CLAIMS

1. A ~~biopsy and therapy device~~rotary head mountable to a linkage for moving said rotary head, the rotary head comprising:

~~an imaging module comprising an ultrasound probe and an actuator for moving the probe in a reciprocal action;~~

a first arcuate slide;

a second arcuate slide in ~~sliding~~ engagement with the first arcuate slide ~~and a linkage to which the first arcuate slide is mounted~~;

~~said linkage arranged to move the first and second arcuate slides within a vertical plane~~;

a needling unit for holding and inserting a biopsy needle;

said needling unit mounted to said second arcuate slide wherein the first and second arcuate slides are mounted perpendicular to each other so as to rotate the needling unit about respective first and second principal axes;

wherein the first and second arcuate slides are concentric about a pivot point.

~~2. The biopsy and therapy device according to claim 1 wherein the first and second arcuate slides are concentric about a pivot point.~~

~~3.~~2. The ~~biopsy and therapy device~~rotary head according to claim ~~2~~ 1 wherein~~,~~ said rotary head arranged to be moved such that said pivot point is located at a contact point of the needling unit.

~~4. The biopsy and therapy device according to any one of claims 1 to 3, wherein each arcuate slide comprises a pair of radial sliding bearings.~~

~~5. The biopsy and therapy device according to any one of claims 1 to 4, wherein the first and second arcuate slides form part of a rotary head.~~

~~6.~~3. The rotary head ~~biopsy and therapy device~~ rotary head according to ~~any one of claims 1 to 5~~ claim 1 or 2, wherein the needling unit includes a needle holder for holding a needle guide during insertion, said holder including a recess for receiving a needle in a direction transverse to the direction of insertion.

~~7.~~4. The ~~biopsy and therapy device~~ rotary head according to any one of claims 1 to ~~5~~3, wherein said needling unit includes a needle stopper arranged to set a pre-determined depth of penetration of said needle.

~~8.~~5. The ~~biopsy and therapy device~~ rotary head according to any one of claims 1 to ~~7~~4, further including a drape for covering said biopsy device, said needling unit including a recess with which the drape is arranged to engage.

~~9. The biopsy and therapy device according to any one of claims 1 to 8, wherein the imaging module includes a probe sheath positioned on said probe and arranged to allow relative reciprocal motion with said probe.~~

6. The ~~biopsy and therapy device~~ rotary head according to any one of claims 1 to ~~9~~5, wherein said device is arranged to conduct a biopsy procedure based upon one or

more of the parameters: a needle insertion point defined as a coordinate position within said vertical plane, a first angle relative to the first principal axis, a second angle relative to the second principal axis and a depth of penetration of the needle.

7. The rotary head according to any one of claims 1 to 6, further including a platform to which said linkage and an imaging module are mounted, said image module including a ultrasound probe within a probe sheath positioned on said probe, said probe sheath arranged to allow relative reciprocal motion with said probe.

~~10.~~

~~11.~~8. A biopsy and therapy device comprising:

a needling unit for holding and inserting a biopsy needle;

an imaging module comprising an ultrasound probe and an actuator for moving the probe in a reciprocal action;

an arcuate slide mounted to a first linear slide;

a rotational linkage in sliding engagement with the arcuate slide;

said first linear slide arranged to move the arcuate slide parallel to a first principal axis;

said first linear slide mounted to a second linear side, said second linear slide arranged to move the first linear slide parallel to a second principal axis;

said needling unit mounted to said rotational linkage wherein the arcuate slide and rotational linkage are mounted perpendicular to each other so as to rotate the needling unit about said first and second principal axes.

~~12.~~9. A biopsy and therapy device comprising:

a needling unit for holding and inserting a biopsy needle;

an imaging module comprising an ultrasound probe and an actuator for moving the probe in a reciprocal action;

an arcuate slide and a parallel linkage to which the arcuate slide is mounted;

a rotational linkage in sliding engagement with the arcuate slide;

said parallel linkage arranged to move the arcuate slide and rotational ~~linakge~~ linkage within a vertical plane;

said needling unit mounted to said arcuate slide wherein the arcuate slide and rotational linkage are mounted perpendicular to each other so as to rotate the needling unit about respective first and second principal axes.

~~13.~~10. The biopsy and therapy device according to claim ~~11 or 12~~ 8 or 9, wherein the rotational linkage and arcuate slide are arranged to rotate the needling unit about a pivot point.

~~14.~~11. The biopsy and therapy device according to claim ~~12~~10, wherein the pivot point is located at a contact point of the needling unit.

~~15.~~12. The biopsy and therapy device according to any one of claims ~~11~~ 8 to ~~14~~11, wherein the rotational linkage includes a first pair of arms each mounted intermediate the needling unit and a drive, forming a parallelogram linkage;

a second pair of arms each mounted intermediate the drive and the arcuate slide for forming a second parallelogram linkage;

the drive arranged to extend and retract said first and second parallelogram linkages.

~~16.~~13. The biopsy and therapy device according to claim ~~11~~8, wherein the arcuate slide, rotational linkage and needling unit for a rotary head, said rotary head arranged to move along principal axes by said first and second linear slides.

~~17.~~14. The biopsy and therapy device according to any one of claims ~~11~~ 8 to ~~16~~13, wherein the needling unit includes a needle holder for holding a needle during insertion, said holder including a recess for receiving a needle in a direction transverse to the direction of insertion.

~~18.~~15. The biopsy and therapy device according to any one of claims ~~11~~ 8 to ~~17~~14, wherein said needling unit includes a needle stopper arranged to set a pre-determined depth of penetration of said needle.

~~19. The biopsy and therapy device according to any one of claims 11 to 18, further including a drape for covering said biopsy device, said needling unit including a recess with which the drape is arranged to engage.~~

~~20.~~16. The biopsy and therapy device according to any one of claims ~~11~~ 8 to ~~19~~15, wherein the imaging module includes a probe sheath positioned on said probe and arranged to allow relative reciprocal motion with said probe.

~~21.~~17. The biopsy and therapy device according to any one of claims ~~11~~ 8 to ~~20~~16, wherein said device is arranged to conduct a biopsy procedure based upon one or more of the parameters: a needle insertion point defined as a coordinate position within said vertical plane, a first angle relative to the first principal axis, a second angle relative to the second principal axis and a depth of penetration of the needle.