CLAIMS

What is claimed is:

1. ~~A folding apparatus, comprising a first housing,~~ A rotating mechanism~~, and a second housing that are connected sequentially, wherein the rotating mechanism can deform, so that the first housing and the second housing are folded or unfolded relative to each other;~~

~~the rotating mechanism comprises~~ comprising a main shaft assembly, a first fixed bracket, a first transmission arm, a first rotating arm, a second fixed bracket, a second transmission arm, and a second rotating arm~~;~~, wherein

~~the first fixed bracket is fastened to the first housing,~~ the first transmission arm comprises a sliding end and a rotating end, the sliding end of the first transmission arm is slidably connected to the first fixed bracket, the rotating end of the first transmission arm is rotatably connected to the main shaft assembly, one end of the first rotating arm is rotatably connected to the first fixed bracket, and the other end of the first rotating arm is rotatably connected to the main shaft assembly~~;~~, and wherein

~~the second fixed bracket is fastened to the second housing,~~ the second transmission arm comprises a sliding end and a rotating end, the sliding end of the second transmission arm is slidably connected to the second fixed bracket, the rotating end of the second transmission arm is rotatably connected to the main shaft assembly, one end of the second rotating arm is rotatably connected to the second fixed bracket, and the other end of the second rotating arm is rotatably connected to the main shaft assembly.

2. The ~~folding apparatus~~rotating mechanism according to claim 1, wherein the main shaft assembly comprises a main inner shaft and a main outer shaft that is fastened to the main inner shaft, and when the ~~first housing and the second housing are folded relative to each other~~rotating mechanism is folded to a closed state, the main inner shaft is located between the main outer shaft and each of the first fixed bracket and the second fixed bracket~~;~~.

~~a rotation center around which~~3. The rotating mechanism according to claim 2, wherein the first transmission arm ~~rotates relative to~~ and the main shaft assembly ~~is close to~~rotates around a first rotation center, a distance between the first rotation center and the main inner shaft ~~and away from~~ is less than a distance between the first rotation center and the main outer shaft~~, and a rotation center around which the first rotating arm rotates relative to~~;

wherein the second transmission arm and the main shaft assembly ~~is close to~~ rotates around a second rotation center, a distance between the second rotation center and the main outer shaft ~~and away from~~ is less than a distance between the second rotation center and the main inner shaft; ~~and~~

~~a rotation center around which~~wherein the second transmission arm and the main shaft assembly rotates ~~relative to the main shaft assembly is close to~~around a third rotation center, a distance between the third center and the main inner shaft ~~and away from~~is less than a distance between the third rotation center and the main outer shaft~~, and a rotation center around which~~; and

wherein the second rotating arm ~~rotates relative to~~and the main shaft assembly ~~is close to~~rotates around a fourth rotation center, a distance between the fourth rotation center and the main outer shaft ~~and away from~~is less than a distance between the fourth rotation center and the main inner shaft.

~~3~~4. The ~~folding apparatus~~rotating mechanism according to claim 2, wherein the main inner shaft and the main outer shaft jointly enclose a plurality of arc-shaped grooves;

the rotating end of the first transmission arm is arc-shaped and is disposed in ~~one~~a first arc-shaped groove of the plurality of arc-shaped grooves, and an end that is of the first rotating arm and that is rotatably connected to the main shaft assembly is arc-shaped and is disposed in ~~another~~a second arc-shaped groove of the plurality of arc-shaped grooves; and

the rotating end of the second transmission arm is arc-shaped and is disposed in ~~another~~a third arc-shaped groove of the plurality of arc-shaped grooves, and an end that is of the second rotating arm and that is rotatably connected to the main shaft assembly is arc-shaped and is disposed in ~~another~~a fourth arc-shaped groove of the plurality of arc-shaped grooves.

~~4~~5. The ~~folding apparatus~~rotating mechanism according to ~~claim 3~~any one of claims 1 to 4, wherein there is a ~~first~~fifth arc-shaped groove on the first fixed bracket, and an end that is of the first rotating arm and that is rotatably connected to the first fixed bracket is arc-shaped and is disposed in the ~~first~~fifth arc-shaped groove; and

there is a ~~second~~sixth arc-shaped groove on the second fixed bracket, and an end that is of the second rotating arm and that is rotatably connected to the second fixed bracket is arc-shaped and is disposed in the ~~second~~sixth arc-shaped groove.

