CLAIMS

We claim:

1. A system of instruments for installing a fusion implant (5) into a sacroiliac joint (3), the system of instruments comprising:

a working channel (10) having an insertion end (11) and a working end (12) connected by a working channel (13), the working channel (13) further comprising an alignment means (17);

a joint locator (20) having a penetration tip (23) at an insertion end (21), a handle at a proximal end (22), and a first keying means (27) for mating engagement with the alignment means (17);

an abrading device (30) having a an abrading head (32) at a distal end and a slide hammer assembly (40) at a proximal end, the abrading device (30) further comprising a second keying means (37) for mating engagement with the alignment means (17); and

an implant inserter (60) having an insertion end (62) with a pair of tines (63) for releasably receiving a joint fusion implant (5), the implant inserter (60) further comprising a third keying means (65) for mating engagement with the alignment means (17).

2. The system of instruments in claim 1, wherein the slide hammer assembly (40) of the abrading device (30) comprises a base (51) connected to a shaft (44), and a releasing

means that releasably connects a hammer sleeve (31) to the base (51), the released hammer sleeve (31) configured for sliding engagement along the shaft (44).

3. The system of instruments in claim 1, wherein the working channel (10) further comprises a channel collar (18) and the abrading device (30) further comprises an abrading stop (38), the channel collar (18) abutting the abrading stop (38) to prevent over penetration of the abrading head (32).

4. The system of instruments in claim 2, wherein the working channel (10) further comprises a channel collar (18) and the abrading device (30) further comprises an abrading stop (38), the channel collar (18) abutting the abrading stop (38) to prevent over penetration of the abrading head (32).

5. The system of instruments in claim 1, wherein the abrading head (32) further comprises an open tip (34) having a cutting edge (36).

6. The system of instruments in claim 2, wherein the abrading head (32) further comprises an open tip (34) having a cutting edge (36).

7. The system of instruments in claim 3, wherein the abrading head (32) further comprises an open tip (34) having a cutting edge (36).

8. The system of instruments in claim 1, wherein the insertion end (11) of the

working channel (10) further comprises a first iliac contour (15) and a first sacral contour (16), and the penetration tip (23) of the joint locator (20) further comprises a second iliac contour (24) and a second sacral contour (25), the first and second (15, 24) iliac contours and the first and second (16, 25) sacral contours disposed in mating alignment when the joint locator (20) is fully inserted into the working channel (10).

9. The system of instruments in claim 2, wherein the insertion end (11) of the working channel (10) further comprises a first iliac contour (15) and a first sacral contour (16), and the penetration tip (23) of the joint locator (20) further comprises a second iliac contour (24) and a second sacral contour (25), the first and second (15, 24) iliac contours and the first and second (16, 25) sacral contours disposed in mating alignment when the joint locator (20) is fully inserted into the working channel (10).

10. The system of instruments in claim 4, wherein the insertion end (11) of the working channel (10) further comprises a first iliac contour (15) and a first sacral contour (16), and the penetration tip (23) of the joint locator (20) further comprises a second iliac contour (24) and a second sacral contour (25), the first and second (15, 24) iliac contours and the first and second (16, 25) sacral contours disposed in mating alignment when the joint locator (20) is fully inserted into the working channel (10).

11. The system of instruments in claim 7, wherein the insertion end (11) of the working channel (10) further comprises a first iliac contour (15) and a first sacral contour (16), and the penetration tip (23) of the joint locator (20) further comprises a second iliac

contour (24) and a second sacral contour (25), the first and second (15, 24) iliac contours and the first and second (16, 25) sacral contours disposed in mating alignment when the joint locator (20) is fully inserted into the working channel (10).

12. A system of instruments for installing a fusion implant (5) into a sacroiliac joint (3), the system of instruments comprising:

a working channel (10) having an insertion end (11) and a working end (12) connected by a channel (13), the working channel (10) further comprising an alignment means (17);

a joint locator (20) having a penetration tip (23), a handle (22), and a first keying means (27) for mating engagement with the alignment means (17);

an abrading device (30) having a an abrading head (32) at a distal end and a slide hammer assembly (40) at a proximal end, the abrading device (30) further comprising a second keying means (37) for mating engagement with the alignment means (17), and the slide hammer assembly (40) comprising:

a collar (41) on the abrading device (30), the collar (41) having internal threads (42) and external threads (43);

a slide hammer shaft (44) having a threaded end (45) for mating with the internal threads (42) of the collar (41) on the abrading device (30), and having a slide stop end (46);

a hammer sleeve (31) having a hollow, cylindrical bore comprising an internal diaphragm (47) and a threaded connector (48) configured for mating with the external threads (43) of the

collar (41), the diaphragm (47) having a diaphragm opening (49) sized to permit sliding passage of the slide hammer shaft (44) and block passage of the slide stop end (46); and

an implant inserter (60) having an insertion end (62) with a pair of tines (63) for releasably receiving a joint fusion implant (5), the implant inserter (60) further comprising a third keying means (65) for mating engagement with the alignment means (17).

