

IPR2023-00625

U.S. Patent No. 11,020,129

Orthocision, Inc. v. PainTEQ, LLC

Petitioner's Demonstratives
Oral Hearing, July 1, 2024

Motivation to Combine

- Compton, Schifano, Donner, and Black (“SI Fusion Refs”) all disclose posterior approach sacroiliac fusion techniques
- SI Fusion Refs all disclose insertion of fusion implants between the articular surfaces of the Sacrum and Ilium in the SI Joint
- SI Fusion Refs all disclose preparing the articular surfaces with a cutting instrument and a rasp or toothed instrument, or a combination thereof (Donner)

Motivation to Combine – Highly related and overlapping

- SI FUSION REFS all disclose methods and instruments from the same field (spinal orthopedic surgery), using highly similar instruments used to accomplish the same functions
 - Combinations made from these references are merely simple combinations of known methods and instruments, guided by known anatomical attributes or constraints that achieve the same or complementary functions and because of their well-known uses, structure and function, provide safe and predictable results. (Petition, 21-22; Ex.1017; ¶¶ 28,35).
 - Surgical instruments such as cannulas, slide hammers, chisels, and rasps can be adapted between surgeries of various implant types and shapes, and are regularly adapted to adjust surgical approaches or to novel surgical methods addressing the same or similar medical conditions. (Ex. 1022, ¶45).
 - POSITA would look to such related procedures in devising a posterior sacroiliac fusion approach like that disclosed in the '129 patent with reasonable expectations of success. (Ex.1017; ¶110).

Motivation to Combine – Posterior Approach

- SI Fusion Refs all disclose posterior approach sacroiliac fusion techniques – similar techniques, instrumentation, and methodology. (Petition, 21-22; Ex.1017, ¶28).
 - The approach is from the posterior of the patient

Compton

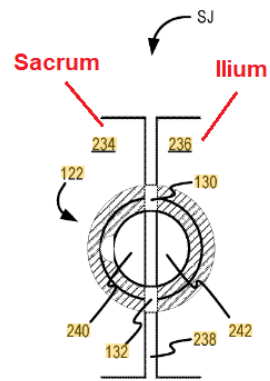


FIG. 15

Schifano

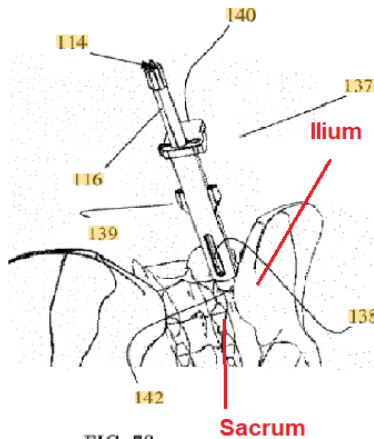


FIG. 78

Black

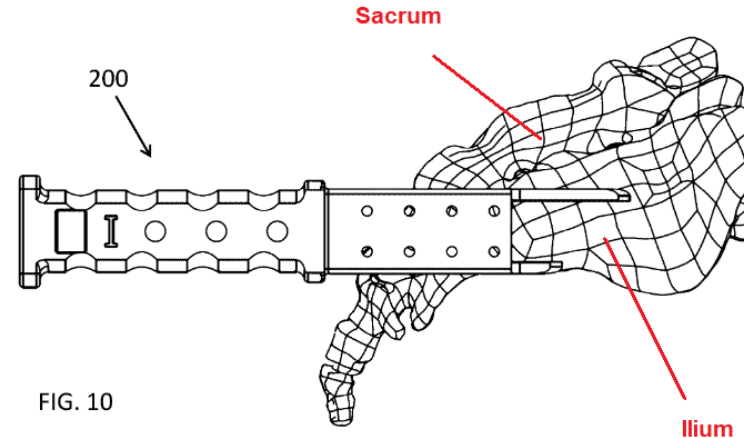


FIG. 10

Donner

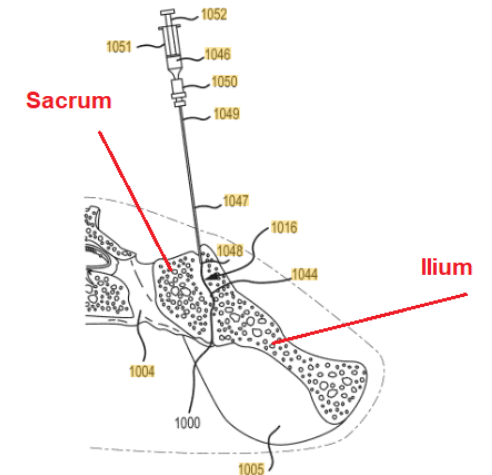
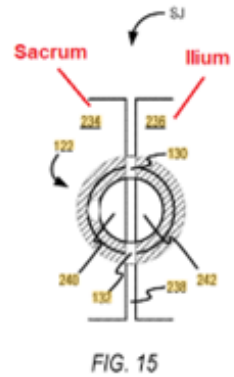


FIG. 49A

Motivation to Combine – Posterior Approach

Compton



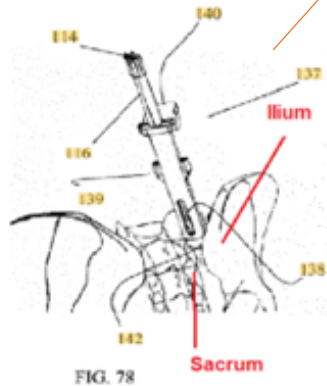
Compton discloses a posterior approach for SI Joint fusion with an implant inserted into the articular space between the sacrum and ilium. (Petition, 51;Ex.1017; ¶111).

Schifano discloses methods and instruments for a posterior approach for SI Joint fusion. (Petition, 60; Ex.1003, Abstract).

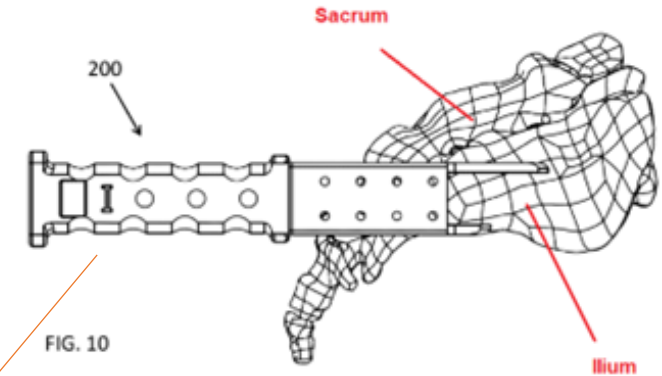
Black discloses methods and instruments for a posterior approach for SI Joint fusion. (Petition, 73; Ex.1005, Abstract, ¶¶[0048]-[0049]).

Donner discloses a system and method for preparing the SI joint and delivering an implant to the SI joint through a posterior approach. (Petition, 39; Ex.1006, Abstract, ¶¶[0145],[0156]).

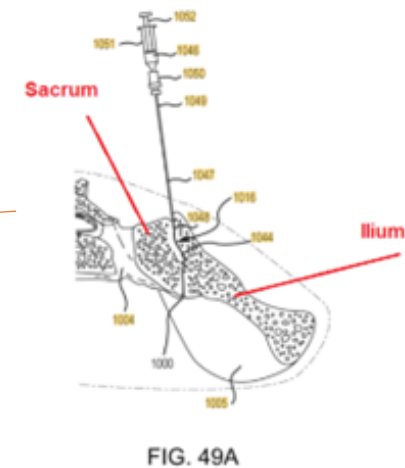
Schifano



Black



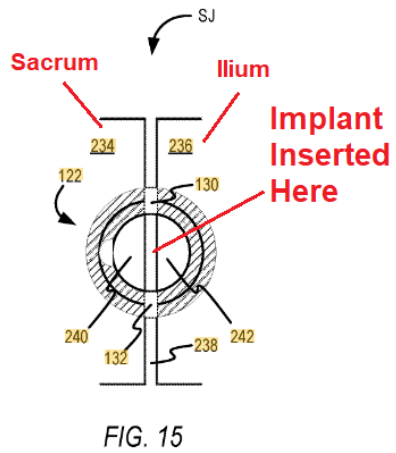
Donner



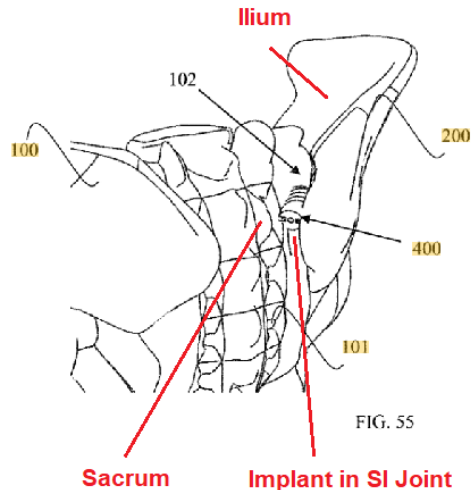
Motivation to Combine – Implant Between SJ

