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(54) **FIXATION PLATE FOR USE IN THE LAPIDUS APPROACH**

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(51) **Int. Cl.**
A61B 17/80 (2006.01)

(52) **U.S. Cl.**
CPC ***A61B 17/8061*** (2013.01); ***A61B 17/8085*** (2013.01); *Y10S 606/906* (2013.01)

(58) **Field of Classification Search**
CPC A61B 17/8061; A61B 17/8085; Y10S 606/906; Y10S 606/902
See application file for complete search history.

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(57) **ABSTRACT**

The present disclosure generally relates to fixation plates for use in correcting Hallux Valgus deformities under the Lapidus approach. The plate includes holes defined therethrough in such a way to facilitate multiplanar stability across the metatarsocuneiform joint. The plate is further sized and shaped to approximate the natural anatomic contour of the bone segments surrounding the metatarsocuneiform joint. Related methods for using the Lapidus approach to correct Hallux Valgus deformities are also described.

7 Claims, 8 Drawing Sheets

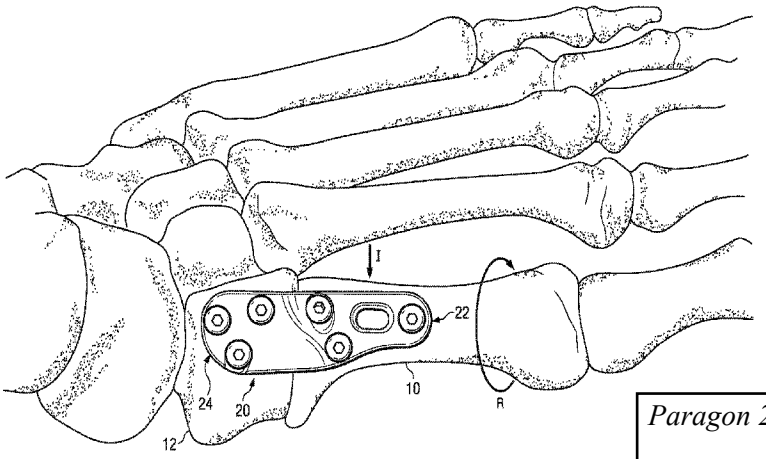

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FIG. 1A

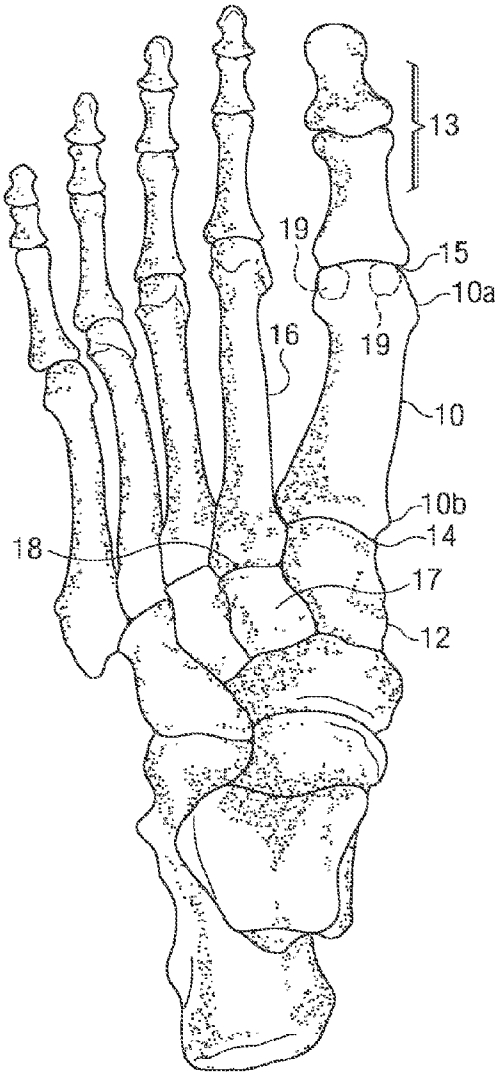
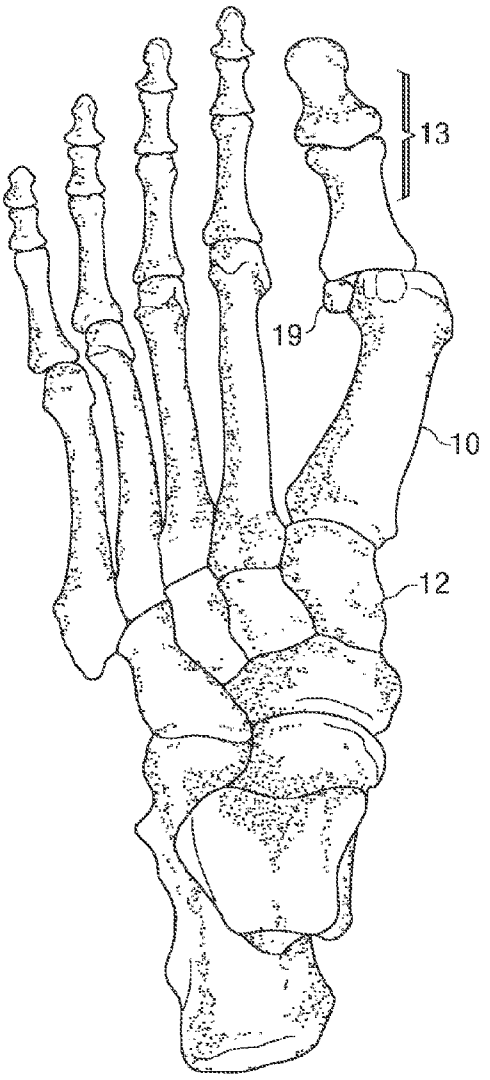


