CLAIMS

What is claimed is:

1. A folding mechanism (32), comprising a middle housing (321), a first fixing bracket (322), a second fixing bracket (323), a first swing arm (326), a second swing arm (327), a first support plate (324), and a second support plate (325), wherein the first fixing bracket (322) is rotatably connected to the middle housing (321), and the second fixing bracket (323) is rotatably connected to the middle housing (321);

the first swing arm (326) comprises a rotation end (3261) and a movable end (3262), the rotation end (3261) of the first swing arm (326) is rotatably connected to the middle housing (321), and the movable end (3262) of the first swing arm (326) is slidably connected to the first fixing bracket (322); and the second swing arm (327) comprises a rotation end (3271) and a movable end (3272), the rotation end (3271) of the second swing arm (327) is rotatably connected to the middle housing (321), and the movable end (3272) of the second swing arm (327) is slidably connected to the first fixing bracket (322);

the first support plate (324) is rotatably connected to the first fixing bracket (322), and the first support plate (324) is slidably connected to the movable end (3262) of the first swing arm (326); and the second support plate (325) is rotatably connected to the second fixing bracket (323), and the second support plate (325) is slidably connected to the movable end (3272) of the second swing arm (327); and

when the folding mechanism (32) is in an open state, a support surface (3241) of the first support plate (324) is flush with a support surface (3251) of the second support plate (325); or when the folding mechanism (32) is in a closed state, a support surface (3241) of the first support plate (324) and a support surface (3251) of the second support plate (325) are disposed opposite to each other, and are away from each other in a direction close to the middle housing (321).

2. The folding mechanism (32) according to claim 1, wherein the middle housing (321) comprises an outer cover (3211), and the outer cover (3211) is bent to form inner space (3213); and

when the folding mechanism (32) is in the open state, the first support plate (324) covers a part of the inner space (3213), and the second support plate (325) covers a part of the inner space (3213); or

when the folding mechanism (32) is in the closed state, the first support plate (324) partially extends into the inner space (3213), and the second support plate (325) partially extends into the inner space (3213).

3. The folding mechanism (32) according to claim 2, wherein when the folding mechanism (32) is in the open state, the first support plate (324) is spliced with the second support plate (325).

4. The folding mechanism (32) according to any one of claims 1 to 3, wherein the first fixing bracket (322) comprises a first arc-shaped arm (322b), the first arc-shaped arm (322b) is rotatably connected to the middle housing (321), the second fixing bracket (323) comprises a second arc-shaped arm (323b), and the second arc-shaped arm (323b) is rotatably connected to the middle housing (321).

5. The folding mechanism (32) according to any one of claims 1 to 4, wherein the movable end (3272) of the second swing arm (327) is further rotatably connected to the first fixing bracket (322), and the movable end (3272) of the second swing arm (327) is further rotatably connected to the first fixing bracket (322).

6. The folding mechanism (32) according to any one of claims 1 to 4, wherein the first fixing bracket (322) comprises a first fixed body (322a), the first fixed body (322a) is provided with a first sliding slot (3225), the second fixing bracket (323) comprises a second fixed body (323a), the second fixed body (323a) is provided with a second sliding slot (3235), and when the folding mechanism (32) is in the closed state, in the direction close to the middle housing (321), an extension direction of the second sliding slot (3235) and an extension direction of the first sliding slot (3225) are away from each other; and

the movable end (3262) of the first swing arm (326) comprises a first hinge (3262a), the first hinge (3262a) is mounted in the first sliding slot (3225), and can slide in the first sliding slot (3225); and the movable end (3272) of the second swing arm (327) comprises a second hinge (3272a), and the second hinge (3272a) is mounted in the second sliding slot (3235), and can slide in the second sliding slot (3235).

7. The folding mechanism (32) according to claim 6, wherein the first hinge (3262a) can further rotate in the first sliding slot (3225), and the second hinge (3272a) can further rotate in the second sliding slot (3235).

8. The folding mechanism (32) according to claim 7, wherein the first support plate (324) is further rotatably connected to the movable end (3262) of the first swing arm (326), and the second

support plate (325) is further rotatably connected to the movable end (3272) of the second swing arm (327).

9. The folding mechanism (32) according to claim 8, wherein the folding mechanism (32) further comprises a first rotatable connecting member (3210) and a second rotatable connecting member (3220); the first rotatable connecting member (3210) comprises a rotation part (3210a) and a sliding part (3210b), the rotation part (3210a) of the first rotatable connecting member (3210) is rotatably connected to the movable end (3262) of the first swing arm (326), and the sliding part (3210b) of the first rotatable connecting member (3210) is slidably connected to the first support plate (324); and the second rotatable connecting member (3220) comprises a rotation part (3220a) and a sliding part (3220b), the rotation part (3220a) of the second rotatable connecting member (3220) is rotatably connected to the movable end (3272) of the second swing arm (327), and the sliding part (3220b) of the second rotatable connecting member (3220) is slidably connected to the second support plate (325).