- SI Fusion Refs all disclose insertion of fusion implants between the articular surfaces of the Sacrum and Ilium in the SI Joint.
 - Fusion implant is inserted between the articular surfaces of the SI Joint

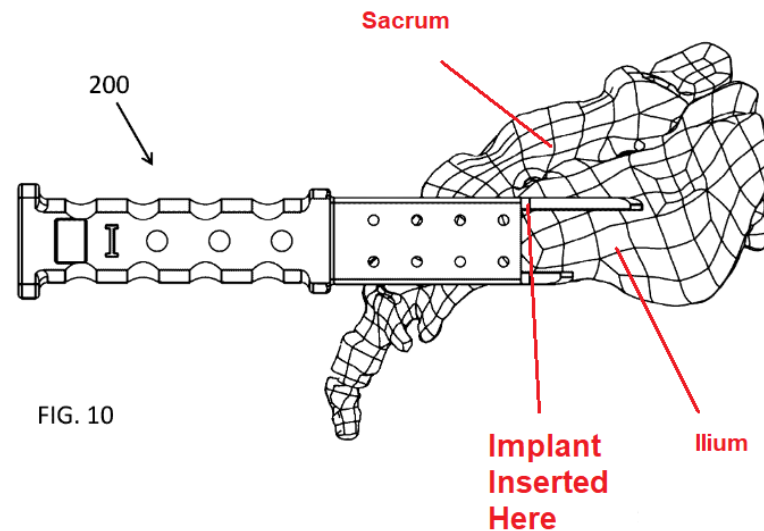
Compton



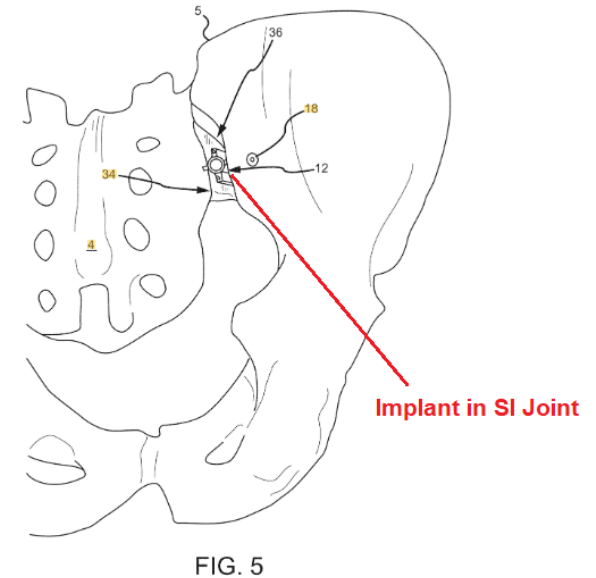
Schifano



Black

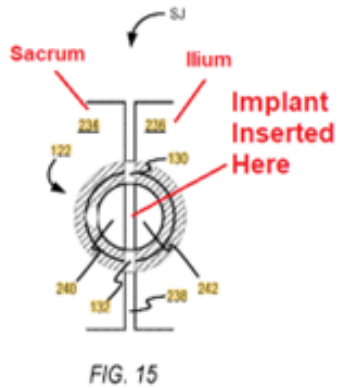


Donner



Motivation to Combine – Implant Between SJ

Compton

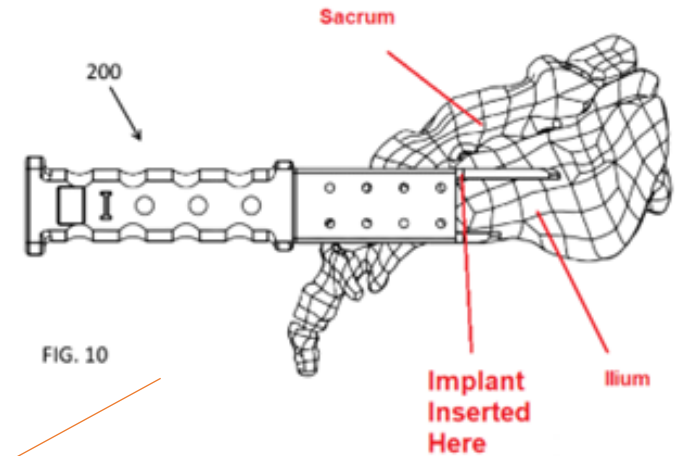


Compton discloses a posterior approach for SI Joint fusion with an implant inserted into the articular space between the sacrum and ilium. (Petition, 51;Ex.1017; ¶111).

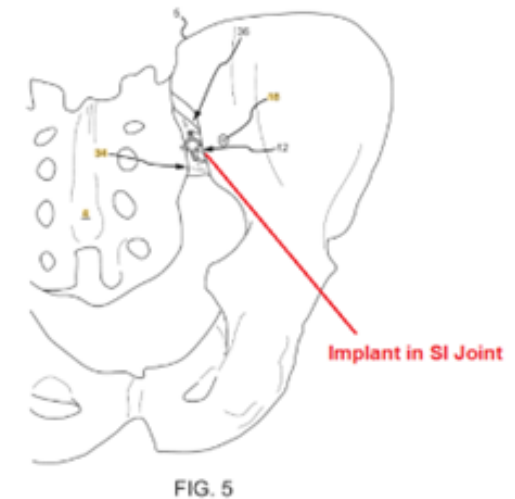
Schifano teaches inserting a rectangular implant into a void in the SI Joint. (Petition, 68; Ex.1003, 31:47-56).

Black discloses an implant having a rectangular shape (as shown in FIGS. 5C and 6A-6D provided below) may be inserted into the prepared SI Joint. (Petition, 38;Ex.1005, ¶¶[0101],[0109]).

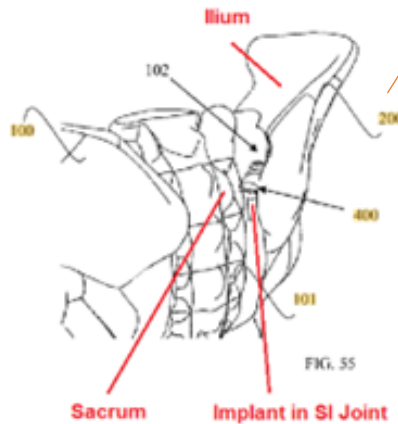
Black



Donner



Schifano



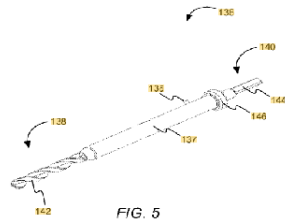
Donner discloses a posterior approach for SI Joint fusion with an implant inserted into the articular space between the sacrum and ilium. (Petition, 51;Ex.1017; ¶111).

Motivation to Combine – Cutting Tool + Rasp

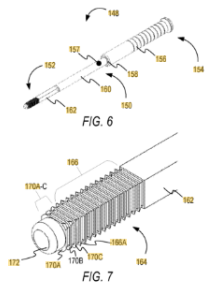
- SI Fusion Refs all disclose preparing the articular surfaces with cutting instrument(s) and a rasp or toothed instrument.

Compton

Cutting Instrument

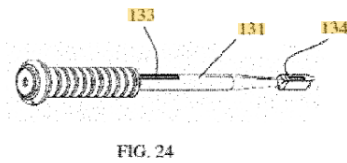


Broach - toothed cutting tool

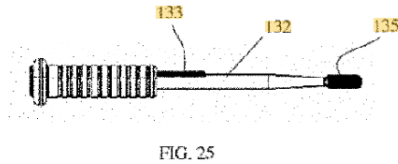


Schifano

Box Chisel

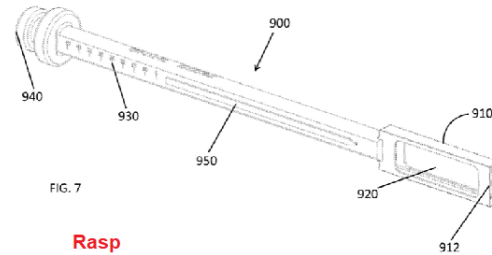


Rasp

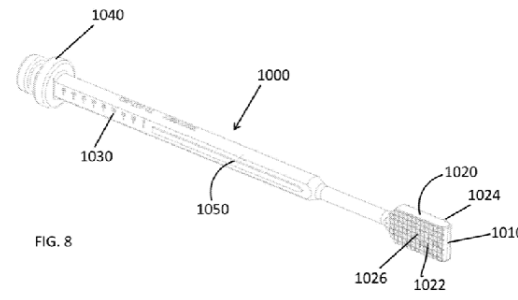


Black

Box Chisel

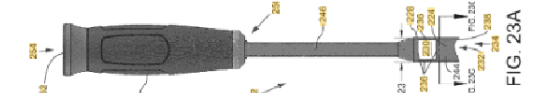


Rasp

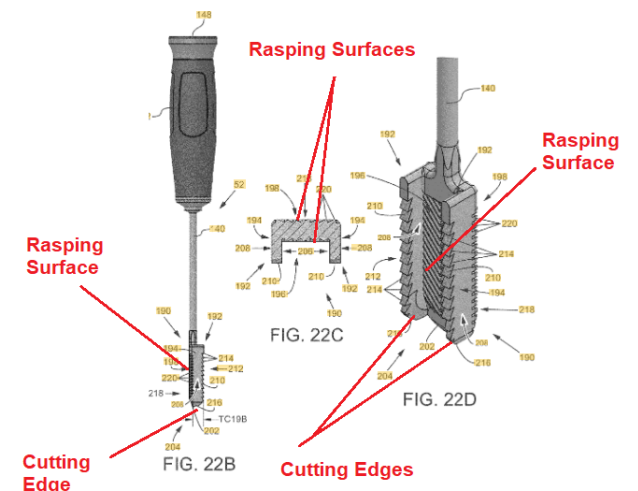


Donner

Box Chisel



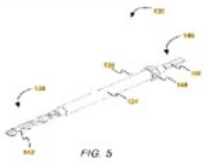
Cutting Tool - Rasp Combination



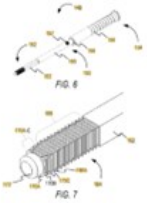
Motivation to Combine – Cutting Tool + Rasp

