CLAIMS

1. A bracket comprising:

a first support member having a first connecting portion and a first coupled end, the first connecting portion being spaced apart from the first coupled end;

a second support member having a second connecting portion and a second coupled end, the second connecting portion being spaced apart from the second coupled end, the second coupled end and the first coupled end being hingedly coupled together and rotatable relative to one another about a hinge joint, the first support member and the second support member being parallel to a support plane;

a first receiver rod, the first receiver rod extending from the first connecting portion, the first receiver rod extending along a receiving direction that is non-parallel to the support plane;

a second receiver rod, the second receiver rod extending from the second connecting portion; and

a first holder rod, the first holder rod extending from the first connecting portion parallel to the first receiver rod, wherein the first holder rod is spaced apart from the first receiver rod to define a first ring slot.

2. The bracket according to claim 1, further comprising:

a second holder rod, the second holder rod extending from the second connecting portion parallel to the second receiver rod, wherein the second holder rod is spaced apart from the second receiver rod to define a second ring slot.

3. The bracket according to claim 1 or claim 2, wherein the second receiver rod is parallel to the first receiver rod.

4. The bracket according to any one of claims 1 to 3, wherein the first receiver rod is normal to the support plane.

5. The bracket according to claim 2, further comprising a holder, the holder defining two or more limiter slots, wherein each of the first holder rod and the second holder rod is slidably engaged with a respective one of the two or more limiter slots to limit an angular displacement defined betwen the first support member and the second support member.

6. The bracket according to any one of claims 1 to 5, further comprising:

a first catcher rod coupled to the first support member and extending parallel to the first receiver rod; and

a first catch slidably engaged to the first catcher rod, wherein the first catch is releasably engageable with the first receiver rod.

7. The bracket according to claim 6, wherein an engagement between the first catch and the first receiver rod comprises a first hook, the first hook being rotationally coupled to the first catcher rod and releasable from the first receiver rod.

8. The bracket according to claim 6 or claim 7, further comprising:

a second catcher rod coupled to the second support member and extending parallel to the second receiver rod; and

a second catch slidably engaged to the second catcher rod, wherein the second catch is releasably engageable with the second receiver rod.

9. The bracket according to claim 8, wherein an engagement between the second catch and the second receiver rod comprises a second hook, the second hook being rotationally coupled to the second catcher rod and releasable from the second receiver rod.

10. A bracket in use with one or more ring surgical instruments, each of the one or more ring instruments being a first class lever formed by two shafts cooperatively forming a functional tip, the two shafts including two ring sections, the bracket comprising:

a first support member having a first connecting portion and a first coupled end, the first connecting portion being spaced apart from the first coupled end;

a second support member having a second connecting portion and a second coupled end, the second connecting portion being spaced apart from the second coupled end, the second coupled end and the first coupled end being hingedly coupled together and rotatable relative to one another about a hinge joint, the first support member and the second support member being parallel to a support plane;

a first receiver rod, the first receiver rod extending from the first connecting portion, the first receiver rod extending along a receiving direction that is non-parallel to the support plane;

a second receiver rod, the second receiver rod extending from the second connecting portion, wherein the first receiving rod and the second receiving rod are in slidable engagement with respective ones of the two ring sections of any one or more of the ring instruments; and

a first holder rod, the first holder rod extending from the first connecting portion parallel to the first receiver rod, wherein the first holder rod is spaced apart from the first receiver rod to define a first ring slot, and wherein the first ring slot is sized to receive one of the two ring sections.

11. The bracket according to claim 10, further comprising:

a second holder rod, the second holder rod extending from the second connecting portion parallel to the second receiver rod, wherein the second holder rod is spaced apart from the second receiver rod to define a second ring slot, and wherein the second ring slot is sized to receive another of the two ring sections.

12. The bracket according to claim 11, further comprising a holder, the holder defining two or more limiter slots, wherein each of the first holder rod and the second holder rod is in slidable engagement with a respective one of the two or more limiter slots, and wherein the slidable engagement limits an angle defined between the first support member and the second support member.

13. The bracket according to claim 11, wherein the two or more limiter slots define a minimum value and a maximum value for the angle.