10. The folding mechanism (32) according to claim 9, wherein the movable end (3262) of the first swing arm (326) is claw-shaped, the movable end (3262) of the first swing arm (326) comprises a plurality of first claw teeth (3262b) that are spaced from each other, the first hinge (3262a) comprises two parts, and the two parts of the first hinge (3262a) are respectively located at two sides of the plurality of first claw teeth (3262b), and are connected to different first claw teeth (3262b); and

the rotation part (3210a) of the first rotatable connecting member (3210) is embedded between the plurality of first claw teeth (3262b), the folding mechanism (32) further comprises a first rotatable connecting shaft (3230), and the first rotatable connecting shaft (3230) is inserted into the first hinge (3262a), the plurality of first claw teeth (3262b), and the rotation part (3210a) of the first rotatable connecting member (3210).

11. The folding mechanism (32) according to claim 10, wherein the rotation part (3210a) of the first rotatable connecting member (3210) is claw-shaped, the rotation part (3210a) of the first rotatable connecting member (3210) comprises a plurality of third claw teeth (3210c) that are spaced from each other, and the plurality of third claw teeth (3210c) and the plurality of first claw teeth (3262b) are arranged in a staggered manner.

12. The folding mechanism (32) according to claim 10 or 11, wherein the movable end (3262) of the first swing arm (326) is provided with a first rotation hole (3262c), the first rotation hole

(3262c) penetrates through the first hinge (3262a) and the plurality of first claw teeth (3262b), a rotation center of the first rotation hole (3262c) coincides with a rotation center of the first hinge (3262a), and the first rotatable connecting shaft (3230) is inserted into the first rotation hole (3262c).

13. The folding mechanism (32) according to any one of claims 9 to 12, wherein the first support plate (324) comprises a first plate body (3242) and a first sliding rail (3244), the support surface (3241) of the first support plate (324) is formed on the first plate body (3242), the first plate body (3242) comprises a fixing surface (3246), the fixing surface (3246) is disposed back to the support surface (3241) of the first support plate (324), the first sliding rail (3244) is fastened on the fixing surface (3246), and the sliding part (3210b) of the first rotatable connecting member (3210) is slidably connected to the first sliding rail (3244).

14. The folding mechanism (32) according to any one of claims 7 to 13, wherein the first fixed body (322a) is further provided with a first mounting groove (3226), the first mounting groove (3226) communicates with the first sliding slot (3225), the folding mechanism (32) further comprises a first stopper (329), the first stopper (329) is mounted in the first mounting groove (3226), and when the folding mechanism (32) is in the open state, the first stopper (329) abuts against the first hinge (3262a).

15. The folding mechanism (32) according to claim 14, wherein the first stopper (329) comprises a holder (3291) and an elastic part (3292), the holder (3291) comprises a control part (3291a) and a pressing part (3291b), one end of the elastic part (3292) is mounted on the control part (3291a) of the holder (3291), the other end of the elastic part (3292) abuts against a groove wall of the first mounting groove (3226), and when the folding mechanism (32) is in the open state, the pressing part (3291b) of the holder (3291) abuts against the first hinge (3262a).

16. The folding mechanism (32) according to any one of claims 7 to 15, wherein the first fixed body (322a) comprises a top surface (3221), a bottom surface (3222), and a second side surface (3224), the top surface (3221) and the bottom surface (3222) are disposed back to each other, the second side surface (3224) is located between the top surface (3221) and the bottom surface (3222), the top surface (3221) faces the first support plate (324), the second side surface (3224) faces the middle housing (321), and the top surface (3221) and the bottom surface (3222) are close to each other in a direction close to the second side surface (3224).

17. The folding mechanism (32) according to claim 16, wherein in the direction close to the

~~second side surface (3224), the extension direction of the first sliding slot (3225) and the bottom surface (3222) are close to each other.~~

~~18. The folding mechanism (32) according to any one of claims 1 to 17, wherein the folding mechanism (32) further comprises a plurality of synchronous gears (3281), each of the synchronous gears (3281) is rotatably connected to the middle housing (321), two adjacent synchronous gears (3281) are engaged with each other, and the rotation end (3261) of the first swing arm (326) is engaged with the rotation end (3271) of the second swing arm (327) by using the plurality of synchronous gears (3281).~~

~~19. The folding mechanism (32) according to claim 18, wherein the rotation end (3261) of the first swing arm (326), the plurality of synchronous gears (3281), and the rotation end (3271) of the second swing arm (327) are arranged in an arc shape.~~

