and second leaves 21, 22 are held relative to each other when an angle formed between the first and second leaves 21, 22 reaches a predetermined value or range, or may be configured such that the second action unit 7 retards the relative rotation between the first and second leaves 21, 22 when the angle formed between the first and second leaves 21, 22 reaches a predetermined value or range, and is not limited to such.

Referring to Figures 2 and 8, the ring unit 5 includes two ring members 51 and two spacer assemblies 52. The ring members 51 are respectively disposed between the first tubular member 61 and the second barrel 221 and between the second tubular member 71 and the second barrel 221. Each of the spacer assemblies 52 includes a spacer 521. Each of the spacers 521 of the spacer assemblies 52 has a surrounding wall 522 that is disposed between the second barrel 221 and a respective one of the first tubular member 61 and the second tubular member 71, and a flange wall 523 that is disposed between the second barrel 221 and a respective one of the first barrels 211. Each of the ring members 51 and the spacer assemblies 52 may be made of Polyoxymethylene (POM) or Polytetrafluoroethylene (PTFE), and serves as a bushing for facilitating relative rotation between the corresponding components.

During installation of the hinge onto the first and

along the axis (X).

Referring to Figures 26 and 27, when the first and second leaves 21, 22 are rotated relative to each other by an external force, the torsional axle 42 and the slide block 37 are rotated relative to each other, so that the inclined surface 335 of the adjusting member 33 pushes the inclined surface 372 of the slide block 37 to move the slide block 37 away from the adjusting member 33 along the axis (X) to compress the auxiliary spring 36 so as to generate a restoring force. When the external force is removed, the torsion spring 32 and the auxiliary spring 36 restore to rotate the first and second leaves 21, 22 relative to each other, and to move the slide block 37 toward the adjusting member 33 along the axis (X).

In summary, the advantages of the disclosure are as follows:

1. The torsional axle 42, the first axle 43 or the second axle 44 can be easily and co-rotatably mounted to the second barrel 221 of the second leaf 22 by virtue of the fixing member 41 that is removably mounted in the second barrel 221 without forming mounting structures on the inner surrounding surface of the second barrel 221. Moreover, a worn fixing member 41 can be easily substituted with a new fixing member 41.

2. Each of the ring members 51 and the spacer assemblies 52 serves as a bushing for facilitating

CLAIMS:

1. A hinge adapted to interconnect first and second objects comprising:

a leaf unit including first and second leaves that are rotatable relative to each other, said first leaf having at least one first barrel, said second leaf having at least one second barrel that is spaced apart from said first barrel along an axis;

two action units being inserted into said first barrel and said second barrel respectively in two opposite directions along the axis, and being co-rotatable with said first leaf; and

an axle unit including a fixing member that is mounted in said second barrel of said second leaf and that is co-rotatable with said second leaf, and two axles that are respectively associated with said action units and that are co-rotatably and separably mounted to said fixing member, each of said axles and said corresponding action unit being rotated relative to each other upon relative rotation between said first and second leaves so that said corresponding action unit generates an actuating force that acts between said first and second leaves.

2. The hinge as claimed in claim 1, wherein said first leaf further has a first clinging surface that clings to the first object, and a first positioning surface

that is parallel to the axis, that is connected to said first clinging surface and that is not coplanar with said first clinging surface, said first positioning surface permitting an edge of the first object to abut thereagainst.

3. The hinge as claimed in claim 1, wherein said second leaf further has a second clinging surface that clings to the second object, and a second positioning surface that is parallel to the axis, that is connected to said second clinging surface and that is not coplanar with said second clinging surface, said second positioning surface permitting an edge of the second object to abut thereagainst.

4. The hinge as claimed in claim 1, wherein said first leaf is U-shaped and defines a receiving space, said second leaf being disposed in said receiving space of said first leaf.