Compton

Cutting Instrument

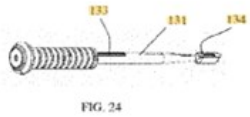


Broach - toothed cutting tool

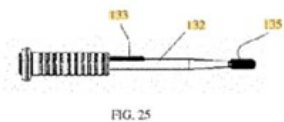


Schifano

Box Chisel



Rasp



A drill 136 may be used to create a pilot hole in the SI Joint tissue. (Ex.1004, 4:14-22). A broach device 148 (rasp) having cutting teeth 166 on a rectangular incising member 164 thereof is used to further excavate bone tissue of the sacrum and ilium in the pilot hole and give the pilot hole a rectangular shape, see below in FIGS. 6-7. (Petition, 26; Ex.1004, 4:35-53, 5:1-44).

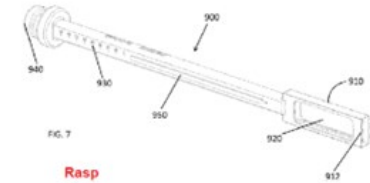
A box chisel 131 is passed through the working channel and into the SI Joint and used to penetrate cortical tissue of the sacrum and ilium to prepare the SI joint. (Petition, 30; Ex.1003, 19:40-65). A rasp 132 is passed through the working channel and into the SI Joint to further prepare the bone for the fusion implant. (Petition, 31; Ex.1003, 15:21-34, 19:66-20:2).

A box chisel 900 is passed through the working cannula 200 and is used to create an implant void as it is inserted into the SI Joint. (Petition, 36; Ex.1005, ¶[0096]). Black further discloses passing a rasp 1000 through the working cannula 200 to prepare the SI Joint, as shown in FIG. 8 provided below. (Petition, 37; Ex.1005, ¶[0075]).

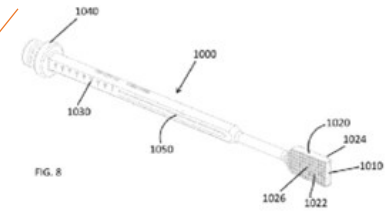
Donner discloses an embodiment of a tooling head 52 for forming a space in the SI Joint that matches the shape of an implant for placement in the SI Joint. (Ex.1006, ¶[0189]). The tooling head 52 includes abrading surfaces (rasping surfaces 218) including ridges 220 on each of a pair of opposing sides (top surface 196 and bottom surface 198) and an open tip having a cutting edge 216 for cutting through the ilium and sacrum, as shown below in FIGS. 22C-22D. (Petition, 41-42; Ex.1006, ¶¶[0188]-[0190]). (Petition, 51; Ex.1017; ¶111).

Black

Box Chisel



Rasp

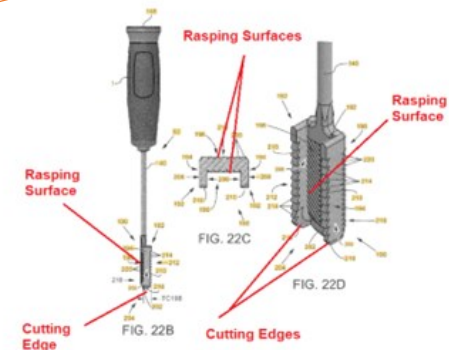


Donner

Box Chisel



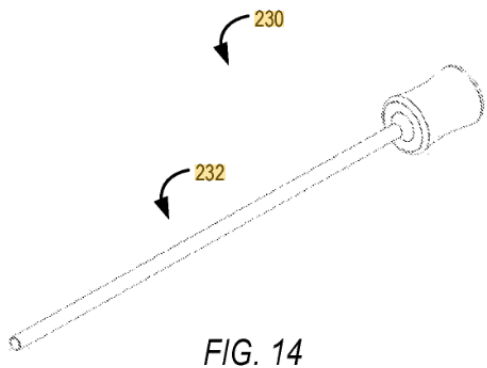
Cutting Tool - Rasp Combination



Motivation to Combine – Impactors and Slap Hammers

- SI Fusion Refs all disclose preparing the articular surfaces with slap hammers or a slide hammer to drive instruments into the SI joint.

Compton



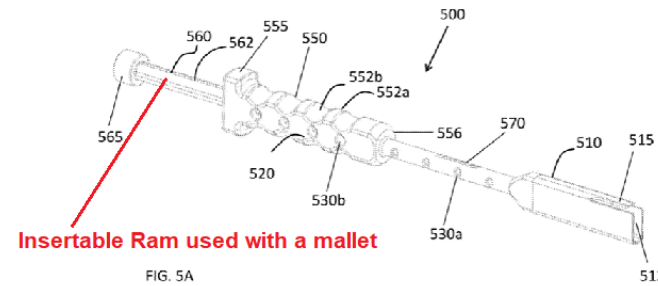
Impactor used with a hammer or similar device

Schifano



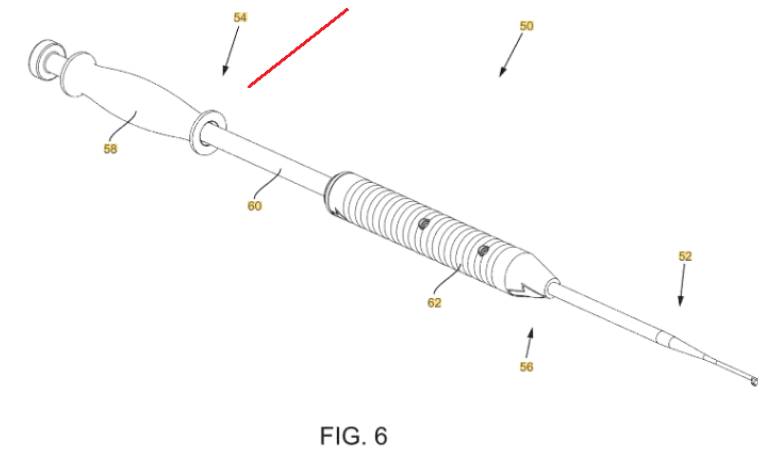
Impactor used with a hammer or similar device

Black



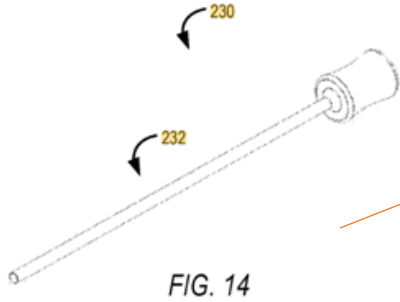
Donner

Slap Hammer Assembly



Motivation to Combine – Impactors and Slap Hammers

Compton



Impactor used with a hammer or similar device

FIG. 14

Schifano



FIG. 26

Impactor used with a hammer or similar device

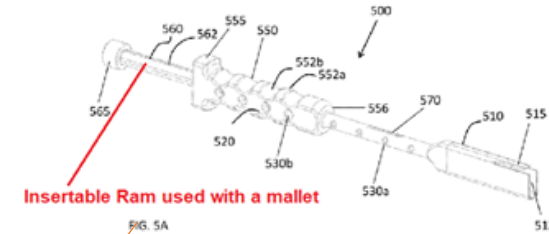
Slap hammers and slide hammers are commonly used in the relevant art with the instruments disclosed by Compton, including the broach 148. (Petition, 53; Ex.1017, ¶123; Ex.1004, 6:51-59).

Schifano discloses an orthopedic spinal procedure that includes the use of an impactor and tools that are conventionally used with hammers and slap hammers, such as a box chisel or rasp. (Petition, 63; Ex.1009, 1:5-8).

Black discloses a SI joint fusion procedure that includes the use of an impactor and tools that are conventionally used with slap hammers, such as a box chisel or rasp. (Petition, 74; Ex.1017, ¶171).