~~20~~1. A folding mechanism (12), comprising a middle housing (121), a first fixing bracket (122), a second fixing bracket (123), a first swing arm (126), a second swing arm (127), a first support plate (124), and a second support plate (125), wherein

the first support plate (124) is rotatably connected to the first fixing bracket (122), and the first support plate (124) is rotatably connected to the middle housing (121);

the second support plate (125) is rotatably connected to the second fixing bracket (123), and the second support plate (125) is rotatably connected to the middle housing (121);

the first swing arm (126) comprises a first rotation end (1262) and a first sliding end (1261), wherein the first rotation end (1262) of the first swing arm (126) is rotatably connected to the middle housing (121), the first sliding end (1261) of the first swing arm (126) is slidably connected to the first fixing bracket (122);

the second swing arm (127) comprises a second rotation end (1272) and a second sliding end (1271), wherein the second rotation end (1272) of the second swing arm (127) is rotatably connected to the middle housing (121), the second sliding end (1271) of the second swing arm (127) is slidably connected to the second fixing bracket (123).

2. The folding mechanism (12) according to claim 1,

~~one end of the first swing arm (126) is slidably connected to the first fixing bracket (122), the other end of the first swing arm (126) is slidably connected to the middle housing (121), one end of the second swing arm (127) is slidably connected to the second fixing bracket (123), the other~~

~~end of the second swing arm (127) is rotatably connected to the middle housing (121), the first support plate (124) is rotatably connected to the first fixing bracket (122) and is rotatably connected to the middle housing (121), and the second support plate (125) is rotatably connected to the second fixing bracket (123) and is rotatably connected to the middle housing (121); and~~

when the folding mechanism (12) is in an open state, a support surface (1241) of the first support plate (124) is flush with a support surface (1251) of the second support plate (125); ~~or~~ and when the folding mechanism (12) is in a closed state, a support surface (1241) of the first support plate (124) and a support surface (1251) of the second support plate (125) ~~are disposed opposite to each other, and~~ are away from each other in a direction close to the middle housing (121).

~~21~~3. The folding mechanism (12) according to claim ~~20~~1 or 2, wherein the middle housing (121) comprises an outer cover (1211), and the outer cover (1211) is bent to form inner space (1213); and

when the folding mechanism (12) is in ~~the~~an open state, the first support plate (124) covers a part of the inner space (1213), and the second support plate (125) covers a part of the inner space (1213); ~~or~~and

when the folding mechanism (12) is in the closed state, the first support plate (124) partially extends into the inner space (1213), and the second support plate (125) partially extends into the inner space (1213).

4. The folding mechanism (12) according to any one of claims 1 to 3, wherein when the folding mechanism (12) is in an open state, a first side end of the outer cover (1211) of the middle housing (121) abut against and support the first support plate (124), and a second side end of the outer cover (1211) of the middle housing (121) abut against and support the second support plate (125).

~~22~~5. The folding mechanism (12) according to any one of claims 1 to 3 ~~21~~, wherein when the folding mechanism (12) is in ~~the~~ an open state, the first support plate (124) is spliced with the second support plate (125).

~~23~~6. The folding mechanism (12) according to any one of claims ~~20~~ 1 to ~~22~~5, wherein the

first support plate (124) comprises a first plate body (1242), a first rotation part (1243), and a second rotation part (1244), the first rotation part (1243) and the second rotation part (1244) are fastened on the first plate body (1242) in a mutually spaced manner, the first rotation part (1243) is rotatably connected to the first fixing bracket (122), and the second rotation part (1244) is rotatably connected to the middle housing (121);

the second support plate (125) comprises a second plate body (1252), a third rotation part (1253), and a fourth rotation part (1254), the third rotation part (1253) and the fourth rotation part (1254) are fastened on the second plate body (1252) in a mutually spaced manner, the third rotation part (1253) is rotatably connected to the second fixing bracket (123), and the fourth rotation part (1254) is rotatably connected to the middle housing (121); and

when the folding mechanism (12) is in the open state, the second rotation part (1244) and the fourth rotation part (1254) are located between the first rotation part (1243) and the third rotation part (1253); ~~or~~and when the folding mechanism (12) is in the closed state, a spacing between the first rotation part (1243) and the third rotation part (1253) is less than a spacing between the second rotation part (1244) and the fourth rotation part (1254).

~~24~~7. The folding mechanism (12) according to claim ~~23~~6, wherein the folding mechanism further comprises a first hinge (1210a) and a second hinge (1210b), the first hinge (1210a) is inserted into the first rotation part (1243) and the first fixing bracket (122), and the second hinge (1210b) is inserted into the second rotation part (1244) and the middle housing (121); and

the folding mechanism further comprises a third hinge (1210c) and a fourth hinge (1210d), the third hinge (1210c) is inserted into the third rotation part (1253) and the second fixing bracket (123), and the fourth hinge (1210d) is inserted into the fourth rotation part (1254) and the middle housing (121).