FIG. 1B



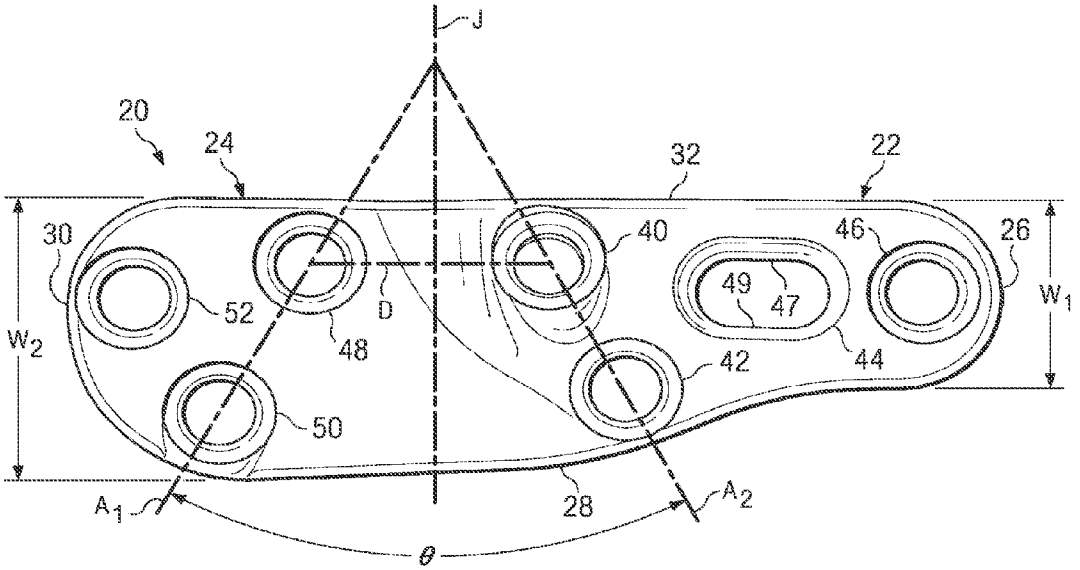

J
20
24
32
22
30
40
46
26
49
47
52
D
48
42
44
50
W_2
W_1
A_1
28
A_2
θ

FIG. 2

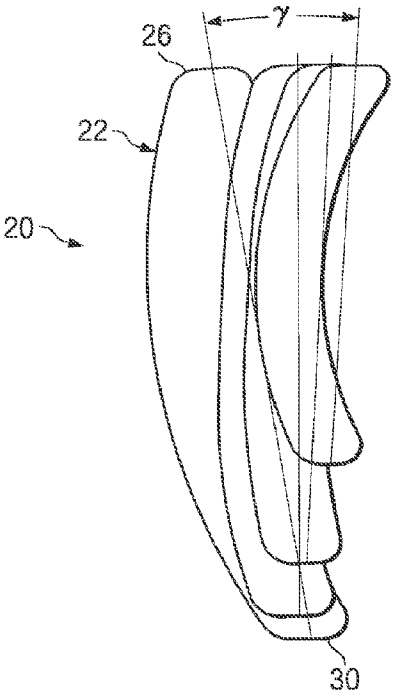

γ
26
22
20
30

FIG. 4

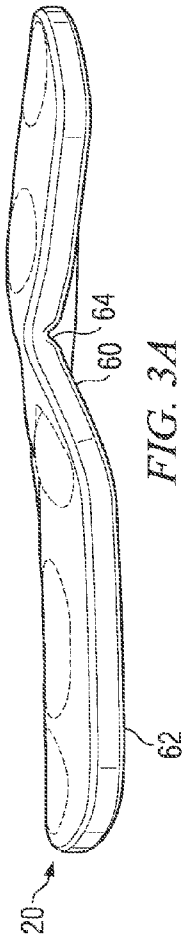


FIG. 3A

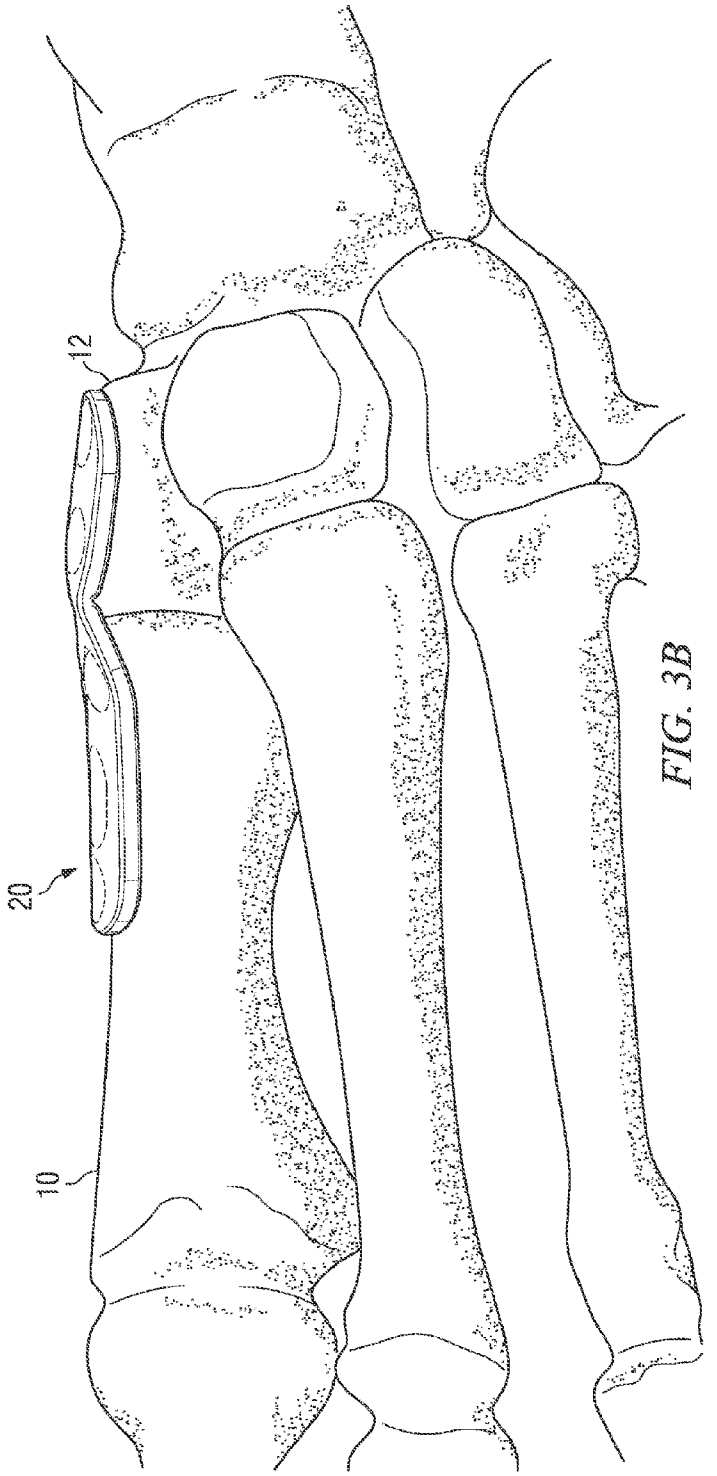


FIG. 3B

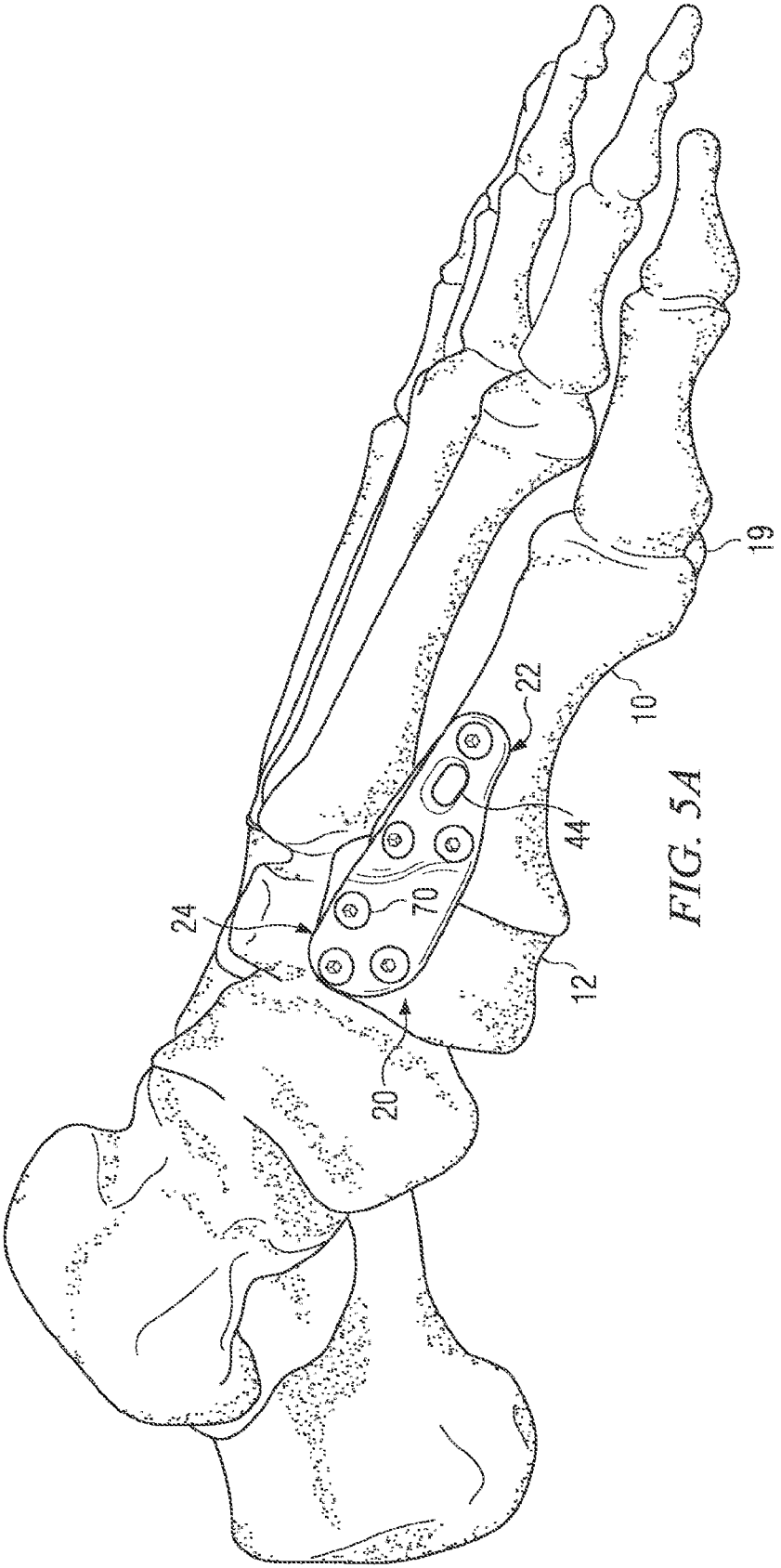


FIG. 5A

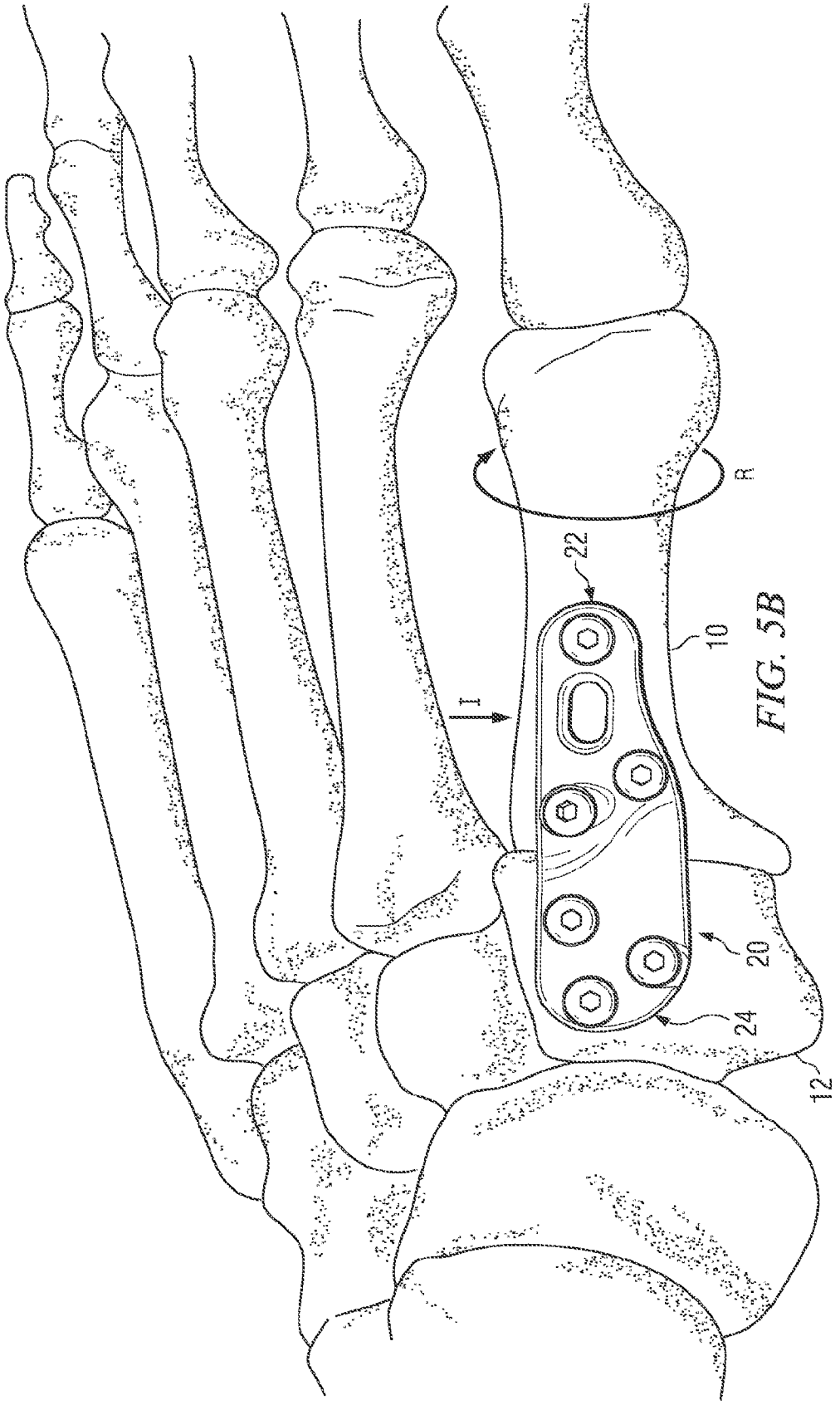


FIG. 5B

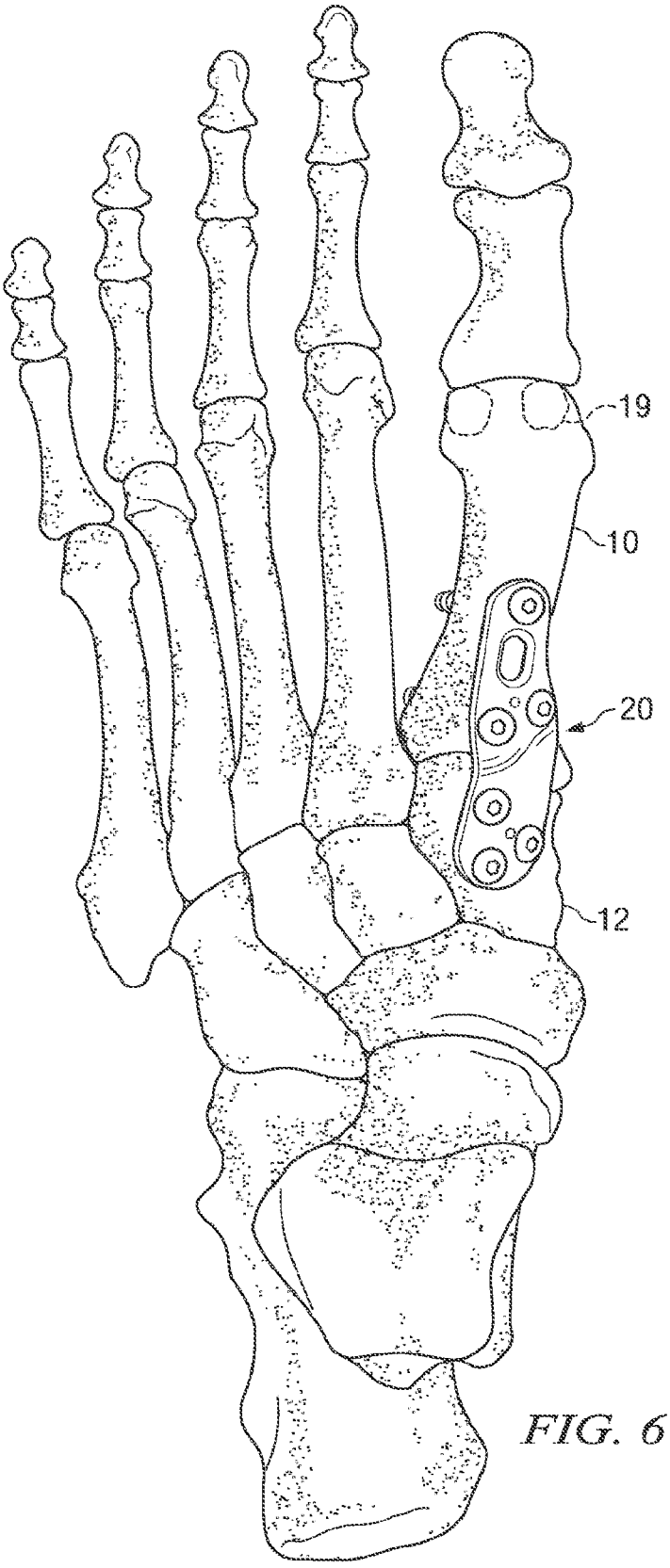


FIG. 6

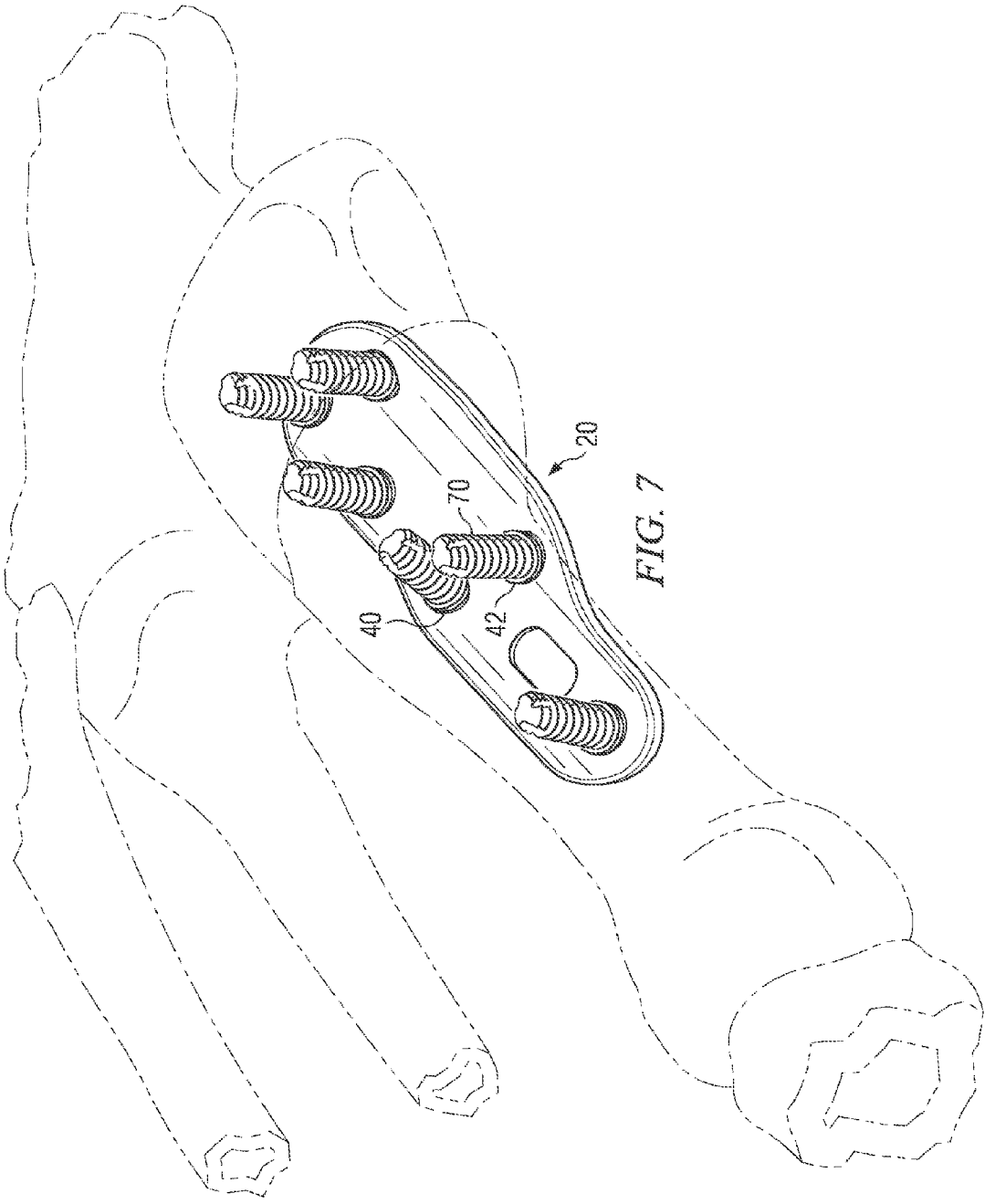


FIG. 7

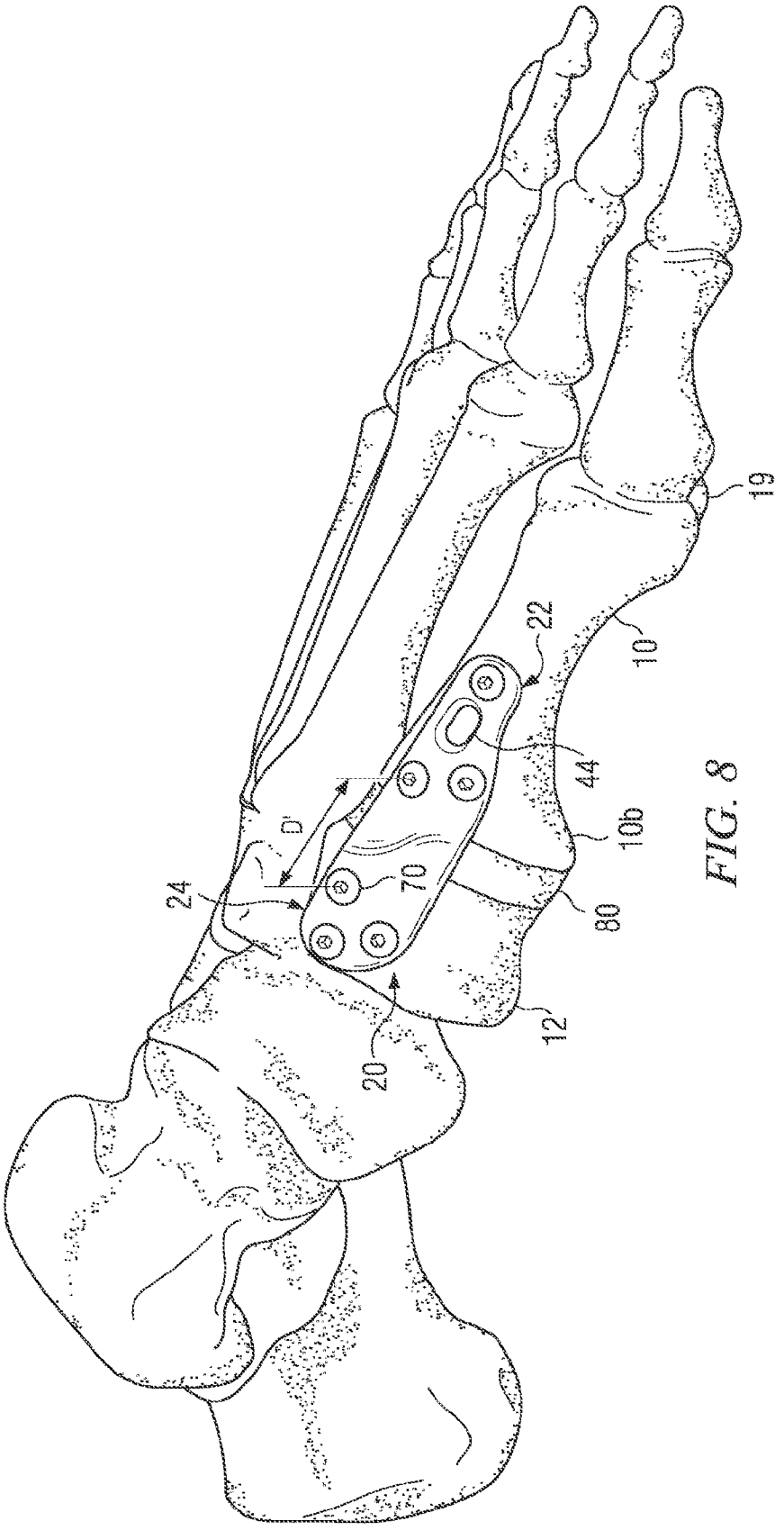


FIG. 8

FIXATION PLATE FOR USE IN THE LAPIDUS APPROACH

CROSS-REFERENCE TO RELATED APPLICATION(S)

This application is a continuation of U.S. application Ser. No. 12/274,199, filed on Nov. 19, 2008, which application is incorporated herein by reference in its entirety.

TECHNICAL FIELD

The present disclosure generally relates to medical devices for use in correcting foot deformities, and methods for surgically installing such devices and correcting such deformities.

BACKGROUND