Donner discloses a slide hammer assembly for use in a SI Joint fusion procedure. The joint preparation tool 50 of Donner includes a slap hammer assembly 54 and a cutting tool assembly 56. (Petition, 57; Ex.1006, ¶[0164]).

Black



Insertable Ram used with a mallet

FIG. 5A

Donner

Slap Hammer Assembly

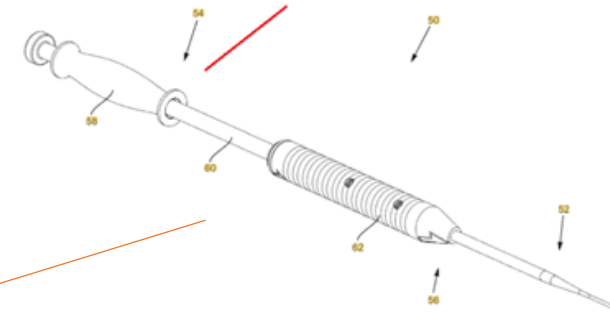


FIG. 6

Motivation to Combine – Same General Steps in SI Fusion Refs

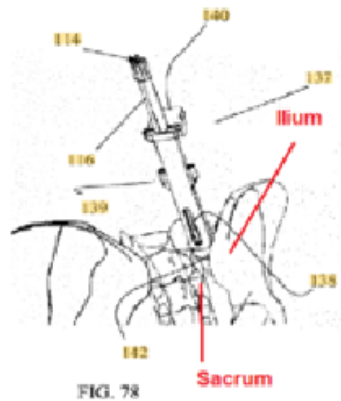


FIG. 78

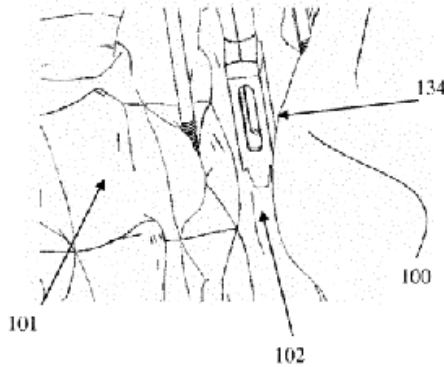


FIG. 87

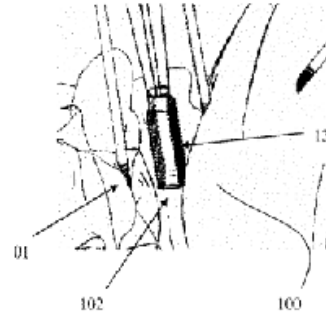


FIG. 89



FIG. 26

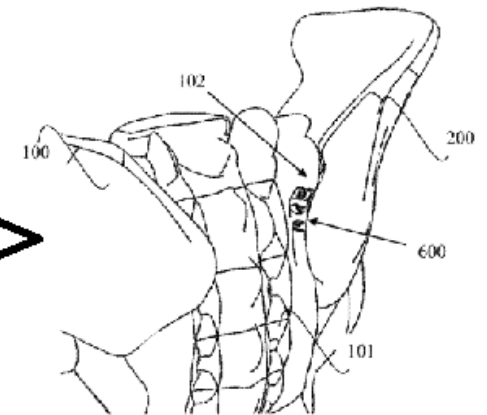
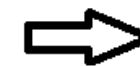


FIG. 62

GENERAL STEP 1:
All of the methods of the SI Fusion Refs include finding the posterior aspect of the SI Joint and inserting a cannula for access to SI Joint Space

GENERAL STEP 2:
All of the methods of the SI Fusion Refs include one or more steps cutting the connective tissue in the SI Joint with a drill or chisel.

GENERAL STEP 3:
All of the methods of the SI Fusion Refs include decorticating the articular surfaces with a rasp or broach.

GENERAL STEP 3A:
All of the methods of the SI Fusion Refs include using a mallet, hammer, and/or impactor with the rasp or broach tool.

GENERAL STEP 4:
All of the methods of the SI Fusion Refs include inserting an fusion implant into the articular space

Motivation to Combine – General Step 1 compared to ‘129 Patent

Independent Claim 1 “Preamble”	A method of forming an implant void in a sacroiliac joint without the use of a rotary cutting instrument, the method comprising the steps of:
Limitation 1(a) “locating insertion point”	locating an insertion point in the sacroiliac joint, the insertion point defining an intended location for the implant void;
Limitation 1(b) “introducing working channel”	introducing a working channel into the insertion point, the working channel having an insertion end and a working end, , the insertion end of the working channel further comprising a first iliac contour, a first sacral contour, and insertion arms;
Limitation 1(c) “inserting arms”	inserting the insertion arms into the sacroiliac joint at the insertion point such that the first sacral contour is seated against a sacrum bone and the first iliac contour is seated against an ilium;

GENERAL STEP 1:
Steps 1(a) – 1(c) of
the ‘129 Patent
correspond to
General Step 1 of the
SI Fusion Refs

Motivation to Combine – General Steps 2-3(a) compared to ‘129 Patent

Limitation 1(d) “introducing abrading device comprising”	introducing an abrading device into the working channel, the abrading device comprising:
Limitation 1(d)(i) “an abrading head”	an abrading head at a distal end of the abrading device, the abrading head having:
Limitation 1(d)(i)(a) “abrading surfaces”	abrading surfaces on each of a first pair of opposing sides, the abrading surfaces comprising one or more teeth, barbs, blades, ridges, slots, broaches, or other members capable of abrading a cortical bone of the sacroiliac joint; and
Limitation 1(d)(i)(b) “an open tip / cutting edge”	an open tip comprising a cutting edge disposed at a leading edge of the open tip, the cutting edge configured to cut bone tissue in the sacroiliac joint; and
Limitation 1(d)(i)(c) “a slide hammer / released position / locked position / releasing means”	II. a slide hammer assembly at a proximal end of the abrading device, the slide hammer assembly having a released position that enables operation of the slide hammer assembly, a locked position that prohibits operation of the slide hammer assembly, and a releasing means for transitioning the slide hammer assembly between the locked position and the released position; and
Limitation 1(e) “advancing the abrading device”	advancing the abrading device into the sacroiliac joint such that the open tip cuts bone tissue away from the sacrum or the ilium and the abrading surfaces decorticate the cortical bone inside the sacroiliac joint, thereby forming a decorticated implant void at the insertion point without using a rotary cutting instrument.

GENERAL STEPS 2-3(a):
Steps 1(d)(i)(a) – 1(d)(i)(b)
and 1(e) of the ‘129 Patent
correspond to General Step
2-3(a) of the SI Fusion Refs

Motivation to Combine – General Steps 4 compared to ‘129 Patent

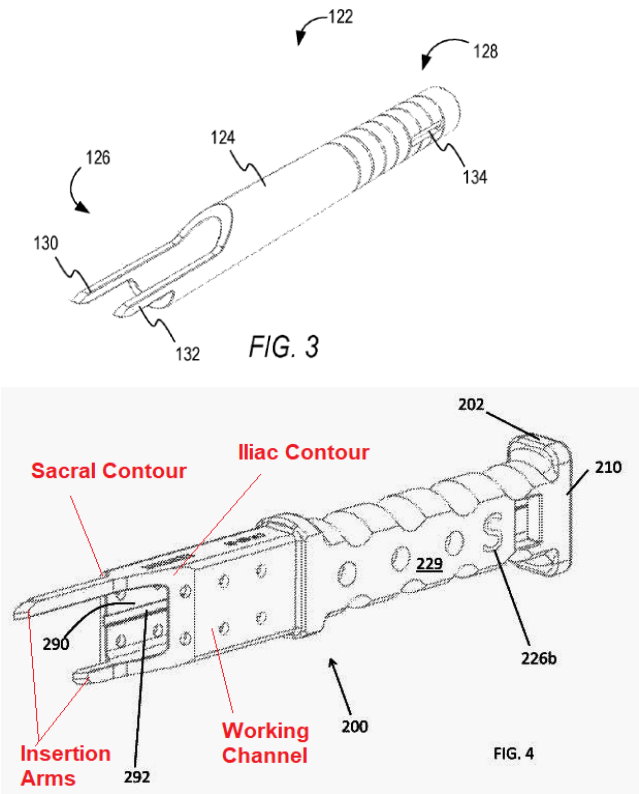
Limitation 1(d) “introducing abrading device comprising”	introducing an abrading device into the working channel, the abrading device comprising:
Limitation 1(d)(i) “an abrading head”	an abrading head at a distal end of the abrading device, the abrading head having:
Limitation 1(d)(i)(a) “abrading surfaces”	abrading surfaces on each of a first pair of opposing sides, the abrading surfaces comprising one or more teeth, barbs, blades, ridges, slots, broaches, or other members capable of abrading a cortical bone of the sacroiliac joint; and
Limitation 1(d)(i)(b) “an open tip / cutting edge”	an open tip comprising a cutting edge disposed at a leading edge of the open tip, the cutting edge configured to cut bone tissue in the sacroiliac joint; and
Limitation 1(d)(i)(c) “a slide hammer / released position / locked position / releasing means”	II. a slide hammer assembly at a proximal end of the abrading device, the slide hammer assembly having a released position that enables operation of the slide hammer assembly, a locked position that prohibits operation of the slide hammer assembly, and a releasing means for transitioning the slide hammer assembly between the locked position and the released position; and
Limitation 1(e) “advancing the abrading device”	advancing the abrading device into the sacroiliac joint such that the open tip cuts bone tissue away from the sacrum or the ilium and the abrading surfaces decorticate the cortical bone inside the sacroiliac joint, thereby forming a decorticated implant void at the insertion point without using a rotary cutting instrument.