~~25~~8. The folding mechanism (12) according to claim ~~24~~7, wherein the middle housing (121) comprises a first convex part (1211a) and a second convex part (1211b), the second hinge (1210b) is inserted into the first convex part (1211a), the first convex part (1211a) is embedded into the first support plate (124), the fourth hinge (1210d) is inserted into the second convex part (1211b), and the second convex part (1211b) is embedded into the second support plate (125).

~~26~~9. The folding mechanism (12) according to any one of claims ~~23~~ 6 to ~~25~~8, wherein the first plate body (1242) comprises a first body part (1242a) and a first extension part (1242b), the first extension part (1242b) is fastened to a side of the first body part (1242a) and protrudes relative to the first body part (1242a), a first notch (1242c) is formed on a side that is of the first body part (1242a) and that is away from the first extension part (1242b), the first rotation part (1243) is located in the first notch (1242c) and is fastened to the first body part (1242a), a second notch (1242d) is formed on a side that is of the first body part (1242a) and that is close to the first extension part (1242b), and the second rotation part (1244) is located in the second notch (1242d), and is fastened to the first body part (1242a);

the second plate body (1252) comprises a second body part (1252a) and a second extension part (1252b), the second extension part (1252b) is fastened to a side of the second body part (1252a) and protrudes relative to the second body part (1252a), a third notch (1252c) is formed on a side that is of the second body part (1252a) and that is away from the second extension part (1252b), the third rotation part (1253) is located in the third notch (1252c) and is fastened to the second body part (1252a), a fourth notch (1252d) is formed on a side that is of the second main part (1252a) and that is close to the second extension part (1252b), and the fourth rotation part (1254) is located in the fourth notch (1252d) and is fastened to the second body part (1252a); and

in a process of unfolding the folding mechanism (12), the first extension part (1242b) and the second extension part (1252b) are close to each other, and in a process of folding the folding mechanism (12), the first extension part (1242b) and the second extension part (1252b) are away from each other.

~~27~~10. The folding mechanism (12) according to any one of claims ~~20~~ 1 to 9~~26~~, wherein ~~the first swing arm (126) comprises a sliding end (1261) and a rotation end (1262),~~ the first fixing bracket (122) is provided with a first sliding slot (1225), the ~~sliding end (1261)~~first sliding end (1261) of the first swing arm (126) is mounted in the first sliding slot (1225), and the ~~rotation end (1262)~~first rotation end (1262) of the first swing arm (126) is rotatably connected to the middle housing (121); and

~~the second swing arm (127) comprises a sliding end (1271) and a rotation end (1272),~~ the second fixing bracket (123) is provided with a second sliding slot (1235), the ~~sliding end (1271)~~second sliding end (1271) of the second swing arm (127) is mounted in the second sliding

slot (1235), and the ~~rotation end (1272)~~second rotation end (1272) of the second swing arm (127) is rotatably connected to the middle housing (121).

~~28~~11. The folding mechanism (12) according to any one of claims 1 to ~~27~~10, wherein the folding mechanism further comprises a plurality of synchronous gears (1281), each of the synchronous gears (1281) is rotatably connected to the middle housing (121), the plurality of synchronous gears (1281) are engaged with each other, and the ~~rotation end (1262)~~first rotation end (1262) of the first swing arm (126) is engaged with the ~~rotation end (1272)~~second rotation end (1272) of the second swing arm (127) by using the plurality of synchronous gears (1281).

~~29~~12. The folding mechanism (12) according to claim ~~28~~11, wherein the ~~rotation end (1262)~~ first rotation end (1262) of the first swing arm (126), the plurality of synchronous gears (1281), and the ~~rotation end (1272)~~second rotation end (1272) of the second swing arm (127) are arranged in an arc shape.

~~30~~13. The folding mechanism (12) according to claim ~~28~~ 11 or ~~29~~12, wherein the folding mechanism further comprises a first blocker (1282) and a first elastic part (1285), the first blocker (1282) and the first elastic part (1285) are mounted in the middle housing (121), the first blocker (1282) is located between the first elastic part (1285) and the synchronous gear (1281), and when the first elastic part (1285) is in a compressed state, the first blocker (1282) abuts against the synchronous gear (1281) through an elastic force generated by the first elastic part (1285); and

when the folding mechanism (12) is in the open state, the first blocker (1282) and the synchronous gear (1281) form a first clamping structure; or when the folding mechanism (12) is in the closed state, the first blocker (1282) and the synchronous gear (1281) form a second clamping structure.