14. The bracket according to claim 12 or claim 13, further comprising:

a first catcher rod coupled to the first support member and extending parallel to the first receiver rod; and

a first catch slidably engaged to the first catcher rod, wherein the first catch is releasably engageable with the first receiver rod to prevent any of the one or more ring instruments from sliding off the first receiver rod.

15. The bracket according to claim 14, wherein the first catch releasably closes the first ring slot to retain the respective first ring sections of the one or more ring instruments in the first ring slot.

16. The bracket according to claim 12 or claim 13, further comprising a gripping member pivotably coupled to the first holder member, the gripping member includes a hook to releasably hook the first holder member, wherein the gripping member includes a transversely extending tab to enable gripping by an end-effector.

17. The bracket according to claim 12 or claim 13, wherein responsive to the first support member pivoting relative to the second support member, the one or more ring instruments received by the first ring slot and the second ring slot are collectively alterable between an opened state and a closed state.

18. The bracket according to any one of claims 12 to 17, wherein a plurality of the ring instruments of various dimensions are receivable by the first ring slot and the second ring slot and held in a common orientation.

19. A system comprising:

a ring instrument inspection station configured to inspect a plurality of ring instruments, each of the plurality of ring instruments being a first class lever

formed by two shafts, each of the two shafts having a functional tip and ring section at either end; and

a first robotic arm configured to transfer a plurality of ring instruments to and from the ring instrument inspection station by transporting a bracket according to any one of claims 1 to 18 with the plurality of ring instruments assembled thereto.

20. The system according to claim 19, comprising:

a second robotic arm, the second robotic arm being configured to:

disengage each of the plurality of ring instruments from the bracket in turn to undergo non-ring inspection; and

bring each of the plurality of ring instruments into engagement with the bracket to assemble the plurality of ring instruments in a predefined order.

21. The system according to claim 19 or claim 20, wherein the ring instrument inspection station is configured to perform any one or more of the following: an optical inspection for any defect; a cutting test to test a sharpness of the functional tip; replacement of each rejected one of the plurality of ring instruments, and lubricate the box mechanism.

22. The system according to any one of claims 19 to 21, further comprising:

a loading station configured to receive one or more sets of instruments prior to processing by the system, each of the sets of instruments including: the plurality of ring instruments assembled to the bracket; and

an unloading station configured to hold the one or more sets of reassembled instruments after the processing by the system.

23. The system according to claim 22, comprising: a non-ring instrument inspection station configured to inspect the plurality of non-ring instruments, wherein each of the one or more sets of instruments further includes a plurality of non-ring instruments.

24. The system according to claim 22 or 23, wherein the non-ring instrument inspection station is configured to inspect each of the plurality of non-ring instruments in turn for any defect, and wherein the non-ring instrument inspection station further comprises: a conveyor module; replacement of each rejected one of the plurality of non-ring instruments, and a flipping module configured to change an orientation of each of the plurality of non-ring instruments.

25. The system according to any one of claims 19 to claim 24, further comprising an optical system and a controller for determining a respective position and a respective orientation of each of the plurality of ring instruments and each of the plurality of non-ring instruments.

26. The system according to claim 25, further comprising: a wrapping station configured to wrap selected ones of the plurality of non-ring instruments in a wrapper.

27. The system according to any one of claims as recited in any of claims 19 to 26, further comprising at least one spare instruments station for holding a plurality of spare ring instruments and/or a plurality of spare non-ring instruments.

28. A method of inspection, comprising:

using a first robotic arm to perform transferring of a plurality of ring instruments together before and/or after a ring instrument inspection, the first robotic arm being controllably operable to pick up and transfer the bracket of any one of claims 10 to 18;

disengaging each one of the plurality of ring instruments in turn from the bracket before the ring instrument inspection;

performing the ring instrument inspection of the plurality of ring instruments one ring instrument at a time in turn, with the one ring instrument disengaged from the bracket; and

assembling the bracket with a predefined number of predefined types of the ring instruments in a predefined order.

29. The method of inspection according to claim 28 further comprising any one or more of the following: (i) performing a non-ring inspection of a plurality of non-ring instruments and (ii) a wrapping of selected ones of the plurality of non-ring instruments.