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(12) **United States Patent**
**Edelsbrunner et al.**

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(54) **METHODS OF GENERATING THREE-DIMENSIONAL DIGITAL MODELS OF OBJECTS BY WRAPPING POINT CLOUD DATA POINTS**

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(51) **Int. Cl.**[7] ................................................ **G06F 19/00**

(52) **U.S. Cl.** .............................. **700/98**; 703/2; 345/419

(58) **Field of Search** ............................ 700/98, 97, 117, 700/118, 119, 120, 182; 345/419, 420; 703/2

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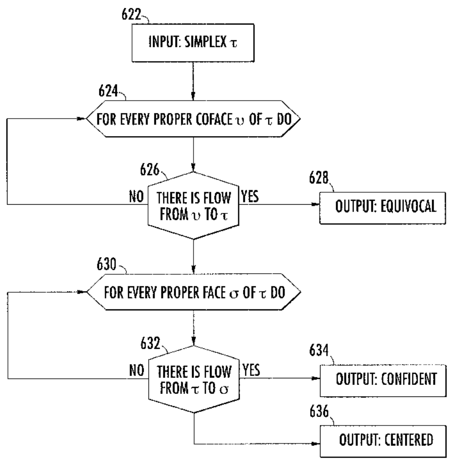
(57) **ABSTRACT**

A method of automatic conversion of a physical object into a three-dimensional digital model. The method acquires a set of measured data points on the surface of a physical model. From the measured data points, the method reconstructs a digital model of the physical object using a Delaunay complex of the points, a flow strcuture of the simplicies in the Delaunay complex and retracting the Delaunay complex into a digital model of the physical object using the flow structure. The method then outputs the digital model of the physical object.

**30 Claims, 19 Drawing Sheets**

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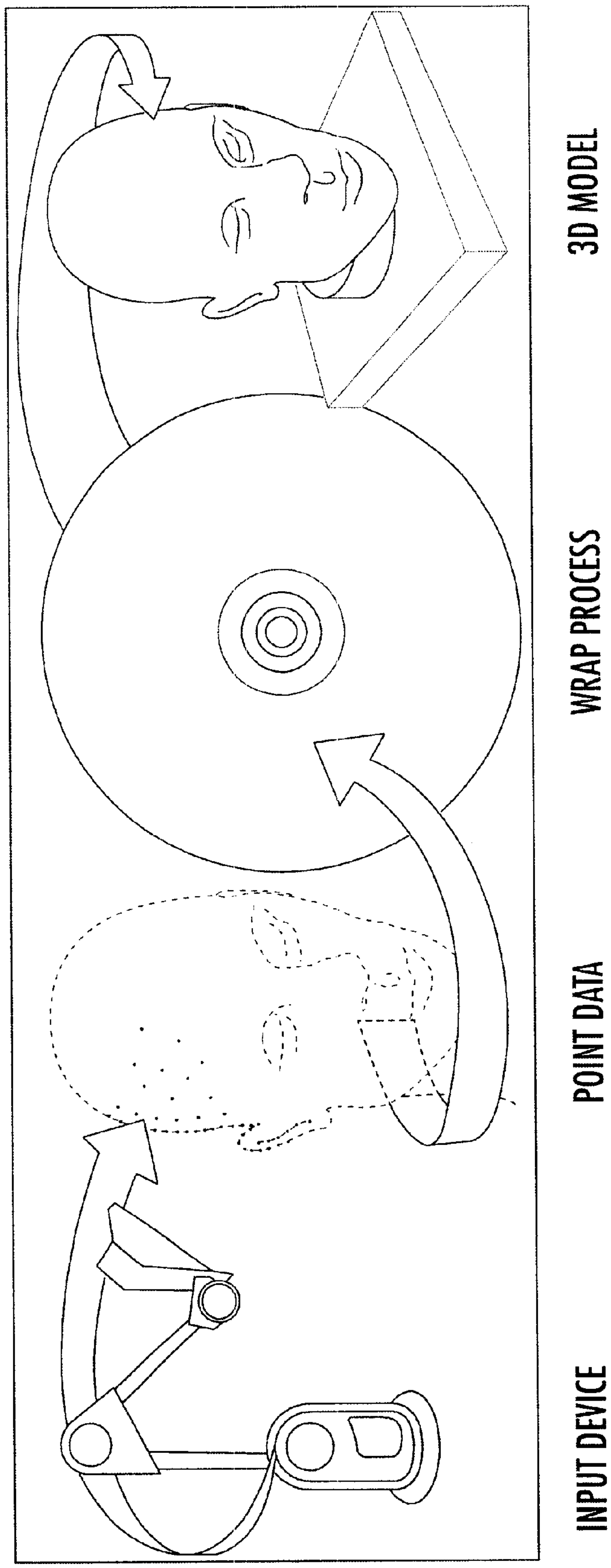


FIG. 1.