GENERAL STEP 4:
Step 1(e) of the ‘129 Patent correspond to General Step 4 of the SI Fusion Refs – Insertion of an implant into an implant void having a complementary shape

Motivation to Combine – Features beyond the basic, general Steps 1-4.

Independent Claim 1 “Preamble”	A method of forming an implant void in a sacroiliac joint without the use of a rotary cutting instrument, the method comprising the steps of:
Limitation 1(a) “locating insertion point”	locating an insertion point in the sacroiliac joint, the insertion point defining an intended location for the implant void;
Limitation 1(b) “introducing working channel”	introducing a working channel into the insertion point, the working channel having an insertion end and a working end, the insertion end of the working channel further comprising a first iliac contour, a first sacral contour, and insertion arms;
Limitation 1(c) “inserting arms”	inserting the insertion arms into the sacroiliac joint at the insertion point such that the first sacral contour is seated against a sacrum bone and the first iliac contour is seated against an ilium;

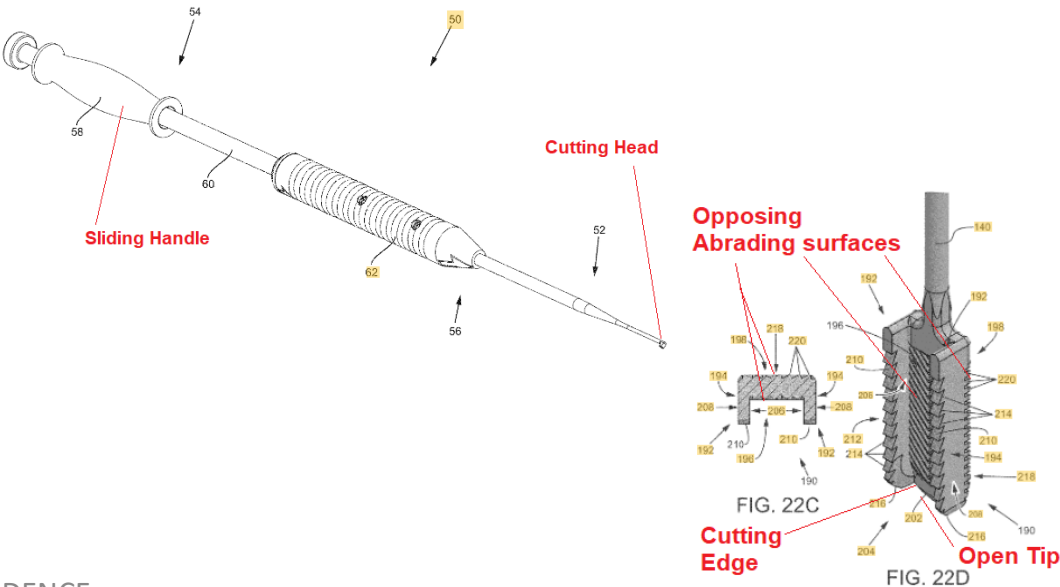
GENERAL STEP 1:
The highlighted limitations are more specific than General Step 1. However, Compton and Black disclose cannulas that include sacral and iliac contours of the ‘129 Patent.



Motivation to Combine – Features beyond the basic, general Steps 1-4.

Limitation 1(d) “introducing abrading device comprising”	introducing an abrading device into the working channel, the abrading device comprising:
Limitation 1(d)(i) “an abrading head”	an abrading head at a distal end of the abrading device, the abrading head having:
Limitation 1(d)(i)(a) “abrading surfaces”	abrading surfaces on each of a first pair of opposing sides, the abrading surfaces comprising one or more teeth, barbs, blades, ridges, slots, broaches, or other members capable of abrading a cortical bone of the sacroiliac joint; and
Limitation 1(d)(i)(b) “an open tip / cutting edge”	an open tip comprising a cutting edge disposed at a leading edge of the open tip, the cutting edge configured to cut bone tissue in the sacroiliac joint; and
Limitation 1(d)(i)(c) “a slide hammer / released position / locked position / releasing means”	II. a slide hammer assembly at a proximal end of the abrading device, the slide hammer assembly having a released position that enables operation of the slide hammer assembly, , a locked position that prohibits operation of the slide hammer assembly, and a releasing means for transitioning the slide hammer assembly between the locked position and the released position; and
Limitation 1(e) “advancing the abrading device”	advancing the abrading device into the sacroiliac joint such that the open tip cuts bone tissue away from the sacrum or the ilium and the abrading surfaces decorticate the cortical bone inside the sacroiliac joint, thereby forming a decorticated implant void at the insertion point without using a rotary cutting instrument.

GENERAL STEPS 2-3(a):
The highlighted limitations the combination of the of abrading surfaces on opposing sides and a open tip/leading cutting edge in a single abrading head on a slide hammer assembly are more specific than General Steps 2-3(a). However, Donner discloses both the slide hammer assembly and abrading head having abrading surfaces and an open tip with a leading cutting edge.



Motivation to Combine – Basis for Grant

- Patentability in the NOA: the prior art of record did not disclose or suggest “a method of forming an implant void in a sacroiliac joint comprising at least the steps *of inserting working channel including arms and iliac/sacral contours and introducing abrading device including open tip and slap hammer*”. (Ex 1002, 46; emphasis added).
 - Compton discloses a cannula having arms and contours that are nearly identical to those of the cannula disclosed and illustrated in the ‘129 Patent.
 - Donner discloses *introducing abrading device including open tip and slap hammer*.

Motivation to Combine – Features beyond the basic, general Steps 1-4.

Limitation 1(d) “introducing abrading device comprising”	introducing an abrading device into the working channel, the abrading device comprising:
Limitation 1(d)(i) “an abrading head”	an abrading head at a distal end of the abrading device, the abrading head having:
Limitation 1(d)(i)(a) “abrading surfaces”	abrading surfaces on each of a first pair of opposing sides, the abrading surfaces comprising one or more teeth, barbs, blades, ridges, slots, broaches, or other members capable of abrading a cortical bone of the sacroiliac joint; and
Limitation 1(d)(i)(b) “an open tip / cutting edge”	an open tip comprising a cutting edge disposed at a leading edge of the open tip, the cutting edge configured to cut bone tissue in the sacroiliac joint; and
Limitation 1(d)(i)(c) “a slide hammer / released position / locked position / releasing means”	II. a slide hammer assembly at a proximal end of the abrading device, the slide hammer assembly having a released position that enables operation of the slide hammer assembly, a locked position that prohibits operation of the slide hammer assembly, and a releasing means for transitioning the slide hammer assembly between the locked position and the released position; and
Limitation 1(e) “advancing the abrading device”	advancing the abrading device into the sacroiliac joint such that the open tip cuts bone tissue away from the sacrum or the ilium and the abrading surfaces decorticate the cortical bone inside the sacroiliac joint, thereby forming a decorticated implant void at the insertion point without using a rotary cutting instrument.

GENERAL STEPs 2-3(a):

The highlighted limitations are more specific than General Steps 2-3(a). However, Donner and Black disclose using chisel and rasp tools to cut the joint tissue “without a rotary cutting instrument”.

DONNER:

The tooling head 52 is used to prepare the SI Joint and form a decorticated implant void in the absence of a drill or other rotary cutting instrument. (Petition, 11; Ex.1006, ¶[0188]).

BLACK:

Black also discloses using a drill guide 1100 and drill, but Black indicates that the box chisel 900 can be used alternatively to a drill. (Petition, 36; Ex.1005, ¶[0096]).

LEVEL OF ORDINARY SKILL IN THE ART

- The POSITA has a high level of skill:
 - someone with at least a Bachelor's of Science in Mechanical, Biomechanical or Biomedical engineering, or a related field of science, as well as at least three years of experience in the field of orthopedic implants, or
 - a practicing spinal orthopedic surgeon with at least 3 years of experience and at least some experience in the design and/or use of spinal orthopedic implants, such as with sacroiliac joint fusion procedures and the surgical tools required to perform such procedures
- POSITA would have knowledge of spinal joint fusion implants, surgical instruments for spinal fusion surgeries, and the application of fusion implants in spinal fusion procedures and/or sacroiliac fusion procedures. (Ex. 1022, ¶19).

