easy replacement of the adjustment end and thus can be matched with different rotating shafts in size. Thus, when the support arm rotates around the rotating shaft, the rotating shaft will not disengage from the rear support.

(7) In a class of this embodiment, the damper further comprises a damping cover comprising an internal thread; and the first fixing part comprises an external thread matched with the internal thread.

(8) The damping cover sleeves the adjustment end; the magnitude of damping is adjusted by tightening or loosening the damping cover on the damper, which allows for easy rotation of the support arm and prevents the second socket ring from sliding off the rotating shaft.

(9) In a class of this embodiment, the second fixing part has an irregular shape; the second socket ring comprises a connection part matched with the second fixing part in shape; and the connection

part sleeves the second fixing part.

(10) As the support arm rotates, the rotating shaft is stationary relative to the support arm, thus allowing the support arm to be arrested at any position.

(11) In a class of this embodiment, the second socket ring further comprises a first ring part and a second ring part; the rotating shaft is inserted through the second ring part, the first socket ring, and the second ring part successively, and is fixedly disposed to prevent the first socket ring from sliding off the rotating shaft.

(12) In a class of this embodiment, the travel pillow comprises a filler disposed between the rotary frame and the casing; and the filler comprises silicone.

(13) Silicone is tougher than a foam or cloth material, which facilitates stable connection between the rotary frame and the casing; and the filler has elasticity and thus protects the angle adjustment assembly from being damaged.

(14) The following advantages are associated with the travel pillow of the disclosure:

(15) 1. The angle adjustment assembly is configured to adjust the angle between the support arm and the rear support part so as to help a user's neck stay comfortable.

(16) 2. The rotating shaft is used in conjunction with the damper to arrest the support arm at any position, thus enhancing the user experience.

(17) 3. The plurality of adjustment sections is easy to replace, thus increasing the durability and service life of the damper.

(18) 4. The filler comprises silicone of which the hardness makes a more stable and detachable connection between the filler and the casing, and of which the softness enhances the user's experience.

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## Description

### BRIEF DESCRIPTION OF THE DRAWINGS

(1) FIG. 1 is a perspective view of a rotary frame according to Example 1 of the disclosure;

(2) FIG. 2 is a local enlarged view of part I in FIG. 1;

(3) FIG. 3 is a cross-sectional view of an angle adjustment assembly according to one example of the disclosure;

(4) FIG. 4 is an exploded view of an angle adjustment assembly according to one example of the disclosure;

(5) FIG. 5 is a perspective view of a rotating shaft in FIG. 3;

(6) FIG. 6 is a perspective view of a damper in FIG. 3;

(7) FIG. 7 is a perspective view of a damping cover in FIG. 3;

(8) FIG. 8 is a perspective view of a travel pillow according to Example 2 of the disclosure;

(9) FIG. 9 is an exploded view of a travel pillow in FIG. 8;

(10) FIG. 10 is a perspective view of a filler according to one example of the disclosure; and

(11) FIG. 11 is a perspective view of a travel pillow with a filler according to one example of the disclosure.

(12) In the drawings, the following reference numbers are used: **100**. Rotary frame; **10**. Support arm; **11**. First socket ring; **20**. Rear support part; **21**. Second socket ring; **21a**. Connection part; **30**. Angle adjustment assembly; **40**. Rotating shaft; **41**. Second fixing part; **42**. Damping part; **41a**. Threaded end; **41b**. Threaded nut; **50**. Damper; **51**. First fixing part; **51a**. External thread; **52**. Adjustment end; **53**. Adjustment section; **53a**. First adjustment section; **53b**. Second adjustment section; **54**. Damping cover; **54a**. Internal thread. **200**. Travel pillow; **210**. Main body; **211**. Space; **220**. Casing; **221**. First casing; **222**. Second casing; **230**. Filler; and **231**. Tab.

### DETAILED DESCRIPTION

(13) To further illustrate the disclosure, embodiments detailing a travel pillow are described below.

It should be noted that the following embodiments are intended to describe and not to limit the disclosure.

#### Example 1

(14) As shown in FIGS. 1-2, a rotary frame **100** comprises a support arm **10**, a rear support part **20**, and an angle adjustment assembly **30**. The support arm **10** is rotatably connected to the rear support part **20**, and the angle adjustment assembly **30** is disposed between the support arm **10** and the rear support part **20**.

(15) The support arm **10** comprises a first socket ring **11**, and the rear support part **20** comprises a second socket ring **21**. As shown in FIGS. 3-4, the angle adjustment assembly **30** comprises a rotating shaft **40** and a damper **50** sleeving the rotating shaft **40**. The first socket ring **11** is used in conjunction with the damper **50**, and the second socket ring **21** is used in conjunction with the rotating shaft **40**. An angle between the support arm **10** and the rear support part **20** is adjusted by the angle adjustment assembly.

