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~~ comprisinges a main shaft assembly, a first fixed bracket, a second fixed bracket, a first transmission arm, a first rotating arm, a second transmission arm, and a second rotating arm~~;~~, wherein

~~the first fixed bracket is fastened to the first housing, and the second fixed bracket is fastened to the second 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 second 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 rotating end of the first transmission arm, and the other end of the first rotating arm is rotatably connected to the first fixed bracket~~,~~; and wherein

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 first 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 rotating end of the second transmission arm, and the other end of the second rotating arm is rotatably connected to the second fixed bracket.

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 rotating mechanism is~~first housing and the second housing are~~ folded ~~relative to each other~~ 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;

the rotating end of the first transmission arm and the main shaft assembly~~the first transmission arm~~ rotates around a first rotation center, a distance between the first rotation center ~~is close to~~and the main inner shaft is less than a distance between the first rotation center and ~~away from~~ the main outer shaft, and a distance between the first rotation center ~~is close to~~and the second fixed bracket ~~and~~ is less than a distance between the first rotation center ~~away from~~and the first fixed

bracket; and

the rotating end of the second transmission arm and the main shaft assembly~~the second transmission arm~~ rotates around a second rotation center, a distance between the second rotation center ~~is close to~~and the main inner shaft is less than a distance between the second rotation center and ~~away from~~ the main outer shaft, and a distance between the second rotation center ~~is close to~~and the first fixed bracket is less than a distance between the second rotation center and ~~away from~~ the second fixed bracket.

3. 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 disposed in one of the arc-shaped grooves, and the rotating end of the second transmission arm is arc-shaped and disposed in another arc-shaped groove.

4. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to 3, wherein there is a first sliding slot on the second fixed bracket,

the sliding end of the first transmission arm is disposed in the first sliding slot.

5. The rotating mechanism according to claim 4, wherein there is a first recessed area, and a second recessed area on the second fixed bracket, both the first recessed area and the second recessed area communicate with the first sliding slot, and the first recessed area is located between the main shaft assembly and the second recessed area;

the rotating mechanism further comprises a first limiting component, the first limiting component is disposed at the sliding end of the first transmission arm~~, and the sliding end of the first transmission arm is disposed in the first sliding slot~~; and

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

~~5~~6. The ~~folding apparatus~~rotating mechanism according to claim ~~4~~5, wherein there is a first accommodating slot at the sliding end of the first transmission arm, and the first limiting component is disposed in the first accommodating slot; and

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 second fixed bracket.

~~6~~7. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~5~~6, 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 second transmission arm, and the second supporting plate is fixedly connected to the sliding end of the first transmission arm~~; and~~.

8. The rotating mechanism according to claim 7,

when the rotating mechanism is~~first housing and the second housing are~~ unfolded ~~relative to each other~~ to the flattened state, the first supporting plate is flush with the second supporting plate~~,~~.

9. The rotating mechanism according to claim 7 or 8, wherein when the rotating mechanism is unfolded to the flattened state, 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 rotating mechanism is~~first housing and the second housing are~~ 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.

~~7~~10. The ~~folding apparatus~~rotating mechanism according to claim ~~6~~7, wherein the main shaft assembly has a supporting surface, and when the rotating mechanism is~~first housing and the second housing are~~ 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.

~~8~~11. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~7~~10, 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 rotating mechanism is~~first housing and the second housing are~~ 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~~.

~~9~~12. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~8~~11, 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

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 when the first housing and the second housing are folded or unfolded relative to each other, the movable end of the second synchronous swing arm slides and rotates relative to the second fixed bracket~~.

1~~0~~3. The ~~folding apparatus~~rotating mechanism according to claim ~~9~~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~~ 12 or 1~~0~~3, wherein the rotating mechanism further comprises a first connector and a second connector, the first connector is slidably disposed on the first fixed bracket, the movable end of the first synchronous swing arm is rotatably connected to the first connector, the second connector is slidably disposed on the second fixed bracket, and the movable end of the second synchronous swing arm is rotatably connected to the second connector.

~~12~~15. The ~~folding apparatus~~rotating mechanism according to any one of claims 1 to ~~11~~14, wherein the rotating mechanism further comprises a third fixed bracket, a fourth fixed bracket, a third transmission arm, a fourth transmission arm, and a gear drive assembly;

~~the third fixed bracket is fastened to the first housing, and the fourth fixed bracket is fastened to the second housing;~~

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

the fourth transmission arm comprises a sliding end and a rotating end, the sliding end of the fourth transmission arm is slidably connected to the ~~second~~ fourth fixed bracket, the rotating end of the fourth transmission arm is rotatably connected to the main shaft assembly, and the rotating end of the fourth transmission arm is engaged with the rotating end of the third transmission arm by using the gear drive assembly.

~~13~~16. The ~~folding apparatus~~rotating mechanism according to claim ~~12~~15, wherein a rotation center around which the third transmission arm rotates relative to the main shaft assembly and a rotation center around which the second 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 a rotation center around which the first transmission arm rotates relative to the main shaft assembly are collinear.

~~14~~17. 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 ~~13~~16,

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 fixed bracket is fastened to the first housing, and the second fixed bracket is fastened

to the second housing;

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 se~~bending~~cond part deforms.