~~31. The folding mechanism (12) according to claim 30, wherein the folding mechanism further comprises a first rotatable connecting shaft (1286), a second rotatable connecting shaft (1287), a third rotatable connecting shaft (1288), a second blocker (1283), and a fastening plate (1284) that are mounted in the middle housing (121), the second blocker (1283) is located on a side that is of the synchronous gear (1281) and that is away from the first blocker (1282), the fastening plate (1284) is located on a side that is of the first elastic part (1285) and that is away~~

from the first blocker (1282), and the first elastic part (1285) comprises a plurality of springs (1285a);

the first rotatable connecting shaft (1286) is inserted into the second blocker (1283), the rotation end (1262) of the first swing arm (126), the first blocker (1282), one of the springs (1285a), and the fastening plate (1284), the third rotatable connecting shaft (1288) is inserted into the second blocker (1283), the synchronous gear (1281), the first blocker (1282), another spring (1285a), and the fastening plate (1284), and the second rotatable connecting shaft (1287) is inserted into the second blocker (1283), the rotation end (1272) of the second swing arm (127), the first blocker (1282), the another spring (1285a), and the fastening plate (1284);

the first blocker (1282) comprises a plurality of first bump groups (1282b), each of the first bump groups (1282b) comprises a plurality of first bumps (1282d), the plurality of first bumps (1282d) are arranged in a ring shape and are spaced from each other, the second blocker (1283) comprises a plurality of second bump groups (1283b), each of the second bump groups (1283b) comprises a plurality of second bumps (1283d), and the plurality of second bumps (1283d) are arranged in a ring shape and are spaced from each other; the rotation end (1262) of the first swing arm (126), the synchronous gear (1281), and the rotation end (1272) of the second swing arm (127) each comprise a plurality of first protrusions and a plurality of second protrusions that are disposed back to each other, the plurality of first protrusions are arranged in a ring shape and are spaced from each other, and the plurality of second protrusions are arranged in a ring shape and are spaced from each other; and

a plurality of first protrusions (1262b) of the first swing arm (126) and a plurality of first bumps (1282d) of one of the first bump groups (1282b) are alternately arranged to form a clamping structure, and a plurality of second protrusions (1262c) of the first swing arm (126) and a plurality of second bumps (1283d) of one of the second bump groups (1283b) are alternately arranged to form a clamping structure; a plurality of first protrusions (1281b) of the synchronous gear (1281) and a plurality of first bumps (1282d) of another first bump group (1282b) are alternately arranged to form a clamping structure, and a plurality of second protrusions (1281c) of the synchronous gear (1281) and a plurality of second bumps (1283d) of another second bump group (1283b) are alternately arranged to form a clamping structure; and a plurality of first protrusions (1272b) of the second swing arm (127) and a plurality of first bumps (1282d) of another first bump group (1282b) are alternately arranged to form a clamping structure, and a plurality of second protrusions

(1272c) of the second swing arm (127) and a plurality of second bumps (1283d) of another second bump group (1283b) are alternately arranged to form a clamping structure.

32. The folding mechanism (12) according to any one of claims 27 to 31, wherein the first fixing bracket (122) is further provided with a first mounting groove (1226), the first mounting groove (1226) communicates with the first sliding slot (1225), the folding mechanism (12) further comprises a first stopper (129), the first stopper (129) is mounted in the first mounting groove (1226), and when the folding mechanism (12) is in the open state, the first stopper (129) abuts against the sliding end (1261) of the first swing arm (126).

33. The folding mechanism (12) according to claim 32, wherein the first stopper (129) comprises a holder (1291) and a second elastic part (1292), the holder (1291) comprises a control part (1291a) and a pressing part (1291b), one end of the second elastic part (1292) is mounted on the control part (1291a) of the holder (1291), the other end of the second elastic part (1292) abuts against a groove wall of the first mounting groove (1226), and when the folding mechanism (12) is in the open state, the pressing part (1291b) of the holder (1291) abuts against the sliding end (1261) of the first swing arm (126).

34. The folding mechanism (12) according to any one of claims 27 to 33, wherein the first fixing bracket (122) comprises a top surface (1221), a bottom surface (1222), and a second side surface (1224), the top surface (1221) and the bottom surface (1222) are disposed back to each other, the second side surface (1224) is located between the top surface (1221) and the bottom surface (1222), the top surface (1221) faces the first support plate (124), the second side surface (1224) faces the middle housing (121), and the top surface (1221) and the bottom surface (1222) are close to each other in a direction close to the second side surface (1224).

35. The folding mechanism (12) according to claim 34, wherein in the direction close to the second side surface (1224), an extension direction of the first sliding slot (1225) and the bottom surface (1222) are away from each other.