Bunions have long been one of the more common types of painful foot deformities. The technical name for this type of deformity is Hallux Abducto Valgus (HAV), which is generally described as a medial deviation of the first metatarsal accompanied by a lateral deviation and/or valgus rotation of the hallux (or "big toe"). The result effect is a subluxation of the big toe joint (or first metatarsophalangeal joint (MTPJ)) creating a boney prominence (or eminence) on the inside of the foot, near the base of the big toe. FIG. **1**A illustrates the normal anatomical configuration of a left human foot, which includes the first metatarsal **10** that extends between the medial cuneiform **12** and the hallux **13**. The first metatarsal **10** articulates with the medial cuneiform **12** at the first metatarsocuneiform joint **14** at its most proximal aspect; and is further connected to the hallux **13** at the metatarsophalangeal joint **15** at its most distal aspect. Located adjacent (lateral) to the first metatarsal **10** is the second metatarsal **16**, which articulates with the intermediate cuneiform **17** at the second metatarsocuneiform joint **18**. The joint between the medial cuneiform **12** and intermediate cuneiform **17** is the intermetatarsocuneiform joint **18**. The sesamoids **19** are located beneath (plantar to) the first metatarsal head at the first MTPJ, and articulates with the head of the first metatarsal.

FIG. **1**B illustrates the resulting anatomical configuration of a human foot experiencing HAV. In particular, the first metatarsal **10** extends from the medial cuneiform **12** and deviates medially while the hallux **13** deviates laterally. As a result, the sesamoids **19** may rotate with the first metatarsal **10**. This condition may lead to painful motion of the big toe joint and/or difficulty fitting footwear. Other conditions associated with HAV may include: hammer toe formation of the adjacent toes, forefoot pain on the ball of the foot (aka metatarsalgia), stress fractures of the adjacent metatarsals, flat feet (pes planus), and arthritis of the first MTPJ or midfoot.

Bunions may occur from a variety of causes, such as genetic factors, gender influences, biomechanical and structural causes, trauma (injury), and certain shoes. Some physicians believe genetics play a large role in the development of bunions. Dudley Morton suggested that bunions may be a result of evolutionary influence, and described a certain foot type that is associated with bunions—the so called Morton's foot (a condition where the first metatarsal is shorter than the other metatarsals. See Morton D J. The Human Foot: Its evolution, Physiology and functional Disorders. Columbia University Press, Morningside Heights, N.Y., 1935. Some people develop bunions when associated with a condition called hypermobility, where the midfoot (i.e., metatarsocuneiform joint or "MCJ," illustrated in FIG. **1**A as the joint defined at the meeting of the metatarsal **10** and the cuneiform **12**) exhibits excessive motion. Less commonly, malshaped bones (hallux and/or first metatarsal) may give the appearance of and/or cause bunions. Many physicians attribute the progressive development of bunions to high heel and pointy toe shoes more commonly worn by women. It is well known that women are more likely to develop bunions than men.