Motivation to Combine – Highly related and overlapping

- SI FUSION REFS all disclose methods and instruments from the same field (spinal orthopedic surgery), using highly similar instruments to accomplish the same functions
 - Combinations made from these references are merely simple combinations of known methods and instruments, guided by known anatomical attributes or constraints that achieve the same or complimentary functions and because of their well-known uses, structure and function, provide safe and predictable results. (Petition, 21-22; Ex.1017; ¶¶ 28,35).
 - POSITA would have found methods and instruments utilized in spinal orthopedic procedures, including interbody fusion and sacroiliac fusion methods, and general instruments used in orthopedic procedures (e.g., cannulas, slide hammers, chisels, and rasps) to be highly related to the claimed methods of the '129 patent. (Petition, 52; Ex.1017; ¶¶ 110, 112).
 - POSITA would look to such related procedures in devising a posterior sacroiliac fusion approach like that disclosed in the '129 patent with reasonable expectations of success. (Ex.1017; ¶110).

Motivation to Combine – What is not covered in the SI FUSION REFS?

Limitation 1(d) “introducing abrading device comprising”	introducing an abrading device into the working channel, the abrading device comprising:
Limitation 1(d)(i) “an abrading head”	an abrading head at a distal end of the abrading device, the abrading head having:
Limitation 1(d)(i)(a) “abrading surfaces”	abrading surfaces on each of a first pair of opposing sides, the abrading surfaces comprising one or more teeth, barbs, blades, ridges, slots, broaches, or other members capable of abrading a cortical bone of the sacroiliac joint; and
Limitation 1(d)(i)(b) “an open tip / cutting edge”	an open tip comprising a cutting edge disposed at a leading edge of the open tip, the cutting edge configured to cut bone tissue in the sacroiliac joint; and
Limitation 1(d)(i)(c) “a slide hammer / released position / locked position / releasing means”	II. a slide hammer assembly at a proximal end of the abrading device, the slide hammer assembly having a released position that enables operation of the slide hammer assembly, a locked position that prohibits operation of the slide hammer assembly, and a releasing means for transitioning the slide hammer assembly between the locked position and the released position; and
Limitation 1(e) “advancing the abrading device”	advancing the abrading device into the sacroiliac joint such that the open tip cuts bone tissue away from the sacrum or the ilium and the abrading surfaces decorticate the cortical bone inside the sacroiliac joint, thereby forming a decorticated implant void at the insertion point without using a rotary cutting instrument.

What’s left that is not covered in the SI Fusion Refs?
A locking mechanism that prevents operation of the slide hammer assembly when engaged, having a releasing mechanism.

FIGURE 1

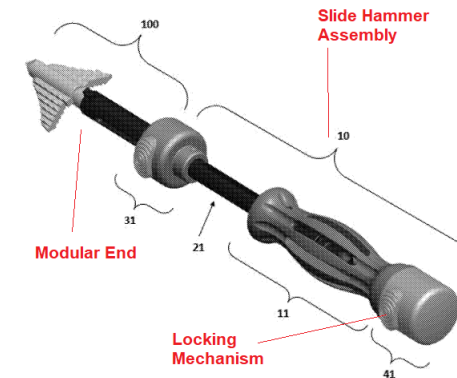
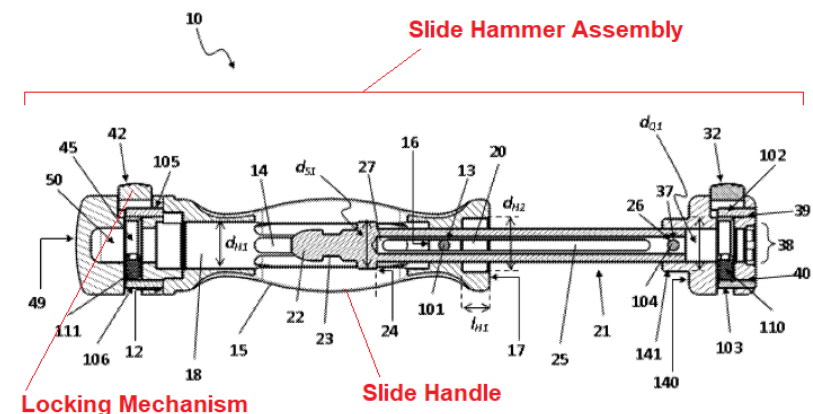


FIGURE 4



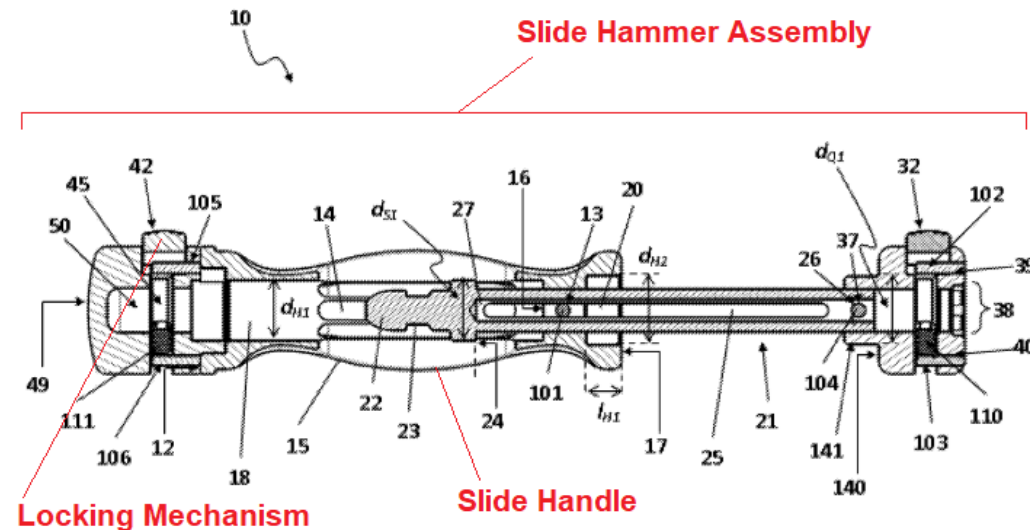
Motivation to Combine – Highly related and overlapping

- Sharma discloses a universal impactor with slap hammer device for use to assist in the impaction and/or extraction of a surgical instrument attached thereto, such as a chisel or rasp. (Petition, 48; Ex. 1009, Abstract; p. 19, ll. 15-18).
 - The slap hammer device of Sharma is designed for general use in orthopedic procedures. (Petition, 53; Ex. 1009, p. 3, ll. 1-3). The universal tool has a modular end that can connect to different types of instruments, including chisels and rasps during a surgical procedure. (Ex. 1009, p. 3, ll. 7-9). The universal impactor and slap hammer includes a locking mechanism that, when locked, allows the universal tool to function as an impact hammer and, when unlocked, allows the universal tool to act as a slap hammer. (Petition, 57; Ex. 1009, p. 3, ll. 1-3).
 - It would be obvious to use the universal impactor with slap hammer device of Sharma to assist in the impaction and/or extraction of attached surgical instruments in an SI Joint fusion procedure, such as chisels and rasps. (Petition, 53; Ex. 1017, ¶113). Compton discloses an orthopedic spinal procedure that includes the use of an impactor and tools that are conventionally used with hammers and slap hammers, such as a box chisel or rasp. (Petition, 53; Ex. 1004, 4:35-53, 5:1-44; Ex. 1017, ¶113).
 - It would be obvious to a POSITA that the universal impactor with a slap hammer device would be beneficially used with the tools (e.g., a box chisel or rasp) used in the SI FUSION REFS with predictable improvements in efficiency, particularly in view of the disclosure of the joint preparation tool of Donner. (Petition, 53; Ex. 1017, ¶113).

Motivation to Combine – Sharma universal impactor with slap hammer

- Sharma discloses a locking mechanism at the proximal end of central shaft 41 that locks the hammer sleeve 11 and impaction end 41 to the slap hammer shaft. (Ex. 1022, ¶40; Ex. 1009, 4:1-32, 20:6-25).