36. A folding mechanism (52), comprising a middle housing (521), a first fixing bracket (522), a second fixing bracket (523), a first support plate (524), and a second support plate (525), wherein the first fixing bracket (522) is rotatably connected to the middle housing (521), and the second fixing bracket (523) is rotatably connected to the middle housing (521); the first support plate (524) is slidably connected to the first fixing bracket (522), and is rotatably connected to the middle housing (521); and the second support plate (525) is slidably connected to the second fixing bracket

(523), and is rotatably connected to the middle housing (521); and

when the folding mechanism (52) is in an open state, a support surface (5241) of the first support plate (524) is flush with a support surface (5251) of the second support plate (525); or when the folding mechanism (52) is in a closed state, a support surface (5241) of the first support plate (524) and a support surface (5251) of the second support plate (525) are disposed opposite to each other, and are away from each other in a direction close to the middle housing (521).

37. The folding mechanism (52) according to claim 36, wherein the middle housing (521) is provided with inner space (5213); and

when the folding mechanism (52) is in the open state, the first support plate (524) covers a part of the inner space (5213), and the second support plate (525) covers a part of the inner space (5213); or

when the folding mechanism (52) is in the closed state, the first support plate (524) partially extends into the inner space (5213), and the second support plate (525) partially extends into the inner space (5213).

38. The folding mechanism (52) according to claim 37, wherein when the folding mechanism (52) is in the open state, the first support plate (524) is spliced with the second support plate (525).

39. The folding mechanism (52) according to any one of claims 36 to 38, wherein the first fixing bracket (522) comprises a first arc-shaped arm (522b), the second fixing bracket (523) comprises a second arc-shaped arm (523b), the middle housing (521) is provided with a first arc-shaped groove (5213a) and a second arc-shaped groove (5213b), the first arc-shaped arm (522b) is mounted in the first arc-shaped groove (5213a), and the second arc-shaped arm (523b) is mounted in the second arc-shaped groove (5213b).

40. The folding mechanism (52) according to any one of claims 36 to 39, wherein the first support plate (524) is further rotatably connected to the first fixing bracket (522), and the second support plate (525) is further rotatably connected to the second fixing bracket (523).

41. The folding mechanism (52) according to any one of claims 36 to 39, wherein the first support plate (524) comprises a first plate body (5242), a first movable part (5243), and a first rotation part (5244), the support surface (5241) of the first support plate (524) is formed on the first plate body (5242), the first movable part (5243) and the first rotation part (5244) are fastened on the first plate body (5242), the first movable part (5243) is slidably connected to the first fixing bracket (522), and the first rotation part (5244) is rotatably connected to the middle housing (521);

and

the second support plate (525) comprises a second plate body (5252), a second movable part (5253), and a second rotation part (5254), the support surface (5251) of the second support plate (525) is formed on the second plate body (5252), the second movable part (5253) and the second rotation part (5254) are fastened on the second plate body (5252), the second movable part (5253) is slidably connected to the second fixing bracket (523), and the second rotation part (5254) is rotatably connected to the middle housing (521).

42. The folding mechanism (52) according to claim 41, wherein the first plate body (5242) is provided with a fixing surface (5245) and a first avoidance notch (5246), the fixing surface (5245) of the first plate body (5242) is disposed back to the support surface (5241) of the first support plate (524), the first rotation part (5244) is an arc-shaped arm, one end of the first rotation part (5244) is fastened to the fixing surface (5245) of the first plate body (5242), and the other end of the first rotation part (5244) is located in the first avoidance notch (5246);

the second plate body (5252) is provided with a fixing surface (5255) and a second avoidance notch (5256), the fixing surface (5255) of the second plate body (5252) is disposed back to the support surface (5251) of the second support plate (525), the second rotation part (5254) is an arc-shaped arm, one end of the second rotation part (5254) is fastened to the fixing surface (5255) of the second plate body (5252), and the other end of the second rotation part (5254) is located in the second avoidance notch (5256); and

the middle housing (521) is provided with a third arc-shaped groove (5212c) and a fourth arc-shaped groove (5212d), the first rotation part (5244) is mounted in the third arc-shaped groove (5212c), and the second rotation part (5254) is mounted in the fourth arc-shaped groove (5212d).

43. The folding mechanism (52) according to claim 42, wherein the first movable part (5243) is further rotatably connected to the first fixing bracket (522), and the second movable part (5253) is further rotatably connected to the second fixing bracket (523).