(16) In certain examples, as shown in FIG. 5, the rotating shaft **40** comprises a second fixing part **41** and a damping part **42**. The second fixing part **41** comprises a threaded end **41a** away from the damping part **42**. Referring to FIG. 2, the second fixing part **41** further comprises a threaded end **41a** matched with a threaded nut **41b**; the second fixing part **41** has an irregular shape, such as a quadrangular prism (as shown in FIG. 5) or other prism shape; optionally, the second fixing part **41** is in the shape of a cylinder which is provided with edges or slots. The second socket ring **21** comprises a connection part **21a** matched with the second fixing part **41** in shape. The second fixing part **41** is disposed on the connection part to ensure that the second fixing part **41** and the second socket ring cannot rotate. The threaded nut **41b** is matched with the threaded end **41a** so as to prevent the second socket ring **21** from sliding off the rotating shaft **40**. As shown in FIGS. 3-4, the damper **50** and the first socket ring **11** are detachably disposed on the damping part **42**. As the support arm **10** rotates, the first socket ring **11** and the damper **50** rotate as well so as to arrest the support arm at any position.

(17) In certain examples, as shown in FIGS. 6, the damper **50** comprises a first fixing part **51** and an adjustment end **52** connected to the first fixing part **51**. The first fixing part **51** comprises an external thread **51a**. The first fixing part **51** comprises a distal end away from the adjustment end **52**, and the first socket ring **11** is disposed on the distal end. The adjustment end **52** comprises a plurality of adjustment sections **53** disposed at equal intervals around the damping part **42**. Each of the plurality of adjustment sections **53** comprises a first adjustment section **53a** and a second adjustment section **53b** connected to the first adjustment section **53a**. The first fixing part **51** comprises a proximal end connected to the first adjustment section **53a**. The first adjustment section **53a** has a greater outer diameter than the second adjustment section **53b**. The adjustment end **52** sleeves the rotating shaft **40**. As the support arm **10** rotates, the adjustment end **52** can arrest the support arm **10** in any position. The plurality of adjustment sections **53** is easy to replace, thus increasing the durability and service life of the damper **50**.

(18) Preferably, the second socket ring **21** further comprises a first ring part **2101** and a second ring part **2102**. A space is formed between the first ring part and the second ring part. The first socket ring **11** is inserted through the damper **50** into the space. The rotating shaft **40** comprises two second fixing parts **41** which are inserted through the first ring part, the first socket ring **11**, and the second ring part successively, to improve stability of the rotary frame **100**.

(19) In certain examples, as shown in FIG. 7, the damper **50** further comprises a damping cover **54** comprising an internal thread **54a**. The external thread **51a** is matched with the internal thread **54a** to ensure the first fixing part **51** is connected to the damping cover **54**. The magnitude of damping is adjusted by tightening or loosening the damping cover **54** on the first fixing part **51**.

(20) As the support arm **10** rotates, the first socket ring **10** rotates as well, causing the damper **50** to rotate around the rotating shaft **40**. Thus, the angle between the support arm **10** and the rear support part **20** is adjusted.

(21) In certain examples, when the damping cover **54** is tightened by a user, the magnitude of damping increases, thus increasing the force required to rotate the support arm **10**.

#### Example 2

(22) FIG. **8** is a perspective view of a travel pillow according to Example 2 of the disclosure. The travel pillow is U-shaped and comprises a notch for receiving a user's neck or head. The travel pillow provides a natural resting position for the user's neck or head, improving neck pain and upper back pain.

(23) As shown in FIG. **9**, the travel pillow **200** comprises a main body **210**, a casing **220**, and the rotary frame **100** as described in Example 1. The outer wall of the main body **210** comprises a space **211** matched with the rotary frame **100** in shape. The rotary frame **100** is disposed in the space **211** so as to be detachably connected to the main body **210**, which allows easy cleaning and replacement of the main body **210**. The casing **220** is detachably disposed on the outer side of the rotary frame **100**, which allows easy replacement of the rotary frame **100** and the casing **220**, thus reducing cost.

(24) Preferably, the rotary frame **100** is detachably disposed on the main body **210** using connection means, such as zippers, buttons, clamps, etc. The detachable connection means allow for easy cleaning, attachment and detachment of the main body **210** and the rotary frame **100**.

(25) The casing **220** comprises a first casing **221** and a second casing **222**. The casing **220** is configured to cover the outer side of the rotary frame **100** and gives an improved visual aesthetic. The first casing **221** is configured to protect the rear support part **20** from being damaged. The second casing **222** is configured to protect the support arm **10** from internal damage and thus achieve improved service life.

(26) The rotary frame **100** is used in cooperation with the main body **210**. As the support arm **10** rotates, the main body **210** rotates as well, allowing the user's neck to be propped up at a comfortable angle. The angle adjustment decreases the resistive force produced by the rotation of the support arm and improves the service life of the travel pillow **200**.