Surgeons use weightbearing radiographs to determine the severity of HAV in an attempt to quantity the deformity, and aid in surgical decision making. The most commonly utilized radiographic measurement is the intermetatarsal angle (IMA), which measures the angle between a longitudinal bisection of the first and second metatarsal shafts. The IMA essentially measures the extent with which the first metatarsal has deviated (medially) from the second metatarsal. The normal value for the IMA is less than 8 degrees. Another useful radiographic measurement is the hallux abductus angle (HAA), which measures the amount of lateral deviation of the big toe (hallux). The HAA essentially measures the extent with which the hallux has deviated (laterally) from its native position (nearly rectus with the more proximal metatarsal). The normal value for the HAA is less than 12 degrees. A patient with a mild HAV deformity may have an IMA of 10-12 degrees and an HAA of 21-30 degrees. A patient with a moderate HAV deformity may have an IMA of 12-16 degrees and an HAA of 31-40 degrees. A patient with a severe HAV deformity may have an IMA of greater than 16 degrees and an HAA of greater than 40 degrees.

Various techniques have been developed to surgically correct HAV. The most basic technique simply involves resecting any enlarged bone at the medial aspect of the first metatarsal head, but this approach is typically used in conjunction with other more advanced techniques. A common technique involves an osteotomy (bone cut) procedure in which the first metatarsal is broken into two pieces and the distal portion of the bone is translated closer (medially) to the adjacent second metatarsal. The osteotomy may be performed at several locations on the first metatarsal, depending on the severity of the deformity. Less severe HAV deformities are typically corrected with an osteotomy near the head (**10***a* in FIG. **1**) of the first metatarsal, whereas moderate and larger deformities are corrected with an osteotomy near the base (**10***b* in FIG. **1**) of the first metatarsal. Whichever osteotomy technique is utilized, only the distal portion of the first metatarsal is relocated into a more lateral position while the proximal segment position remains unchanged. It should be understood that any osteotomy procedure reorients the first metatarsal by changing its shape from that of a straight bone to a more curved bone.

Alternative techniques have been developed that do not require breaking of the bone, or changing the natural shape of the first metatarsal. One such technique calls for fusion of the MCJ, wherein the entire first metatarsal is relocated into a corrected position. This approach was originally developed by Dr. Paul Lapidus, and hence this particular technique is often referred to as the Lapidus approach (or Lapidus Bunionectomy or Lapidus Arthrodesis or Modified Lapidus Bunionectomy/Arthrodesis). In some situations the procedure may involve an isolated fusion of the 1^{st} MCJ, and in other situations surgeons may also incorporate a fusion of the intermediate cueniform area and or 2^{nd} metatarsal base. In general, the idea behind the Lapidus approach is to permanently fuse the base of the first metatarsal to the medial cuneiform bone in a corrected new position. This permanent fixation is carried out by first reducing the IMA and then fusing the MCJ. Implementation of this approach often involves the use of a number of screws across the joint or a plate that can accommodate screws to attach the plate to the metatarsal and medial

cuneiform. In some cases, a fusion of the 1st MCJ that incorporates lengthening of the entire segment by adding bone graft (i.e., a block of bone) into the fusion site is better termed a distraction Lapidus.

BRIEF SUMMARY

The present disclosure generally relates to an improved fixation or "Lapidus" plate for use in treating HAV deformities or other conditions that may call for a fusion of this joint and possibly concomitant fusion incorporating the 2nd metatarsal base and/or intermediate cuneiform. The term "Lapidus" as used herein is only meant to be descriptive in terms of a suggested use for the plate and does not confer any structural limitations on the plate described herein. In one exemplary embodiment, the Lapidus plate is used for joint arthrodesis at the first MCJ. The Lapidus plate according to the present disclosure provides mechanical stability of the first metatarsal while also accommodating and assisting reorientation of the first metatarsal to correct the HAV deformity. In one embodiment, the plate is generally elongated and comprises a thin and rigid stabilizing member of biocompatible material. The orientation of the fixation plate offers multiplanar stability including the plantar aspects of the joint to resist tensile forces transmitted across the fusion site. The screw configuration of the plate can be maintained for several different sizes of the plate while still maintaining desired multiplanar stability. Also, the positioning of the screw holes are designed to avoid invasion of the fusion site by the screws that ultimately pass therethrough. Indeed, the screw angles are designed for the post-Lapidus position.

The Lapidus plate according to the present disclosure includes additional features that accommodate the desired reorientation of the first metatarsal during correction. For example, the Lapidus plate described herein includes a degree of twist along its longitudinal axis to follow the contour of the first metatarsal and medial cuneiform, thereby facilitating reorientation of the first metatarsal to its natural position. The Lapidus plate is further anatomically configured to include a recess, which accommodates the natural crests of the medial cuneiform and the first metatarsal. In this manner, the first metatarsal can be guided against the medial cuneiform and the plate such that the base of the first metatarsal fits within the recess. The recess thus facilitates a desired location and orientation of the first metatarsal that approximates its natural position. In this manner, the Lapidus plate according to the present disclosure accommodates the final position of the fusion of the MCJ. The fixation plate is anatomically configured to provide rigid support of the realigned MCJ fusion site while positioning screws to avoid invasion into the fusion site thus achieving desired stability. It is to be appreciated that the plate described herein can be adapted for use on both right and left feet with a right foot plate being a mirror-image of a left foot plate.

A surgical method for preparing the MCJ for receipt of the Lapidus plate and subsequently implanting the plate is further described. In patients with HAV, surgical procedures may be concomitantly performed near the first metatarsal head. A capsular release of the first MTPJ and resection of the medial eminence, if present, is often performed in conjunction with release of the adductor tendon and lateral sesamoidal ligament. Next, all cartilage is removed from the first MCJ with either a reciprocal saw and/or manual resection. Removal of the cartilage is preferred to allow for bone on bone contact to allow for a fusion between the medial cuneiform and first metatarsal. The first metatarsal is then repositioned back to its native position (IMA as close to zero as possible). However, in order to compensate for the shortening that occurs with removal of the cartilage of the first MCJ, the first metatarsal must be translated inferiorly and/or angulated inferiorly (plantarflexed) to restore the weightbearing mechanics of the first metatarsal head at the ball of the foot. Lastly, the fusion site is stabilized with the fixation plate described herein. In some embodiments, the plate is placed on the dorsal medial surface of the segment to avoid contact with muscular attachments.

BRIEF DESCRIPTION OF THE DRAWINGS

Reference is now made to the following descriptions taken in conjunction with the accompanying drawings.

FIG. **1**A illustrates a top view of a human foot;

FIG. **1**B illustrates a top view of a human foot experiencing the condition of Hallux Valgus;

FIG. **2** illustrates a top view of a fixation plate according to one embodiment of the present disclosure;

FIG. **3**A illustrates a side view of the fixation plate of FIG. **2**;

FIG. **3**B illustrates a side view of the fixation plate of FIG. **2** positioned adjacent to the MCJ;

FIG. **4** illustrates a schematic view depicting the gradual twist of the fixation plate of FIG. **2**;

FIG. **5**A illustrates a perspective view of the fixation plate of FIG. **2** positioned against the medial cuneiform and first metatarsal;

FIG. **5**B illustrates another perspective view of the fixation plate of FIG. **2** positioned against the medial cuneiform and first metatarsal;

FIG. **6** illustrates a top view of the fixation plate of FIG. **2** affixed to the medial cuneiform and first metatarsal;

FIG. **7** is a bottom perspective view of the fixation plate of FIG. **6** showing the orientation of the screws; and

FIG. **8** is a perspective view of another embodiment of the fixation plate wherein the plate is a distraction plate.