44. The folding mechanism (52) according to claim 43, wherein the first fixing bracket (522) is provided with a first sliding slot (5225), the first movable part (5243) comprises a hinge (5243b), and the hinge (5243b) of the first movable part (5243) is mounted in the first sliding slot (5225), and can slide in the first sliding slot (5225); the second fixing bracket (523) is provided with a second sliding slot (5235), the second movable part (5253) comprises a hinge (5253b), and the hinge (5253b) of the second movable part (5253) is mounted in the second sliding slot (5235), and

can slide in the second sliding slot (5235).

45. The folding mechanism (52) according to claim 44, wherein when the folding mechanism (52) is in the closed state, in the direction close to the middle housing (521), an extension direction of the first sliding slot (5225) and an extension direction of the second sliding slot (5235) are away from each other.

46. The folding mechanism (52) according to claim 45, wherein the hinge (5243b) of the first movable part (5243) can further rotate in the first sliding slot (5225), and the hinge (5253b) of the second movable part (5253) can further rotate in the second sliding slot (5235).

47. The folding mechanism (52) according to any one of claims 36 to 46, wherein the folding mechanism (52) further comprises a third fixing bracket (5261), a fourth fixing bracket (5262), a first swing arm (527), a second swing arm (528), and a plurality of synchronous gears (5291), wherein the first swing arm (527) comprises a movable end (5271) and a rotation end (5272), the movable end (5271) of the first swing arm (527) is slidably connected to the third fixing bracket (5261), and the rotation end (5272) of the first swing arm (527) is rotatably connected to the middle housing (521); the second swing arm (528) comprises a movable end (5281) and a rotation end (5282), the movable end (5281) of the second swing arm (528) is slidably connected to the fourth fixing bracket (5262), and the rotation end (5282) of the second swing arm (528) is rotatably connected to the middle housing (521); and each of the synchronous gears (5291) is rotatably connected to the middle housing (521), two adjacent synchronous gears (5291) are engaged with each other, and the rotation end (5272) of the first swing arm (527) is engaged with the rotation end (5282) of the second swing arm (528) by using the plurality of synchronous gears (5291).

48. The folding mechanism (52) according to claim 47, wherein the movable end (5271) of the first swing arm (527) is further rotatably connected to the third fixing bracket (5261), and the movable end (5281) of the second swing arm (528) is further rotatably connected to the fourth fixing bracket (5262).

49. The folding mechanism (52) according to claim 48, wherein the movable end (5271) of the first swing arm (527) comprises a hinge (5271a), the third fixing bracket (5261) is provided with a third sliding slot (5261e), and the hinge (5271a) of the movable end (5271) of the first swing arm (527) is mounted in the third sliding slot (5261e), and can slide in the third sliding slot (5261e); and the movable end (5281) of the second swing arm (528) comprises a hinge (5281a), the fourth fixing bracket (5262) is provided with a fourth sliding slot (5262e), and the hinge (5281a) of the

movable end (5281) of the second swing arm (528) is mounted in the fourth sliding slot (5262e), and can slide in the fourth sliding slot (5262e).

50. The folding mechanism (52) according to claim 49, wherein the rotation end (5272) of the first swing arm (527), the plurality of synchronous gears (5291), and the rotation end (5282) of the second swing arm (528) are arranged in an arc shape.

51. The folding mechanism (52) according to any one of claims 47 to 50, wherein the folding mechanism (52) further comprises a first blocker (5292) and an elastic part (5295), the first blocker (5292) and the elastic part (5295) are mounted in the middle housing (521), the first blocker (5292) is located between the elastic part (5295) and the synchronous gear (5291), and when the elastic part (5295) is in a compressed state, the first blocker (5292) abuts against the synchronous gear (5291) through an elastic force generated by the elastic part (5295); and

when the folding mechanism (52) is in the open state, the first blocker (5292) and the synchronous gear (5291) form a first clamping structure; or when the folding mechanism (52) is in the closed state, the first blocker (5292) and the synchronous gear (5291) form a second clamping structure.

52. The folding mechanism (52) according to claim 51, wherein the folding mechanism (52) further comprises a first rotatable connecting shaft (5296), a second rotatable connecting shaft (5297), a third rotatable connecting shaft (5298), a second blocker (5293), and a fastening plate (5294) that are mounted in the middle housing (521), the second blocker (5293) is located on a side that is of the synchronous gear (5291) and that is away from the first blocker (5292), the fastening plate (5294) is located on a side that is of the elastic part (5295) and that is away from the first blocker (5292), and the elastic part (5295) comprises a plurality of springs (5295a);

the first rotatable connecting shaft (5296) is inserted into the second blocker (5293), the rotation end (5272) of the first swing arm (527), the first blocker (5292), one of the springs (5295a), and the fastening plate (5294), the third rotatable connecting shaft (5298) is inserted into the second blocker (5293), the synchronous gear (5291), the first blocker (5292), another spring (5295a), and the fastening plate (5294), and the second rotatable connecting shaft (5297) is inserted into the second blocker (5293), the rotation end (5282) of the second swing arm (528), the first blocker (5292), the another spring (5295a), and the fastening plate (5294);

the first blocker (5292) comprises a plurality of first bump groups (5292b), each of the first bump groups (5292b) comprises a plurality of first bumps (5292d), the plurality of first bumps