~~5~~6. The ~~folding apparatus~~rotating mechanism according to claim ~~4~~5, wherein the first fixed bracket comprises a first fixed base and a first fastener, and the first fastener is fastened to the first

fixed base, and encloses the ~~first~~fifth arc-shaped groove with the first fixed base.

~~6~~7. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~5~~6, wherein there is a first sliding slot ~~and~~on the first fixed bracket, the sliding end of the first transmission arm is disposed in the first sliding slot.

8. The rotating mechanism according to claim 7, there is a first accommodating slot on the first fixed bracket, the first accommodating slot communicates with the first sliding slot, the rotating mechanism further comprises a first limiting component, and the first limiting component is disposed in the first accommodating slot;

~~the sliding end of the first transmission arm is disposed in the first sliding slot,~~ there is a first recessed area and a second recessed area on the sliding end of the first transmission arm, and the second recessed area is located between the first recessed area and the rotating end of the first transmission arm; and

when the ~~first housing and the second housing are unfolded relative to each other~~rotating mechanism is unfolded to a flattened state, the first limiting component is partially clamped into the first recessed area, or when the ~~first housing and the second housing are folded relative to each other~~rotating mechanism is folded to a closed state, the first limiting component is partially clamped into the second recessed area.

~~7~~9. The ~~folding apparatus~~rotating mechanism according to claim ~~6~~8, wherein there is a recessed guiding space on a side wall of the first sliding slot, the sliding end of the first transmission arm comprises a first flange on a circumferential side, the first flange is disposed in the guiding space of the first sliding slot, and the first recessed area and the second recessed area are formed on the first flange.

~~8~~10. The ~~folding apparatus~~rotating mechanism according to claim ~~6~~8 or ~~7~~9, wherein the first limiting component comprises a first bracket and a first elastic part, the first bracket comprises a control part and an abutting part, one end of the first elastic part is disposed on the control part of the first bracket, the other end of the first elastic part abuts against a slot wall of the first accommodating slot, and the abutting part of the first bracket is clamped to the sliding end of the first transmission arm.

~~9~~11. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~8~~10, wherein the rotating mechanism further comprises a first synchronous swing arm and a second synchronous swing arm;

the first synchronous swing arm comprises a rotating end and a movable end, the rotating end of the first synchronous swing arm is rotatably connected to the main shaft assembly, the movable end of the first synchronous swing arm is movably connected to the first fixed bracket~~, and when the first housing and the second housing are folded or unfolded relative to each other, the movable end of the first synchronous swing arm slides and rotates relative to the first fixed bracket; and~~; and

the second synchronous swing arm comprises a rotating end and a movable end, the rotating end of the second synchronous swing arm is rotatably connected to the main shaft assembly, the rotating end of the second synchronous swing arm is engaged with the rotating end of the first synchronous swing arm, the movable end of the second synchronous swing arm is movably connected to the second fixed bracket~~, and~~ .

12. The rotating mechanism according to any one of claims 11, when the ~~first housing and the second housing are~~rotating mechanism is folded or unfolded relative to each other, the movable end of the first synchronous swing arm slides and rotates relative to the first fixed bracket, the movable end of the second synchronous swing arm slides and rotates relative to the second fixed bracket.

~~10~~13. The ~~folding apparatus~~rotating mechanism according to claim ~~9~~11 or 12, wherein the rotating end of the first synchronous swing arm comprises a first rotating body, a first rotating shaft, and a first gear, the first rotating shaft is fastened to a front facet and/or a back facet of the first rotating body, the first gear is fastened to a circumferential side facet of the first rotating body, and the first rotating shaft is rotatably connected to the main shaft assembly; and

the rotating end of the second synchronous swing arm comprises a second rotating body, a second rotating shaft, and a second gear, the second rotating shaft is fastened to a front facet and/or a back facet of the second rotating body, the second gear is fastened to a circumferential side facet of the second rotating body, the second rotating shaft is rotatably connected to the main shaft assembly, and the second gear is engaged with the first gear.