FIGURE 4

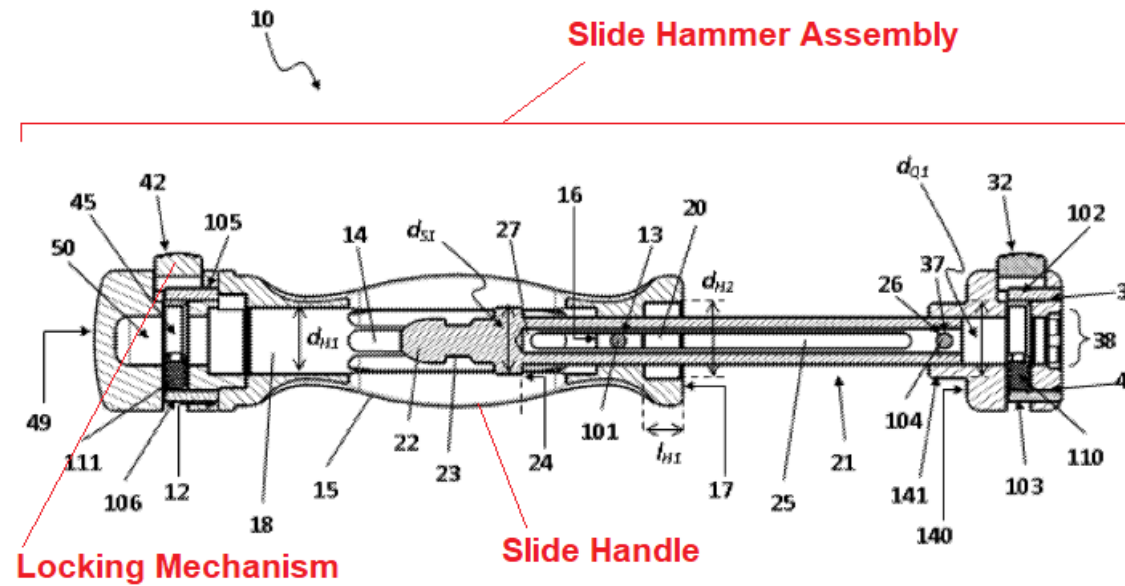


- This locking mechanism allows the tip of the central shaft to click into place and thereby turn the device into an impactor and a spring-loaded button 42 can be pressed to release the connection between the shaft and handle 11 to turn the device into a slide hammer. (Ex. 1022, ¶40; Ex. 1009, 20:6-17).

Motivation to Combine – Highly related and overlapping

- The structure that is released when button 42 is pressed is a proximal bullet shaped tip 22 that is adapted to mate to the integrated hollow cavity in hollow handle 11 to the proximal impaction end 41. (Ex. 1022, ¶40; Ex. 1009, 6:7-10).

FIGURE 4



- The locking mechanism allows the tip of the central shaft to click into place and thereby turn the device into an impactor and a spring-loaded button 42 can be pressed to release the connection between the shaft and handle 11 to turn the device into a slide hammer. (Ex. 1022, ¶40; Ex. 1009, 20:6-17).

Motivation to Combine – Highly related and overlapping

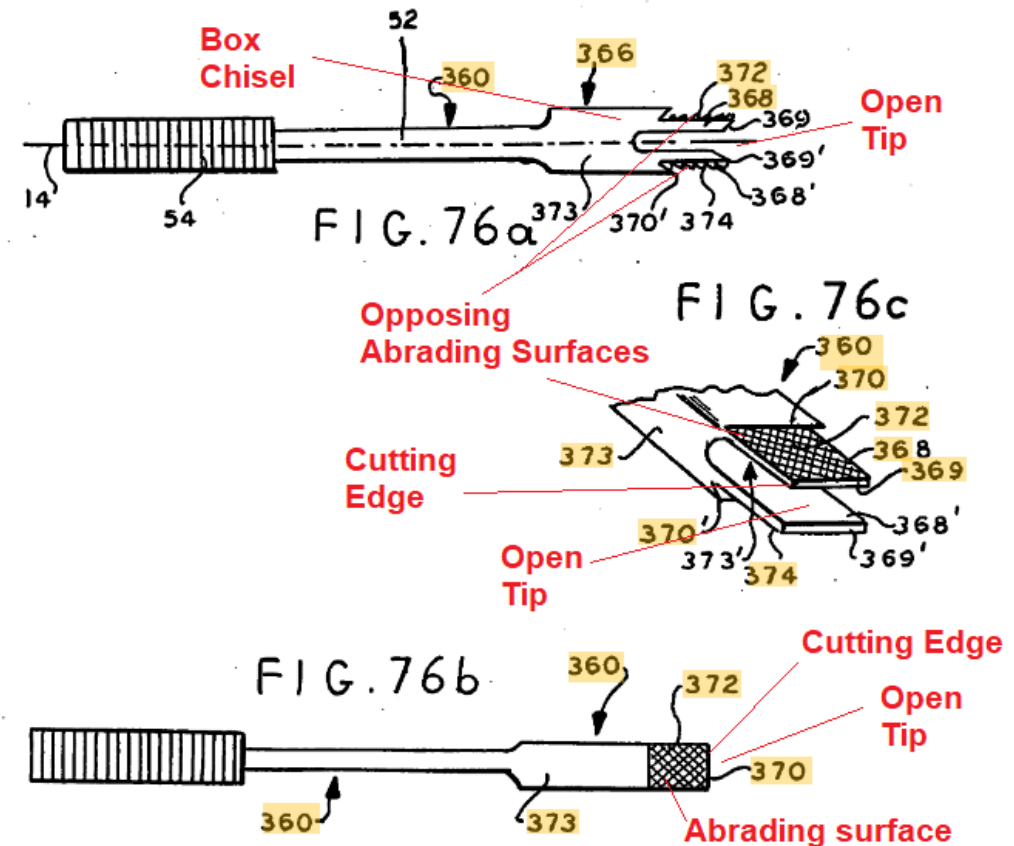
- Martz and Otte disclose methods and instruments from the same field (spinal orthopedic surgery), using highly similar instruments to accomplish similar functions (intervertebral fusion)
 - Spinal fusion surgeries are closely related to SI Joint fusion surgeries as they both deal with fusion of vertebral bones and both intervertebral fusion and SI Joint fusion surgeries involve preparing the joint space by clearing out the connective tissue, preparing the articular surfaces in the joint with chisels and rasps, and inserting a fusion implant between the prepared bone surfaces. (Petition, 63; Ex.1003, 19:40-20:2; Ex.1008, ¶¶[0093]-[0095]; Ex.1017, ¶133).
- There are many similarities of the function and structure of the sacro-iliac joint and intervertebral joints, and professionals in the field of spinal orthopedics have been adapting instruments traditionally utilized in spinal and intervertebral disc surgeries. (Ex.1017, ¶¶29-30). Both kinds of procedures involve weight-bearing spinal bones with large, substantially planar articular surfaces. (Ex.1017, ¶36).
- Adapting tools used in intervertebral disc fusions to SI joint fusions an obvious choice to a POSITA. (Ex.1017, ¶30). POSITA would look to such related procedures in devising a posterior sacroiliac fusion approach like that disclosed in the '129 patent with reasonable expectations of success. (Ex.1017; ¶110).

Motivation to Combine – Highly related and overlapping

- Sacroiliac joint and intervertebral joints, and professionals in the field of spinal orthopedics have been adapting instruments traditionally utilized in spinal and intervertebral disc surgeries. (Petition, 61; Ex.1017, ¶¶29-30).
 - Combinations of instruments and steps from the prior art cited in the Petition are nothing more than routine commonplace adaptations of well-known methods and instruments (e.g., cannulas, slide hammers, chisels, and rasps), guided by known anatomical attributes or constraints that achieve the same or similar functions in SI fusion procedures, and therefore yield safe and predictable results when used together. (Ex.1017, ¶¶36-37).
 - A combined box chisel and rasp accomplishes (1) shaping an implant void allowing for the insertion of a fusion implant and (2) decorticating the articular bone and filing the bone surface to induce bone repair in one operation, eliminating the time and effort needed to insert and extract a second tool and apply the tools separately in the SI Joint. (Petition, 62; Ex.1017, ¶134). Therefore, it would be obvious to a POSITA to utilize the box chisel, rasp combination tool of Martz (or Otte) in the SI fusion method of e.g., Schifano in substitution for separate box chisel and rasp. (*Ibid.*).

Martz – Cutting bone tissue

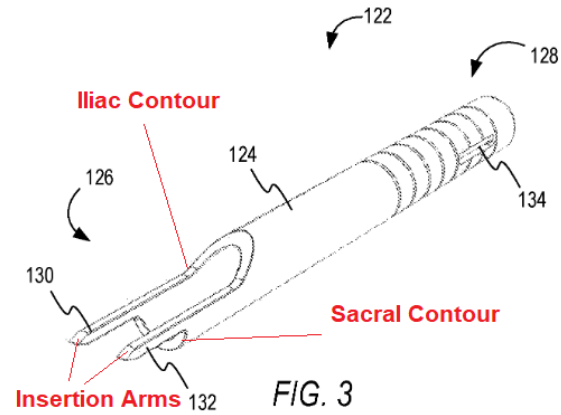
- Spinal fusion surgeries are closely related to SI Joint fusion surgeries as they both deal with fusion of vertebral bones and both intervertebral fusion and SI Joint fusion surgeries involve preparing the joint space by clearing out the connective tissue, preparing the articular surfaces in the joint with chisels and rasps, and inserting a fusion implant between the prepared bone surfaces. (Petition, 61; Ex.1003, 19:40-20:2; Ex.1008, ¶¶[0093]-[0095]; Ex.1017, ¶133).
- PO asserts that Martz does not disclose leading cutting edges at an open tip that cut bone tissue. (Ex. 2005, ¶47). This position assumes that a POSITA can only imagine applying the chisel of Martz shown in Figures 76a-76c in the exact form shown in the drawings. (Ex. 1022, ¶62).
- A POSITA would understand that the goal of a SI fusion procedure is fuse and heal the sacrum and ilium together and that this is achieved by removing the cartilage and cortical bone and decorticating the bone along surfaces of the sacroiliac joint. (Ex. 1022, ¶62).