5. The hinge as claimed in claim 1, further comprising a ring unit, said ring unit including a plurality of ring members and a spacer assembly, said ring members being respectively disposed between one of said action units and said second barrel and between the other one of said action units and said second barrel, said spacer assembly including at least one spacer, said

spacer having a surrounding wall that is disposed between said second barrel and one of said action units, and a flange wall that is disposed between said first barrel and said second barrel.

6. The hinge as claimed in claim 5, wherein each of said first leaf, said second leaf and said spacer is made of metal, each of said ring members being made of Polyoxymethylene (POM) or Polytetrafluoroethylene (PTFE).

7. The hinge as claimed in claim 1, wherein one of said action units includes a tubular member that is inserted into said first and second barrels and that is co-rotatable with said first leaf, a disc spring assembly that is disposed in said tubular member, a friction member that abuts against said disc spring assembly and that is co-rotatable with said tubular member, and an adjusting member that engages threadably said tubular member and that pushes said disc spring assembly, said friction member having a friction surface that is in frictional contact with said corresponding axle, so that said action unit generates the actuating force that acts between said first and second leaves when said axle and said action unit are rotated relative to each other.

8. The hinge as claimed in claim 7, wherein said fixing member has a rectangular fixing hole that extends along the axis (X), and a fixing groove, said corresponding axle having two protrusions that protrude toward said friction surface of said friction member and that are in frictional contact with said friction surface, and a post that co-rotatably engages said fixing groove of said fixing member, the other one of said axles co-rotatably engaging said fixing hole of said fixing member.

9. The hinge as claimed in claim 7, wherein the other one of said action units includes a tubular member that is inserted into said first and second barrels and that is co-rotatable with said first leaf, a torsion spring that is disposed in said tubular member and that surrounds the other one of said axles, and an adjusting member that is rotatably disposed in said tubular member and that is able to be positioned relative to said tubular member, said torsion spring having two end portions that are respectively connected to said adjusting member and the other one of said axles.

10. The hinge as claimed in claim 7, wherein the other one of said action units includes a tubular member that is inserted into said first and second barrels and that is co-rotatable with said first leaf, a hydraulic

module that is disposed in said tubular member, a proximal acting member that is co-rotatably mounted in said tubular member, and a cap member that is mounted to an end of said tubular member, said hydraulic module including a hydraulic cylinder, an abutment pin that abuts against said hydraulic cylinder and the other one of said axles, and a resilient member that abuts against said hydraulic cylinder and the other one of said axles, said proximal acting member having a proximal inclined surface that faces away from said fixing member, and a through hole that permits the other one of said axles to extend therethrough, the other one of said axles further having an abutment surface that abuts against said abutment pin and said resilient member, and a proximal follower surface that is opposite to said abutment surface and that is in contact with said proximal inclined surface of said proximal acting member, the other one of said axles moving along the axis upon the relative rotation between said first and second leaves.

11. The hinge as claimed in claim 1, wherein one of said action units includes a tubular member that is inserted into said first and second barrels (211, 221) and that is co-rotatable with said first leaf, a hydraulic module that is disposed in said tubular member, a proximal acting member that is co-rotatably mounted in

said tubular member, and a cap member that is mounted to an end of said tubular member, said hydraulic module including a hydraulic cylinder, an abutment pin that abuts against said hydraulic cylinder and said corresponding axle, and a resilient member that abuts against said hydraulic cylinder and said corresponding axle, said proximal acting member having a proximal inclined surface that faces away from said fixing member, and a through hole that permits said corresponding axle to extend therethrough, said corresponding axle having an abutment surface that abuts against said abutment pin and said resilient member, and a proximal follower surface that is opposite to said abutment surface and that is in contact with said proximal inclined surface of said proximal acting member, said corresponding axle moving along the axis upon the relative rotation between said first and second leaves.

12. The hinge as claimed in claim 11, wherein the one of said action units further includes a distal acting member that is co-rotatably mounted in said tubular member, said corresponding axle further having a distal follower surface that is opposite to said proximal follower surface, said distal acting member being located between said hydraulic cylinder and said corresponding axle, and having a distal inclined

surface that is in contact with said distal follower surface of said said corresponding axle.