DETAILED DESCRIPTION

Various aspects of a Lapidus plate and methods of using same according to the present disclosure are described. It is to be understood, however, that the following explanation is merely exemplary in describing the devices and methods of the present disclosure. Accordingly, several modifications, changes and substitutions are contemplated.

A Lapidus plate **20** for a human left foot according to the present disclosure is illustrated in FIG. **2**. It is to be appreciated that a Lapidus plate according to the present disclosure for a human right foot would be substantially similar to and have a mirror image configuration of the plate **20** illustrated in FIG. **2**. The plate **20** generally comprises a distal portion **22** for attachment to a metatarsal and a proximal portion **24** for attachment to a cuneiform. For purposes of illustration only, the distal and proximal portions **22**, **24** are divided along a joint axis (J) generally corresponding to the fusion site (i.e., the interface between the cuneiform and metatarsal) as will be described. In one exemplary embodiment, the metatarsal is the first metatarsal **10** (FIG. **1**) and the cuneiform is the medial cuneiform (FIG. **1**). The plate **20** is sized and shaped to conform to the anatomical contours of the first MCJ and as such the distal portion **22** includes a relatively narrow and rounded end portion **26**. The distal portion gradually increases in width along a first side **28** of the plate towards the proximal portion **24**. The proximal portion **24** includes a slight gradual increase in width along the first side **28** of the plate **20** culminating in a rounded end portion **30** that is larger

in width than the end portion **26** of the proximal portion **22**. The plate **20** further includes a substantially linear second side **32** opposite the first side **28**.

The plate is configured and designed to avoid tendon and minimize soft tissue irritation, while also providing for optimal rigidity and stability. As such, in some embodiments, the end portion **26** of the distal portion **22** has an anatomically optimal width W_1 in the range of 10.5+/−3 mm, while the end portion **30** of the proximal portion **24** has an anatomically optimal width W_2 in the range of 16+/−4 mm. In some embodiments, the plate has a varying thickness of between 0.75 mm and 3.0 mm, thus minimizing tissue irritation. Moreover, the edges of the plate may be tapered. In one embodiment, the Lapidus plate according to the present disclosure is sized and shaped for placement in a "safe zone" of the area to be treated; that is, the place on the dorsal medial surface of the first metatarsal and medial cuneiform that is devoid of tendon attachments. It is to be appreciated that the Lapidus plate according to the present disclosure may have a configuration different than that described herein so long as the plate accommodates the contours of the particular anatomical region being treated.

The distal and proximal portions **22**, **24** of the plate **20** each include a plurality of screw holes formed therethrough to facilitate attachment of the plate to the respective metatarsal and cuneiform. In one embodiment, the distal portion **22** includes four screw holes formed through the plate **20** with two holes **40**, **42** being positioned in proximity to the joint axis J and the remaining two holes **44**, **46** being positioned distal of holes **40**, **42**. In some embodiments, the holes **40**, **42** and **46** are countersunk and threaded to accommodate screws having threaded heads as will be described. Hole **40** is positioned adjacent to the second side **32** and the joint axis J while hole **42** is positioned distal of hole **40** and closer to side **28** of the plate **20**. Hole **44** is positioned distally of holes **40**, **42** and is generally elongated to accommodate movement of the plate **20** as will be described. The elongated nature of hole **44** defines a pair of substantially parallel sides **47**, **49**, which are substantially parallel to second side **32** of the plate **20**. Hole **46** is positioned distal of hole **44** and also accommodates a screw (not shown) to assist with fixation of the plate **20** to the metatarsal. The location of hole **46** assists with distributing weight away from the fusion site.

Similar to the distal portion **22** of the plate **20**, the proximal portion **24** includes a plurality of screw holes to accommodate fixation. In one embodiment, the proximal portion **24** of the plate **20** includes three holes **48**, **50** and **52** formed therethrough. In some embodiments, the holes **48**, **50** and **52** are countersunk and threaded to accommodate screws having threaded heads as will be described. Hole **48** generally corresponds to hole **40** of the metatarsal portion, and as such, is positioned adjacent to the second side **32** and the joint axis J. Hole **50** generally corresponds to hole **42** of the metatarsal portion, and as such, is positioned proximal of hole **48** and closer to side **28** of the plate **20**. Hole **52** is positioned proximal of holes **48**, **50** and accommodates a screw (not shown) to assist with fixation of the plate **20** to the cuneiform bone. The location of hole **52** assists with distributing weight away from the fusion site.

In one embodiment, the holes **40**, **42** of the distal portion **22** and the holes **48**, **50** of the proximal portion are designed to assist with screw fixation into the widest part of both bone segments while maintaining a safe distance from the fusion site such that the screws that ultimately pass through such holes do not penetrate the fusion site. In this regard, the holes **40**, **42**, **48** and **50** form a substantially trapezoidal shape, which facilitates the even distribution of load across the MCJ. It is to be appreciated that the arrangement of holes **40**, **42**, **48** and **50** may not form an exact trapezoid. For example, the line defined from the centerpoint of hole **40** to the centerpoint of hole **48** and the line defined from the centerpoint of hole **42** to the centerpoint of hole **50** may not be perfectly parallel. Rather, such lines may be only substantially parallel and thus the arrangement of holes **40**, **42**, **48** and **50** may form a substantially trapezoidal shape rather than a true trapezoidal shape. The substantially trapezoidal arrangement of the holes **40**, **42**, **48** and **50** define an angle θ measured between the nonparallel sides of the trapezoid (i.e., between the lines A_1 and A_2 shown for purposes of illustration in FIG. **2**). Also, the distance between the dorsal screw holes **40**, **48** is measured by the distance D. In some embodiments, the angle θ is optimally 57+/−15 degrees and the distance between the dorsal screws **40**, **48** is optimally 12+/−4 mm.

Referring to FIGS. **3**A and **3**B, the plate **20** according to the present disclosure further includes a recess **60** defined along a bone-contacting surface **62** of the plate. The recess **60** is generally defined at and adjacent to the joint axis J of the plate **20**. In this manner, the plate **20** is designed to accommodate the crests of the first metatarsal **10** and medial cuneiform **12** upon placement of the plate against the MCJ as illustrated in FIG. **3**B. In some embodiments, a channel **64** is formed laterally in the bone-contacting side of the plate **20** in a region generally corresponding to the recess **60** to facilitate additional flexibility at the fusion site along the joint axis J (FIG. **2**). This flexibility assists the surgeon with bending of the plate **20** to achieve the desired final position of the plate at the fusion site.

In some HAV deformities, the first metatarsal experiences a lateral twist. As a result, the sesamoid bones are no longer in contact with the surface and are thus not able to carry most of the body load transferred through the forefoot during motion. This results in an extra load being placed on other adjacent metatarsals, thus increasing the possibility for metatarsalgia, or possibly stress fractures in those metatarsals. To correct this disorientation, in some embodiments, the plate **20** according to the present disclosure includes a degree of twist along its longitudinal axis (i.e., from end portion **30** to end portion **26** as shown in FIG. **2**). Referring to FIG. **4**, the plate **20** has a gradual twist γ from proximal portion **24** to distal portion **22**. In some embodiments, the anatomically optimal twist is 12+/−6 degrees measured along the longitudinal axis of the plate **20** defined from end portion **30** to end portion **26**.