(5292d) are arranged in a ring shape and are spaced from each other, the second blocker (5293) comprises a plurality of second bump groups (5293b), each of the second bump groups (5293b) comprises a plurality of second bumps (5293d), and the plurality of second bumps (5293d) are arranged in a ring shape and are spaced from each other; the rotation end (5272) of the first swing arm (527) comprises a plurality of first protrusions (5272b) and a plurality of second protrusions (5272c) that are disposed back to each other, the plurality of first protrusions (5272b) are arranged in a ring shape and are spaced from each other, and the plurality of second protrusions (5272c) are arranged in a ring shape and are spaced from each other; the synchronous gear (5291) comprises a plurality of first protrusions (5291b) and a plurality of second protrusions (5291c) that are disposed back to each other, the plurality of first protrusions (5291b) are arranged in a ring shape and are spaced from each other, and the plurality of second protrusions (5291c) are arranged in a ring shape and are spaced from each other; and the rotation end (5282) of the second swing arm (528) comprises a plurality of first protrusions (5282b) and a plurality of second protrusions (5282c) that are disposed back to each other, the plurality of first protrusions (5282b) are arranged in a ring shape and are spaced from each other, and the plurality of second protrusions (5282c) are arranged in a ring shape and are spaced from each other; and

the plurality of first protrusions (5272b) of the first swing arm (527) and the plurality of first bumps (5292d) of one of the first bump groups (5292b) are alternately arranged to form a clamping structure, and the plurality of second protrusions (5272c) of the first swing arm (527) and the plurality of second bumps (5293d) of one of the second bump groups (5293b) are alternately arranged to form a clamping structure; the plurality of first protrusions (5291b) of the synchronous gear (5291) and the plurality of first bumps (5292d) of another first bump group (5292b) are alternately arranged to form a clamping structure, and the plurality of second protrusions (5291c) of the synchronous gear (5291) and the plurality of second bumps (5293d) of another second bump group (5293b) are alternately arranged to form a clamping structure; and the plurality of first protrusions (5282b) of the second swing arm (528) and the plurality of first bumps (5292d) of another first bump group (5292b) are alternately arranged to form a clamping structure, and the plurality of second protrusions (5282c) of the second swing arm (528) and the plurality of second bumps (5293d) of another second bump group (5293b) are alternately arranged to form a clamping structure.

53. A housing apparatus, comprising a first housing, a second housing, and the folding

~~mechanism according to any one of claims 1 to 52, wherein the folding mechanism connects the first housing and the second housing, and the folding mechanism is configured to enable the first housing and the second housing to be folded or unfolded relative to each other.~~

~~54~~14. An electronic device, comprising ~~a flexible display,~~ a first housing, a second housing, and the folding mechanism according to any one of claims 1 to ~~52~~13, wherein the first fixing bracket (122) is fastened to ~~the folding mechanism connects~~ the first housing, and the second fixing bracket (123) is fastened to the second housing.

~~, and the folding mechanism is configured to enable the first housing and the second housing to be folded or unfolded relative to each other; and~~

15. The electronic device according to claim 14, further comprising a ~~the~~ flexible display, wherein the flexible display comprises a first non-bending portion, a bending portion, and a second non-bending portion that are sequentially arranged, wherein the first non-bending portion is fixedly connected to the first housing, the second non-bending portion is fixedly connected to the second housing, and the bending portion deforms in a process in which the first housing and the second housing are folded or unfolded relative to each other.

~~55. The electronic device according to claim 54, wherein a first fastening groove is disposed on a side that is of the first housing and that is close to the folding mechanism, a first fixing bracket of the folding mechanism is mounted in the first fastening groove, a second fastening groove is disposed on a side that is of the second housing and that is close to the folding mechanism, a second fixing bracket of the folding mechanism is mounted in the second fastening groove, and the middle housing comprises an appearance surface; and~~

~~when the first housing and the second housing are unfolded relative to each other to an open state, the first housing and the second housing cover the appearance surface; or when the first housing and the second housing are folded relative to each other to a closed state, the appearance surface is exposed relative to the first housing and the second housing.~~

~~56. The electronic device according to claim 55, wherein the appearance surface comprises a first arc surface part, a planar part, and a second arc surface part, and the first arc surface part and the second arc surface part are respectively connected to two sides of the planar part; or the appearance surface is an arc surface.~~