13. The hinge as claimed in claim 11, wherein said hydraulic cylinder threadably engages said tubular member, and has a hexagonal setting hole that extend along the axis and that is accessible through said cap member, and a hexagonal throttle hole, said hexagonal setting hole of said hydraulic cylinder permitting a hand tool to engage therewith for adjusting the relative position between said hydraulic cylinder and said tubular member, said hexagonal throttle hole permitting another hand tool to engage therewith for adjusting the damping coefficient of said hydraulic cylinder.

14. The hinge as claimed in claim 11, wherein the other one of said action units includes a tubular member that is inserted into said first and second barrels and that is co-rotatable with said first leaf, a torsion spring that is disposed in said tubular member and that surrounds the other one of said axles, and an adjusting member that is rotatably disposed in said tubular member and that is able to be positioned relative to said tubular member, said torsion spring having two end portions that are respectively connected to said adjusting member and the other one of said axles.

15. The hinge as claimed in claim 1, wherein each of said action units includes a tubular member that is inserted into said first and second barrels and that is co-rotatable with said first leaf, a torsion spring that is disposed in said tubular member and that surrounds said corresponding axle, and an adjusting member that is rotatably disposed in said tubular member and that is able to be positioned relative to said tubular member, said torsion spring of each of said action units having two end portions that are respectively connected to said adjusting member of said action unit and said corresponding axle.

16. The hinge as claimed in claim 15, wherein said torsion spring of at least one said action units has a middle coil, two end coils that are respectively connected to two opposite ends of said middle coil, and two end portions (321, 322) that are respectively connected to said end coils and that are respectively connected to said adjusting member and said corresponding axle, each of said end coils having at least two spirals that are spaced apart from each other by a first distance, said middle coil having a plurality of spirals, two adjacent ones of said spirals of said middle coil being spaced apart from each other by a second distance, the first distance being smaller than

the second distance.

17. The hinge as claimed in claim 15, wherein at least one of said action unit further includes an auxiliary spring and a slide block, said axle that corresponds to the one of said action unit having a rectangular auxiliary axle portion, said adjusting member of the one of said action unit further having an inclined surface, said auxiliary spring being sleeved on said corresponding axle and surrounded by said torsion spring of the one of said action unit, said slide block abutting against an end of said auxiliary spring, and having a rectangular hole that is engaged with said auxiliary axle portion of said corresponding axle, and an inclined surface that faces said inclined surface of said adjusting member, said slide block being co-rotatable with said corresponding axle, and being movable along said auxiliary axle portion of said corresponding axle along the axis.

18. The hinge as claimed in claim 15, wherein said fixing member has a rectangular fixing hole and a fixing recess that are respectively formed in two opposite end surfaces of said fixing member along the axis, each of said axles having an axle portion, said axle portions of said axles respectively engaging said fixing hole and said fixing recess of said fixing member.

19. The hinge as claimed in claim 18, wherein said fixing member further has two fixing grooves that are respectively formed in said opposite end surfaces thereof, each of said axles further having a flange portion that is formed with a breach, said breaches of said axles being respectively aligned with said fixing grooves of said fixing member, so that one of said end portions of said torsion spring of each of said action units extending through said breach of said corresponding axle to engage said corresponding fixing groove of said fixing member.

20. The hinge as claimed in claim 1, wherein said first barrel has two inner limiting planes that are formed on an inner surrounding surface thereof, each of said action units including a tubular member that is inserted into said first and second barrels and that is co-rotatable with said first leaf, said tubular member of each of said action units having two outer limiting planes that are formed at an outer surrounding surface thereof and that respectively abut against said inner limiting planes of said first barrel.

21. The hinge as claimed in claim 20, wherein said tubular member of at least one of said action units includes a first tube section, and a second tube section

that abuts against said first tube section, a junction between said first tube section and said second tube section being located within said first barrel.

22. The hinge as claimed in claim 1, wherein said fixing member is removably mounted in said second barrel of said second leaf.