13. The system of instruments in claim 12, wherein the working channel (10) further comprises a channel collar (18) and the abrading device (30) further comprises an abrading stop (38), the channel collar (18) abutting the abrading stop (38) to prevent over penetration of the abrading head (32).

14. The system of instruments in claim 12, wherein the abrading head (32) further comprises an open tip (34) having a cutting edge (36).

15. The system of instruments in claim 13, wherein the abrading head (32) further comprises an open tip (34) having a cutting edge (36).

16. The system of instruments in claim 12, wherein the insertion end (11) of the working channel (10) further comprises a first iliac contour (15) and a first sacral contour (16), and the penetration tip (23) of the joint locator (20) further comprises a second iliac

contour (24) and a second sacral contour (25), the first and second (15, 24) iliac contours and the first and second (16, 25) sacral contours disposed in mating alignment when the joint locator (20) is fully inserted into the working channel (10).

17. The system of instruments in claim 13, wherein the insertion end (11) of the working channel (10) further comprises a first iliac contour (15) and a first sacral contour (16), and the penetration tip (23) of the joint locator (20) further comprises a second iliac contour (24) and a second sacral contour (25), the first and second (15, 24) iliac contours and the first and second (16, 25) sacral contours disposed in mating alignment when the joint locator (20) is fully inserted into the working channel (10).

18. The system of instruments in claim 14, wherein the insertion end (11) of the working channel (10) further comprises a first iliac contour (15) and a first sacral contour (16), and the penetration tip (23) of the joint locator (20) further comprises a second iliac contour (24) and a second sacral contour (25), the first and second (15, 24) iliac contours and the first and second (16, 25) sacral contours disposed in mating alignment when the joint locator (20) is fully inserted into the working channel (10).

19. The system of instruments in claim 15, wherein the insertion end (11) of the working channel (10) further comprises a first iliac contour (15) and a first sacral contour (16), and the penetration tip (23) of the joint locator (20) further comprises a second iliac contour (24) and a second sacral contour (25), the first and second (15, 24) iliac contours and the first and second (16, 25) sacral contours disposed in mating alignment when the

joint locator (20) is fully inserted into the working channel (10).

20. The system of instruments in claim 19, wherein the joint locator (20) has an elongate body between the penetration tip (23) and the handle (22), and a K-wire channel (26) extending through the elongate body from the handle (22) to the penetration tip (23) of the joint locator (20).

CLAIMS

We claim:

1. A system of instruments for installing a fusion implant into a sacroiliac joint, the system of instruments comprising:

a working channel having an insertion end and a working end connected by a working channel, the working channel further comprising an alignment means;

a joint locator having a penetration tip at an insertion end, a handle at a proximal end, and a first keying means for mating engagement with the alignment means;

an abrading device having a an abrading head at a distal end and a slide hammer assembly at a proximal end, the abrading device further comprising a second keying means for mating engagement with the alignment means; and

an implant inserter having an insertion end with a pair of tines for releasably receiving a joint fusion implant, the implant inserter further comprising a third keying means for mating engagement with the alignment means.

2. The system of instruments in claim 1, wherein the slide hammer assembly of the abrading device comprises a base connected to a shaft, and a releasing means that releasably connects a hammer sleeve to the base, the released hammer sleeve configured for sliding engagement along the shaft.

3. The system of instruments in claim 1, wherein the working channel further comprises a channel collar and the abrading device further comprises an abrading stop, the channel collar abutting the abrading stop to prevent over penetration of the abrading head.

4. The system of instruments in claim 2, wherein the working channel further comprises a channel collar and the abrading device further comprises an abrading stop, the channel collar abutting the abrading stop to prevent over penetration of the abrading head.

5. The system of instruments in claim 1, wherein the abrading head further comprises an open tip having a cutting edge.

6. The system of instruments in claim 2, wherein the abrading head further comprises an open tip having a cutting edge.

7. The system of instruments in claim 3, wherein the abrading head further comprises an open tip having a cutting edge.

8. The system of instruments in claim 1, wherein the insertion end of the working channel farther comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

9. The system of instruments in claim 2, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

10. The system of instruments in claim 4, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

11. The system of instruments in claim 7, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint

locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

12. A system of instruments for installing a fusion implant into a sacroiliac joint, the system of instruments comprising:

a working channel having an insertion end and a working end connected by a channel, the working channel further comprising an alignment means;

a joint locator having a penetration tip, a handle, and a first keying means for mating engagement with the alignment means; an abrading device having a an abrading head at a distal end and a slide hammer assembly at a proximal end, the abrading device further comprising a second keying means for mating engagement with the alignment means, and the slide hammer assembly comprising:

a collar on the abrading device, the collar having internal threads and external threads;

a slide hammer shaft having a threaded end for mating with the internal threads of the collar on the abrading device, and having a slide stop end;

a hammer sleeve having a hollow, cylindrical bore comprising an internal diaphragm and a threaded connector configured for mating with the external threads of the collar, the diaphragm having a diaphragm opening sized to permit sliding passage of the slide hammer shaft and block passage of the slide stop end; and

an implant inserter having an insertion end with a pair of tines for releasably receiving a joint fusion implant, the implant inserter further comprising a third keying means for mating engagement with the alignment means.

