

# Method for fabricating micron-scale stepped needles intended for the insertion of devices

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## INVENTION NOVELTY

This invention is a novel method for fabricating needles with stepped ends. The method uses a brazing technique to achieve a fine stepped needle meant for delivering probes into tissue. This method creates needles strong enough to be used in neural surgery, but thin enough (<15 um) to create a very minimal entry wound.

## VALUE PROPOSITION

The current methods used for fabricating needles such as etching, laser ablation and micromachining create larger gauge needles. This approach introduces a method to decrease the size of the needle while maintaining the strength needs to handle the force of insertion into tissue including that of the CNS or other nervous tissue. This is the first method for creating fine stepped needles required device insertion, which can be used for monitoring or treatment.

This novel invention provides the following advantages:

- ▶ This method enables fabrication of **very fine stepped** needles compared to other methods such as etching (25 um), laser ablation, micromachining (50 um).
- ▶ Needles can be fabricated with a **wide range of sizes** and **materials**.
- ▶ **Small wound** diameters.
- ▶ **Increases support** for a **needle  $\leq 15$  um**, normally susceptible to buckling.

## TECHNOLOGY DESCRIPTION

Scientists from University of California, San Francisco Department of Physiology have identified a novel needle fabrication method that creates fine stepped needles strong enough to implement the sewing machine method for neural implantation. This fabrication involves multiple smaller needles being wound around one another and joined through a process called brazing. The final product is thickened along its length with blunted pieces of supporting metal so that the very narrow, sharpened metal (fine stepped needle) intended for entry into tissue can absorb the force being applied. A variety of application and filler metals can be used to fabricate needles for different uses.

## APPLICATION

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### OTHER INFORMATION

#### CATEGORIZED AS

▶ **Medical**

▶ **Devices**

#### RELATED CASES

2017-074-0

Insertion of fine neural probes for

- Chronic recording (needle electrode combination)

- Chronic electrical stimulation (needle electrode combination)

## LOOKING FOR PARTNERS

To commercialize this technology

## STAGE OF DEVELOPMENT

Preclinical

## DATA AVAILABILITY

Under NDA/CDA

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,201,453	01/21/2025	2017-074
Germany	Issued Patent	3547928	04/10/2024	2017-074
France	Issued Patent	3547928	04/10/2024	2017-074
United Kingdom	Issued Patent	3547928	04/10/2024	2017-074
United States Of America	Issued Patent	11,857,343	01/02/2024	2017-074
Canada	Published Application			2017-074

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