~~11~~14. The ~~folding apparatus~~rotating mechanism according to ~~claim 9 or 10~~any one of claims 11 to 13, wherein there is a third sliding slot on the first fixed bracket, there is a recessed guiding space on a slot wall of the third sliding slot, the movable end of the first synchronous swing arm has a third rotating shaft, the first synchronous swing arm is disposed in the third sliding slot, and the third rotating shaft is disposed in the guiding space of the third sliding slot; and

there is a fourth sliding slot on the second fixed bracket, there is a recessed guiding space on a slot wall of the fourth sliding slot, the movable end of the second synchronous swing arm has a fourth rotating shaft, the second synchronous swing arm is disposed in the fourth sliding slot, and the fourth rotating shaft is disposed in the guiding space of the fourth sliding slot.

~~12~~15. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~11~~14, wherein the rotating mechanism further comprises a first supporting plate and a second supporting plate~~, the first supporting plate is fixedly connected to the sliding end of the first transmission arm, and the second supporting plate is fixedly connected to the sliding end of the second transmission arm; and~~

when the ~~first housing and the second housing are~~rotating mechanism is unfolded~~ relative to each other~~ to the flattened state, the first supporting plate is flush with the second supporting plate, the first supporting plate is laid between the first fixed bracket and the main shaft assembly, and the second supporting plate is laid between the second fixed bracket and the main shaft assembly; or

when the ~~first housing and the second housing are~~rotating mechanism is folded~~ relative to each other~~ to the closed state, the first supporting plate is stacked on a side that is of the first fixed bracket and that is away from the second fixed bracket, and the second supporting plate is stacked on a side that is of the second fixed bracket and that is away from the first fixed bracket.

~~13~~16. The ~~folding apparatus~~rotating mechanism according to claim ~~12~~15, wherein the main shaft assembly has a supporting surface, and when the ~~first housing and the second housing are~~rotating mechanism is folded~~ relative to each other~~ to the closed state, the supporting surface of the main shaft assembly is exposed relative to the first supporting plate and the second supporting plate, and the supporting surface of the main shaft assembly is arc-shaped.

~~14~~17. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~13~~16, wherein the rotating mechanism further comprises a first shielding plate and a second shielding plate, the first shielding plate is fixedly connected to the sliding end of the first transmission arm, and the second shielding plate is fixedly connected to the sliding end of the second transmission arm; and

when the ~~first housing and the second housing are~~rotating mechanism is unfolded~~ relative to each other~~ to the flattened state, the first shielding plate is flush with the second shielding plate, the first shielding plate is laid between the first fixed bracket and the main shaft assembly, and the

second shielding plate is laid between the second fixed bracket and the main shaft assembly~~; or~~.

~~when the first housing and the second housing are folded relative to each other to the closed state, the first shielding plate is located between the first fixed bracket and the first housing, and the second shielding plate is located between the second fixed bracket and the second housing.~~

~~15~~18. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~14~~17, wherein the rotating mechanism further comprises a third transmission arm, a third fixed bracket, a fourth transmission arm, and a fourth fixed bracket, ~~the third fixed bracket is fastened to the first housing,~~ one end of the third transmission arm is rotatably connected to the main shaft assembly, the other end of the third transmission arm is slidably connected to the third fixed bracket, ~~the fourth fixed bracket is fastened to the second housing,~~ one end of the fourth transmission arm is rotatably connected to the main shaft assembly, and the other end of the fourth transmission arm is slidably connected to the fourth fixed bracket.

~~16~~19. The ~~folding apparatus~~rotating mechanism according to claim ~~15~~18, wherein a rotation center around which the third transmission arm rotates relative to the main shaft assembly and the rotation center around which the first transmission arm rotates relative to the main shaft assembly are collinear; and

a rotation center around which the fourth transmission arm rotates relative to the main shaft assembly and the rotation center around which the second transmission arm rotates relative to the main shaft assembly are collinear.

~~17~~20. The rotating mechanism according to any one of claims 1 to 14, wherein the rotating mechanism further comprises a first supporting plate and a second supporting plate, the first supporting plate is fixedly connected to the sliding end of the first transmission arm, and the second supporting plate is fixedly connected to the sliding end of the second transmission arm.

21. An electronic device, comprising a flexible display, a first housing, a second housing and the ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~16~~20, wherein the flexible display comprises a first ~~non-bending~~ part, a ~~bending~~second part, and a ~~second non-bending~~third part that are sequentially arranged, the first ~~non-bending~~ part is fastened to ~~a~~the first housing, the ~~second non-bending~~third part is fastened to ~~a~~the second housing, and when the first housing and the second housing are folded or unfolded relative to each other, the ~~bending~~second part deforms.