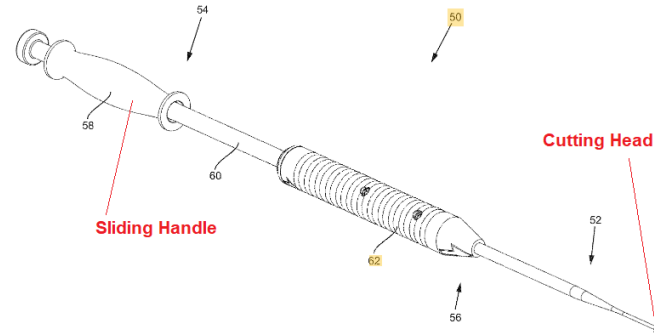
Ground 1

1	1, 2, 9-10	§103	US10,219,841 (Compton) [Ex.1004] in view of US2018/0036017 (Donner) [Ex.1006] US2005/0080422 (Otte) [Ex.1007] WO2014091454 (Sharma) [Ex.1009]
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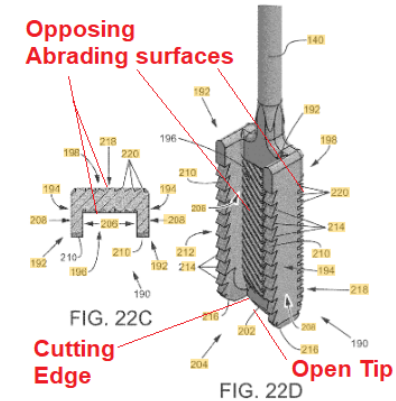
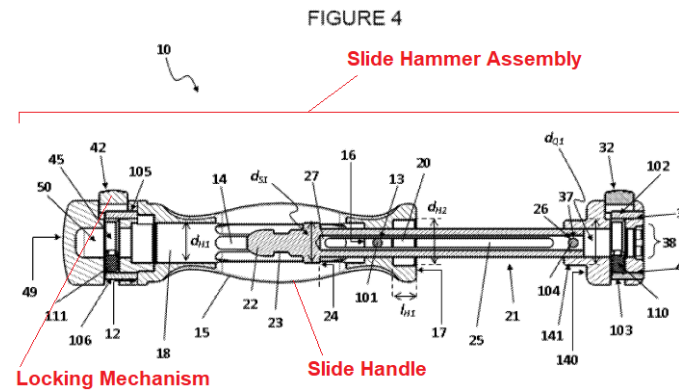
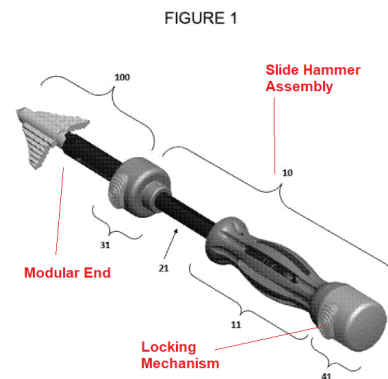
Compton



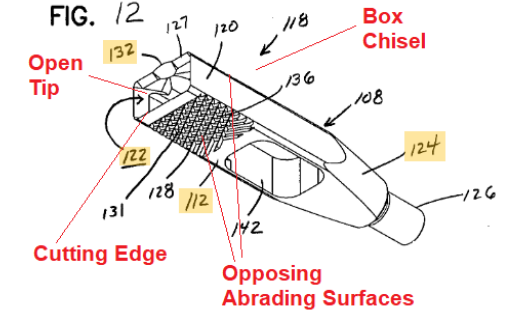
Donner



Sharma



Otte



Ground 5

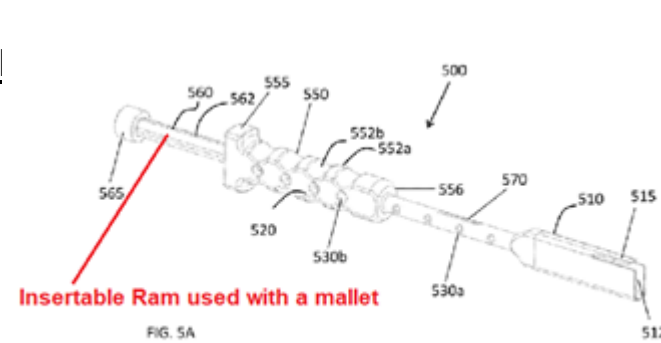
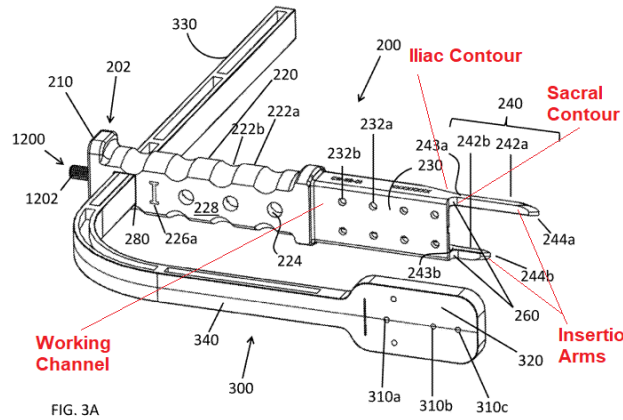
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1, 2, 9-10

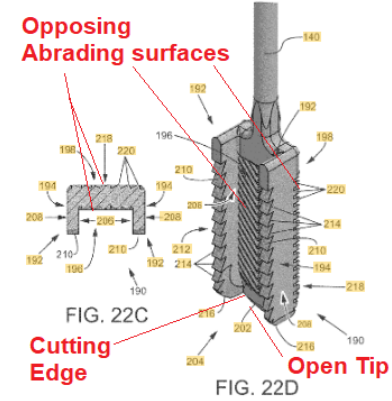
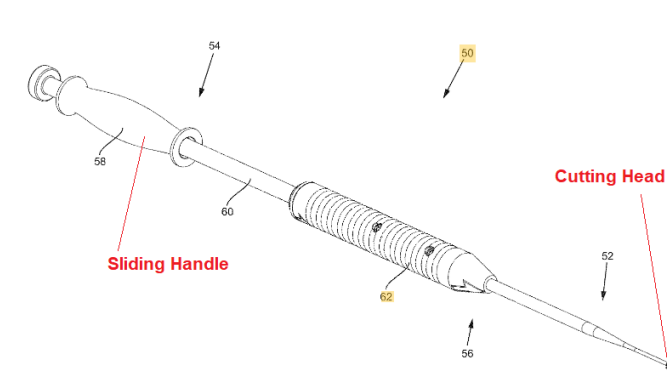
§103

US2016/0310197 (Black) [Ex.1005] in view of
US2018/0036017 (Donner) [Ex.1006]
US2005/0090829 (Martz) [Ex.1008]
WO2014091454 (Sharma) [Ex.1009]

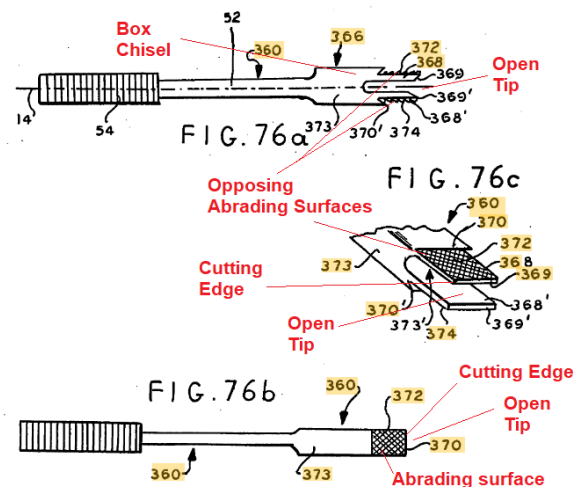
Black



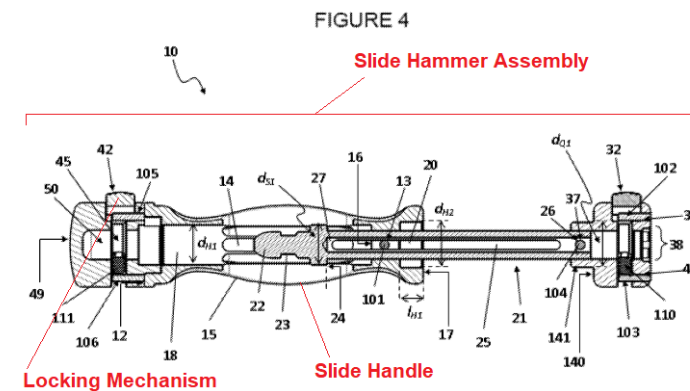
Donner



Martz



Sharma



DEMONSTRATIVE EXHIBIT - NOT EVIDENCE