(27) Preferably, as shown in FIGS. **10** and **11**, the travel pillow **200** comprises a filler **230** disposed between the rotary frame **100** and the casing **220**. The filler **230** comprises silicone or rubber for improving user's comfort. The silicone or rubber is tougher than a foam or cloth material, which facilitates stable connection between the rotary frame **100** and the casing **220**. The casing **220** is further configured to protect the filler **230** from being damaged. The filler **230** has elasticity and thus protects the angle adjustment assembly **30** from being damaged.

(28) The filler **230** further comprises a tab **231**, comprising a hang hole **231**. When the user is wrapped into the travel pillow **200**, the tab **231** hang down to cover the zipper; when the travel pillow **200** is not in use by the user, the tab **231** allows the travel pillow to be placed on the hook.

(29) The tab **231** and the filler **230** are made of the same elastic material, such as silicone.

(30) The travel pillow **200** further comprises a pressure part (not shown), comprising a pressure surface (not shown). The first casing **221** comprises a distal surface away from the rotary frame. The pressure part is disposed on the distal end of the first casing **221**, and the pressure surface is a flat surface away from the rotary frame.

(31) The pressure surface is positioned against an object to ensure the user's neck is propped up at a comfortable angle. When the pressure surface is a curved surface, the travel pillow **200** may slip and slide around, thus diminishing the user experience.

(32) Preferably, the pressure part is in the shape of an ellipse, a circle, or a polygon. The distal end of the first casing **221** comprises a pressure area (not shown) in which the pressure part is fixedly disposed. Preferably, the pressure part and the pressure area are in the shape of an ellipse. The ellipse has more area than the circle and thus is easier to be connected to the first casing **221**. The ellipse has more rounded corners than the polygon and thus prevents a sharp edge from damaging to the body or other objects. Optionally, the pressure part and the pressure area are in the shape of a square with rounded corners without departing from the scope and spirit of the disclosure.

(33) Preferably, the pressure part further comprises a fixing member (not shown) connected to any side of the pressure part. For examples, the travel pillow **200** comprises a top part and a bottom part; the top part props up the user's neck, and the bottom part is position against the user's shoulder. The pressure part comprises a first end near the top part of the travel pillow, and a second end near the bottom part of the travel pillow. The fixing member is connected to the first end, and/or the second end, and/or both ends of the pressure part.

(34) The first casing **221** further comprises a slot (not shown) extending at least partially on one side of the pressure area. The slot is used in cooperation with the fixing part. For examples, the fixing part is disposed on the first end, the second end, or both ends of the pressure part. The slot is disposed on the first end, the second end, or both ends of the pressure part. The slot is used in cooperation with the fixing part to improve the connection between the pressure part and the pressure area. The fixing member can be removed by hand, which allows for easy detachment of the pressure part and the pressure area.

(35) It will be obvious to co those skilled in the art that changes and modifications may be made, and therefore, the aim in the appended claims is to cover all such changes and modifications.

## Claims

1. A travel pillow, comprising: a main body; a rotary frame disposed on an outer side of the main body; and a casing detachably disposed on an outer side of the rotary frame; wherein: the rotary frame comprises a support arm, a rear support part, and an angle adjustment assembly; the support arm is rotatably connected to the rear support part, and the angle adjustment assembly is disposed between the support arm and the rear support part to adjust an angle between the support arm and the rear support part; the angle adjustment assembly comprises a rotating shaft and a damper; the damper sleeves one end of the rotating shaft; the damper comprises a first fixing part and an adjustment end; the adjustment end comprises a plurality of adjustment sections disposed at equal intervals around the rotating shaft; each of the adjustment sections comprises a first adjustment section and a second adjustment section; the first adjustment section is closer to the first fixing part than the second adjustment section; and the first adjustment section has a greater outer diameter than the second adjustment section; the support arm comprises a first socket ring, and the rear support part comprises a second socket ring; the first socket ring is connected to the support arm and sleeves the rotating shaft; and the second socket ring is connected to the rear support part and sleeves the rotating shaft; and the rotating shaft comprises a second fixing part and a damping part which are disposed on both ends of the rotating shaft, respectively; the damper is detachably disposed around the damping part so as to rotate around the damping part; and the second fixing part comprises an external thread matched with a threaded nut.
  2. The travel pillow of claim 1, wherein the damper further comprises a damping cover comprising an internal thread; and the first fixing part comprises an external thread matched with the internal thread.
  3. The travel pillow of claim 1, wherein the second fixing part has an irregular shape; the second socket ring comprises a connection part matched with the second fixing part in shape; and the connection part sleeves the second fixing part.
  4. The travel pillow of claim 1, wherein the second socket ring further comprises a first ring part and a second ring part; the rotating shaft is inserted through the second ring part, the first socket ring, and the second ring part successively, and is fixedly disposed to prevent the first socket ring from sliding off the rotating shaft.
  5. The travel pillow of claim 1, wherein the travel pillow comprises a filler disposed between the rotary frame and the casing; and the filler comprises silicone.
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