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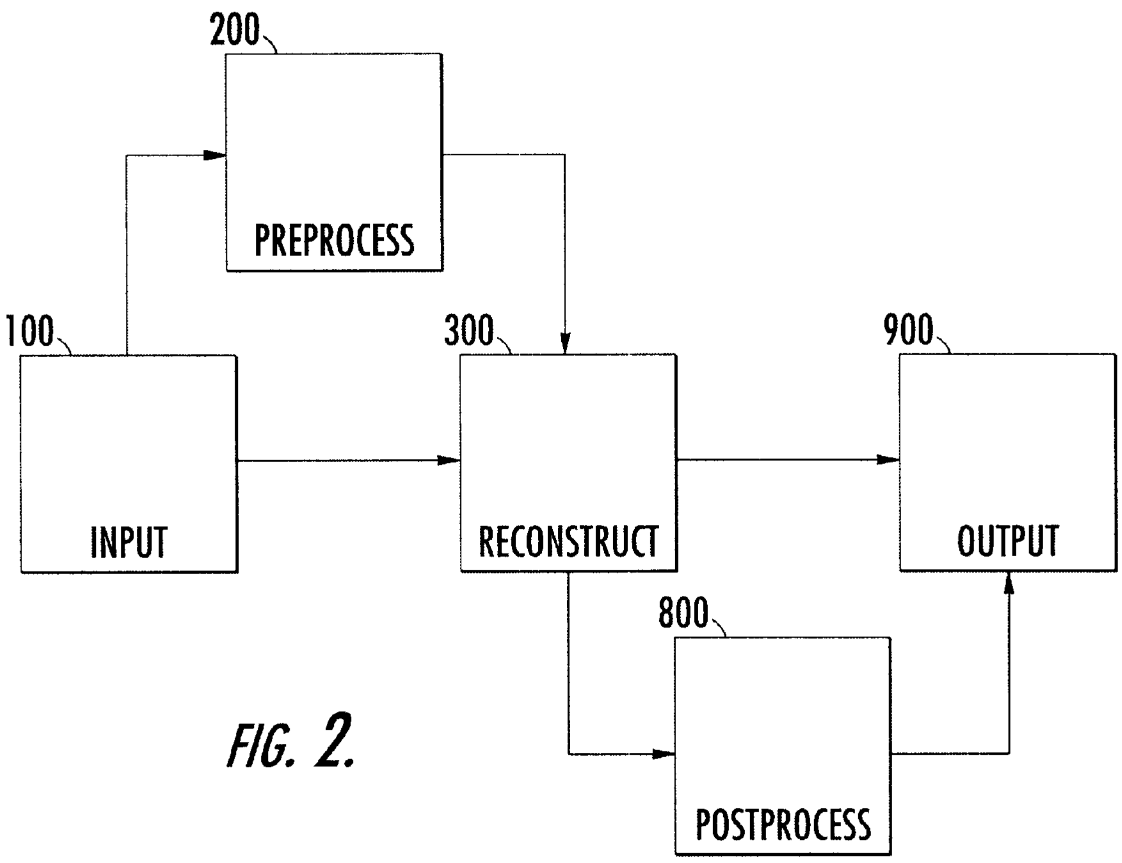


FIG. 2.

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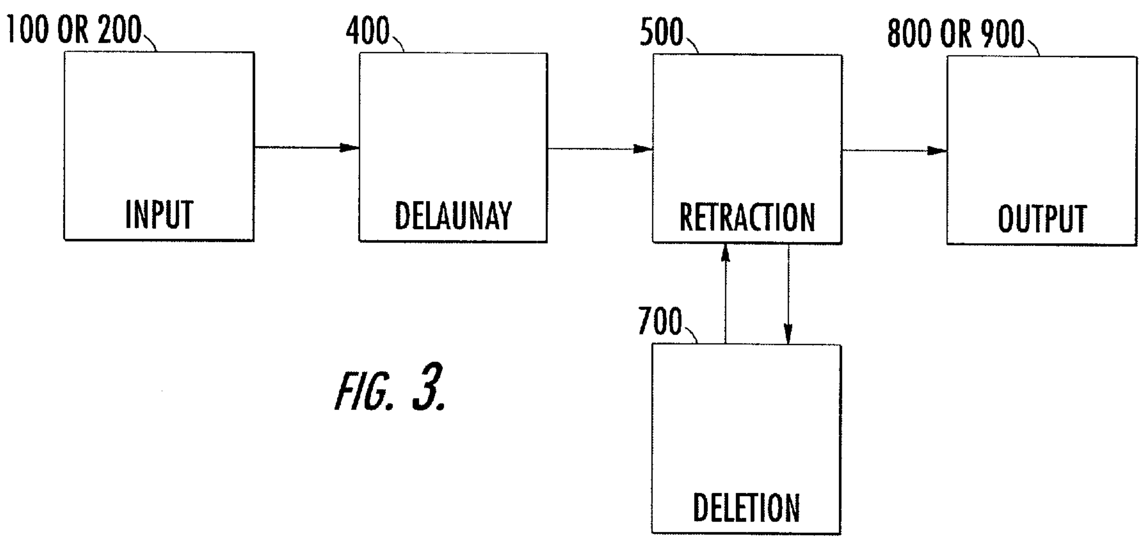


FIG. 3.

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