In practice, the first MCJ is prepared for plate implantation by first performing a capsulotomy of the ligaments surrounding the first MCJ and then removing cartilage within this joint. Referring to FIGS. **5**A, **5**B and **6**, the proximal portion **24** of the plate **20** is placed against the medial cuneiform **12** and attached thereto using screws **70** having threaded heads and threaded shafts. The threaded heads of the screws **70** thread into the corresponding countersunk threaded holes **48**, **50** and **52** (FIG. **2**) such that the screws are fixed relative to the plate **20**. It is to be appreciated that in some embodiments, the screws may have non-threaded heads such that the screws are not locked into place relative to the plate **20**. Upon attachment of the plate **20** to the medial cuneiform **12**, the first metatarsal **10** is translated inferiorly in the direction I as illustrated in FIG. **5**B to maintain a natural distribution of ground force over all the foot's sesamoid bones to avoid stress fracture or even breakage of the other four metatarsals. In some embodiments, the optimal amount of translation D_I is 3+/−3 mm to accommodate for the shortening that occurs when cartilage is removed from the joint. The first metatarsal **10** is also translated laterally and rotated in the direction R to return the metatarsal to its approximate natural anatomic orientation to

reduce the intermetatarsal angle. The plate **20** according to the present disclosure is designed for placement against the medial cuneiform and first metatarsal in an area devoid of muscular and tendinous attachments.

Upon proper positioning of the first metatarsal **10**, a screw (not shown) is placed through the elongated hole **44** and into the metatarsal with the elongation permitting movement of the bone. In some embodiments, the MCJ may be temporarily fixated in a corrected position using a k-wire. Also, the plate **20** may include k-wire holes such that k-wires can be used in conjunction with the plate to stabilize the first metatarsal for screw implantation. Upon stabilization, the first metatarsal **10** is then moved toward the medial cuneiform **12** whereupon the screw positioned through elongated hole **44** is tightened to compress the first MCJ. Once compression is achieved, the distal portion **22** of the plate **20** is further attached to the metatarsal using threaded screws **70** having threaded heads that are placed through screw holes **40**, **42** and **46** (FIG. **2**) and into the bone. The threaded heads of the screws **70** thread into the corresponding countersunk threaded holes **40**, **42** and **46** such that the screws are fixed relative to the plate **20**. It is to be appreciated that in some embodiments, the screws may have non-threaded heads such that the screws are not locked into place relative to the plate **20**. Once the plate is fixed to the medial cuneiform **12** and the first metatarsal **10**, the screw passing through elongated hole **44** may be removed.

Referring to FIG. **7**, the twist of the plate **20** along its longitudinal axis facilitates desired orientation of the screws into the metatarsal. More specifically, holes **40** and **42** are angled toward one another such that implantation of the screws **70** through these holes results in their axes crossing one another in a divergent manner. This, in turn, provides for optimal orientation of the screws **70** in the first metatarsal **10** to achieve desired stability.

A variation of the Lapidus plate according to the present disclosure involves providing for distraction (or lengthening) at the fusion site. As illustrated in FIG. **8**, this allows for bone graft **80** to be interposed between the 1st metatarsal base **10***b* and the medial cuneiform **12**, when the clinical situation arises. Providing for distraction at the fusion site maintains that the screw holes **40** and **42** purchase the 1st metatarsal base **10***b*, for which these holes are configured to provide maximal stability at the fusion site. The amount of distraction D' most commonly required is between 1 mm-25 mm, with the distraction plate accommodating this length. It is to be appreciated, however, that other distraction lengths may be accommodated by the plate **20** of the present disclosure. In some embodiments, the plate **20** may add length by providing additional screw holes formed in distal portion **22** of the plate **20**. In some embodiments, fixation of the plate may occur via a screw passing through the fusion site into the intermediate cuneiform and/or second metatarsal.

The Lapidus plate **20** described herein and associated method of implantation leads to fusion of the MCJ, which provides for mechanical stability of the first metatarsal and medial cuneiform and the reorientation to compensate for an HAV deformity. The orientation of the fixation achieved according to the principles of the present disclosure offers multiplanar stability including the plantar aspects of the MCJ to resist tensile forces across the fusion site. The screw configuration described herein can thus be maintained for several different sizes of distraction Lapidus arthrodesis. That is, the screw configuration provides multiplanar stability as distraction length is added to the plate **20**.

While various embodiments of Lapidus plates and related methods of implanting such plates, have been described above, it should be understood that they have been presented by way of example only, and not limitation. Thus, the breadth and scope of the invention(s) should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents. Moreover, the above advantages and features are provided in described embodiments, but shall not limit the application of the claims to processes and structures accomplishing any or all of the above advantages.

Additionally, the section headings herein are provided for consistency with the suggestions under 37 CFR 1.77 or otherwise to provide organizational cues. These headings shall not limit or characterize the invention(s) set out in any claims that may issue from this disclosure. Specifically and by way of example, although the headings refer to a "Technical Field," the claims should not be limited by the language chosen under this heading to describe the so-called technical field. Further, a description of a technology in the "Background" is not to be construed as an admission that technology is prior art to any invention(s) in this disclosure. Neither is the "Brief Summary" to be considered as a characterization of the invention(s) set forth in the claims found herein. Furthermore, any reference in this disclosure to "invention" in the singular should not be used to argue that there is only a single point of novelty claimed in this disclosure. Multiple inventions may be set forth according to the limitations of the multiple claims associated with this disclosure, and the claims accordingly define the invention(s), and their equivalents, that are protected thereby. In all instances, the scope of the claims shall be considered on their own merits in light of the specification, but should not be constrained by the headings set forth herein.

What is claimed is:

1. A method for fusing a metatarsocuneiform joint, comprising:

positioning a fixation plate adjacent to a medial cuneiform, the plate having proximal and distal portions divided along a joint axis, the joint axis corresponding to the metatarsocuneiform joint and the plate further having a recess defined along a bone-contacting surface thereof,

securing the plate to the cuneiform using three screws triangularly oriented through the plate;

laterally and inferiorly translating and rotating a metatarsal such that an end of the metatarsal abuts the cuneiform and fits into the recess defined by the plate; and

securing the plate to the metatarsal using three screws triangularly oriented through the plate.

2. A method according to claim **1**, wherein the metatarsal is inferiorly translated a distance of 3+/−3 mm.

3. A method according to claim **1**, further comprising the step of compressing the metatarsocuneiform joint before securing the plate to the metatarsal.

4. A method according to claim **1**, wherein the plate has a gradual twist from the proximal portion to the distal portion to match the contour of the metatarsal after rotation of the metatarsal.

5. A method according to claim **1**, further comprising the step of securing the plate to a second metatarsal.

6. A method according to claim **1**, further comprising the step of securing the plate to an intermediate cuneiform.

7. A method according to claim **1**, wherein the fixation plate is designed for placement against an area of the medial cuneiform and first metatarsal that is devoid of muscular or tendinous attachments.

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