13. The system of instruments in claim 12, wherein the working channel further comprises a channel collar and the abrading device further comprises an abrading stop, the channel collar abutting the abrading stop to prevent over penetration of the abrading head.

14. The system of instruments in claim 12, wherein the abrading head further comprises an open tip having a cutting edge.

15. The system of instruments in claim 13, wherein the abrading head further comprises an open tip having a cutting edge.

16. The system of instruments in claim 12, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

17. The system of instruments in claim 13, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

18. The system of instruments in claim 14, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

19. The system of instruments in claim 15, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

20. The system of instruments in claim 19, wherein the joint locator has an elongate body between the penetration tip and the handle, and a K-wire channel extending through the elongate body from the handle to the penetration tip of the joint locator.

21. A system of instruments for installing a fusion implant into a sacroiliac joint, the system of instruments comprising:

a working channel having an insertion end and a working end connected by a working channel, the working channel further comprising an alignment means;

a joint locator having a penetration tip at an insertion end, a handle at a proximal end, and a first keying means for mating engagement with the alignment means;

an abrading device having a an abrading head at a distal end and a slide hammer assembly at a proximal end, the abrading device further comprising a second keying means for mating engagement with the alignment means; and

an implant inserter having an insertion end with a pair of tines for releasably receiving a joint fusion implant, the implant inserter further comprising a third keying means for mating engagement with the alignment means.

22. The system of instruments in claim 21, wherein the slide hammer assembly of the abrading device comprises a base connected to a shaft, and a releasing means that releasably connects a hammer sleeve to the base, the released hammer sleeve configured for sliding engagement along the shaft.

23. The system of instruments in claim 21, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

24. A system of instruments for installing a fusion implant into a sacroiliac joint, the system of instruments comprising:

a working channel having an insertion end and a working end connected by a channel, the working channel further comprising an alignment means;

a joint locator having a penetration tip, a handle, and a first keying means for mating engagement with the alignment means;

an abrading device having a an abrading head at a distal end and a slide hammer assembly at a proximal end, the abrading device further comprising a second keying means for mating engagement with the alignment means, and the slide hammer assembly comprising:

a collar on the abrading device, the collar having internal threads and external threads;

a slide hammer shaft having a threaded end for mating with the internal threads of the collar on the abrading device, and having a slide stop end;

a hammer sleeve having a hollow, cylindrical bore comprising an internal diaphragm and a threaded connector configured for mating with the external threads of the collar, the diaphragm having a diaphragm opening sized to permit sliding passage of the slide hammer shaft and block passage of the slide stop end; and

an implant inserter having an insertion end with a pair of tines for releasably receiving a joint fusion implant, the implant inserter further comprising a third keying means for mating engagement with the alignment means.

25. The system of instruments in claim 24, wherein the abrading head further comprises an open tip having a cutting edge.

26. The system of instruments in claim 24, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

27. A set of instruments for installing a fusion implant into a sacroiliac joint, the set of instruments comprising:

a working channel having an insertion end and a working end, the working channel further comprising an alignment means;

a joint locator having a penetration tip at an insertion end, a handle at a proximal end, and a first keying means for mating engagement with the alignment means;

an abrading device having a an abrading head at a distal end, the abrading device further comprising a second keying means for mating engagement with the alignment means; and

an implant inserter having an insertion end with a pair of tines for releasably receiving a joint fusion implant, the implant inserter further comprising a third keying means for mating engagement with the alignment means.

28. The set of instruments in claim 27, wherein the abrading head further comprises an open tip having a cutting edge.

29. The set of instruments in claim 27, wherein the insertion end of the working channel further comprises a first iliac contour and a first sacral contour, and the penetration tip of the joint locator further comprises a second iliac contour and a second sacral contour, the first and second iliac contours and the first and second sacral contours disposed in mating alignment when the joint locator is fully inserted into the working channel.

30. A set of instruments for installing a fusion implant into a sacroiliac joint, the set of instruments comprising:

a working channel having an insertion end comprising a first iliac contour and a first sacral contour, a working end having a collar and an alignment means; and

a joint locator having an insertion end with a penetration tip that comprises a second iliac contour and a second sacral contour, a proximal end having a handle comprising a stop for abutting against the collar on the working channel, and a first keying means for mating

engagement with the alignment means when the joint locator is inserted into the working channel;

wherein the first and second iliac contours and the first and second sacral contours are disposed in mating alignment when the joint locator is fully inserted into the working channel.