CLAIMS:

1. A method for automatically threading wire in a wire bonding apparatus, comprising the steps of:

extending a wire tail of a wire from a wire spool and locating the wire tail in a wire locating device;

positioning the wire tail at a straightening location of the wire locating device;

gripping the wire tail at the straightening location with a wire manipulating device, straightening the wire tail at the straightening location with ~~a~~ the wire manipulating device and conveying the straightened wire tail to a threading location with the wire manipulating device; and

with a wire threading device, receiving the straightened wire tail at the threading location and threading the straightened wire tail through a capillary of the wire bonding apparatus.

2. The method of claim 1, wherein the wire locating device defines a positioning aperture shaped to receive and guide the wire tail to the wire straightening location.

3. The method of claim 2, wherein the positioning aperture is defined by a pair of converging opposing faces which converge at a positioning face at the straightening location.

4. The method of claim 3, wherein the positioning face extends along a vertical direction to orientate the wire tail along the vertical direction.

5. The method of claim 3, wherein the step of positioning the wire tail at the straightening location further comprises urging the wire tail which extends through the positioning aperture towards the positioning face with a wire tail urging device incorporated in the wire locating device.

6. The method of claim 5, wherein the wire tail urging device comprises an airflow generator which generates an airflow to urge the wire tail extending through the positioning aperture towards the positioning face.

7. The method of claim 6, wherein the airflow generator further retains the wire tail extending through the positioning aperture against the positioning face.

8. The method of claim 1, wherein the wire manipulating device comprises a first and second pairs of wire holders next to the straightening location,

wherein the step of gripping the wire tail with the wire manipulating device comprises: ~~straightening the wire tail at the straightening location comprises~~ gripping the wire tail with ~~respective~~ the first and second pairs of wire holders next to the straightening location.

9. The method of claim 8, wherein the step of straightening the wire tail further comprises the step of moving at least one of the first and second pair of wire holders away from the other while gripping the wire tail to straighten at least a portion of the wire tail.

10. The method of claim 8, further comprising the step of cutting excess wire from a free end of the wire tail to leave the straightened wire tail.

11. The method of claim 8, wherein the step of receiving the straightened wire tail at the threading location further comprises pulling the straightened wire tail to the threading location with at least one of the first and second pair of wire holders.

12. The method of claim 1, further comprising the step of inducing a tension in the wire via an air tensioner while pulling the straightened wire tail to the threading location.

13. The method of claim 1, wherein the step of threading the straightened wire tail through the capillary further comprises the step of moving the wire threading device from a parked position to the threading location which is aligned with the capillary.

14. The method of claim 1, further comprising the step of guiding the straightened wire tail with at least one wire guide comprised in the wire threading device towards the capillary.

15. The method of claim 14, wherein the at least one wire guide comprises a slotted guiding channel having an elongate slot extending along its axial length aligned with ~~the~~ an air tensioner and the capillary.

16. The method of claim 15, wherein the wire guide comprises a slot restrictor operative in use to close the slot.

17. The method of claim 16, wherein the slot restrictor comprises a flexible cover operative in use to move between a closed and an open position to close and open the slot.

18. The method of claim 17, further comprising the step of generating an airflow within the wire guide to move the flexible cover between the closed and open positions.

19. The method of claim 16, wherein the slot restrictor comprises a spring coupling a first half of the wire guide with a second half of the wire guide and operative in use to move between a closed and an open position to close and open the slot.

20. The method of claim 1, further comprising the step of obtaining information regarding a location of the wire guide with respect to the capillary by imaging a positioning identifier coupled to the wire threading device.

21. The method of claim 20, wherein the positioning identifier comprises a visual index operative in use to be imaged by a wire bonding imaging device.

22. The method of claim 1, further comprising the step of aligning the wire guide with the capillary by positioning the wire guide with a motion table and controller.

23. A wire bonding threading apparatus configured to perform the method according to claim 1.

24. A system for automatically threading wire in a wire bonding apparatus, the system comprising:

a wire locating device configured to receive a wire tail of a wire extended from a wire spool and position the wire tail at a straightening location of the wire locating device;

a wire manipulating device configured and operative to grip the wire tail at the straightening location, to straighten the wire tail at the straightening location and to convey the straightened wire tail to a threading location; and

a wire threading device configured to receive the straightened wire tail at the threading location and to thread the straightened wire tail through a capillary of the wire bonding apparatus.