

(19)
(12)(KR)
(A)(51) 。 Int. Cl. ⁷
A61B 5/02(11)
(43)2001 - 0066943
2001 07 11(21) 10 - 2000 - 0041545
(22) 2000 07 20

(30) 09/357,559 1999 07 22 (US)

(71) ,
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(54)

(cardiac arrhythmias)

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LAT -

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(atrial flutter)

LAT -

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(ventricular tachycardia)

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(sinus rhythm)

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52 :

73 :ECG

1998 7 24

09/122,137

가
82 , 5,391,199 5,718,241 PCT WO94/06349 , WO96/05768 , 5,471,9
5,391,199 WO97/24981

가

가 (3D)
5,391,199 가

가

3D

가 (mesh)

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CT MRI

가

가 (Circulation
)" 74 3 603 615 (1986 9) (Kadish, et al.) "

Vector Mapping of Myocardial Activation)" .

" " 86 2

375 382 (1992 8) (Gerstenfeld et al.) "

(Evidence for Transient Linking of Atrial Excitation During Atrial Fibrillation in Humans)" , " (Cardiol. 1991; 18:1034 - 42)" . . (J. Am. Coll) "

(Detection of Changes in Atrial Endocardial Activation with Use of an Orthogonal Catheter)" , 5,487,391 .

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5,391,199 PCT WO96/05768

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8) (20) 가 (22) (28) (26) (24) (28) (2) PCT WO96/05768 6가 5,391,199 , 5,443,489 PCT WO 94/04938 (28) / 가 , (26) 가

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(18) ECG (73) (52) , ECG (36) (40)

2 (70) , (26) (70) (70) (72) (20) (75, 77) (20)

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가 가 가 가 /
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5a 5e 2 3D
2 (S_i)
5a 1 (90)
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(90)
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가 (90)
, LV -
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가 (90)가 (38)
1992 2 IEEE 14(2): 239
258 (Paul J. Besl and Neil D. McKay) "3-D (A method for registration of 3-D shapes)"
1990 (O. Faugeras, ed.) Computer Vision - ECCV90(1 526 536, 1990 4 23 - 27)
(Heim J. Wolfson) " (Model-based object recognition by geometric hashing)" 1990 (International Journal of Computer Vision) 5 195
212 (P. Huttenlocher and S. Ullman)

(Recognizing solid objects by alignment with an image)"

4

가

$$\begin{array}{c}
 \text{5b} \quad (90) \quad (G_j) \xrightarrow{\vec{v}_j} G_j \quad (92) \quad (S_i) \xrightarrow{(\vec{v}_{j\mu})} (k) \quad \text{가} \quad (92) \quad (G') \quad (92) \\
 (G_j) \quad (90) \quad (G_j) \quad (92) \quad (G'_j) \quad (90) \quad (G_j) \quad (90) \quad 5a \\
 G_j \quad (S_i) \quad (\vec{v}_{j\mu}) \quad (k) \quad \text{가} \quad (\vec{v}_{j\mu}) \\
 , k \quad 4 \quad 10 \quad , \text{가} \quad 6 \quad 8 \quad . \\
 , \quad (\vec{v}_j) \quad (1) \quad .
 \end{array}$$

1

$$\frac{\vec{V_j}}{V_j} = C_f \sum_i \frac{\vec{V_{ij}}}{r_j^{k+\varepsilon}} \div \frac{1}{r_j^{k+\varepsilon}} \cdot r_j = \left| \frac{\vec{V_{ij}}}{V_{ij}} \right|$$

$$(1) \quad \varepsilon_0 = 10^{-6}, \quad \varepsilon_0 = 0.5, \quad \varepsilon_0 = 0.9, \quad \text{가}$$

2

$$\delta_i = \frac{1}{\sum_j \frac{1}{(S_j - S_i^2 + 1)}}$$

S, (δ) 1 (δ) ,가

5c 가 1 , (S_i) (92) G'
(G_j) . ,
(S_i) 가 가 (92) , S₁ 가 가 G₁' .
(36) ,
5c .

(f)가 .
 (f) . (f) ,
 (f) , 가
 (f) (3)
 (4) $w_i(G_j)$ (G_j) (G_i)
 (1) (G_j) (S_i)
 가 , k
 , 가 k 2 6 , 가 4 . , k
 , S_i, G_i f(G_j) (1)

3

$$\vec{f(G_j)} = \frac{\sum_i w_i(G_j) \cdot (S_i - G_i)}{\sum_i w_i(G_j)}$$

4

$$w_i(G_j) = \frac{1}{\|G_j - S_i\|^k + C} \quad C > 0$$

(C) 가 C
 (G_i) (S_i) , C 0.3 0.7 ,
 0.5 가 , C 가 가 , C
 가 , 1 가 , C C

(2), (3) (4) R³ ,

, 5c
 2/3 ,

5d (S_i) (G'_k) (G'_l)
 ($\vec{v'_k}$) (G'_k) (G'_l)
 , G'₁₅ G'₁₆ X₂ ,
 가 , - ($\tilde{x}_2$)
 - ($\tilde{L}_2$), (L₂)
 , 1 가 - ($\tilde{L}_2$ $\tilde{x}_2$) , 가
 (X₂)

5d (G'₁₅) (G'₁₄, G'₁₆) ($\vec{v_{14}}$, $\vec{v_{16}}$)
 , $\vec{v_{15}}$ (5) , d
 , X₁, $\tilde{x}_1$, l₁
 , X₂, $\tilde{x}_2$, l₂
 1 가 , d₁ d₂ X₁ X₂ .
 G₁₅ G₁₄
 , d₂ G₁₅ G₁₆
 , 5d

5

$$\begin{array}{c} \rightarrow \\ V'_{15} \end{array} = \frac{d_2}{d_1+d_2} \begin{array}{c} \rightarrow \\ V'_{14} \end{array} + \frac{d_1}{d_1+d_2} \begin{array}{c} \rightarrow \\ V'_{16} \end{array}$$

(8)

가, 가 (4 N₀) . ,

가 . , 가
3×3 가 .

5 10
가 1

, 가 가

$$\frac{1}{5e} \leq \frac{1}{5e} \leq \frac{1}{5e} \quad (100)$$

, 가

(36)

(36) 가 가

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 (t_i) (t_i)

가

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2

, 가 (N_T) , $(N_T <$
 NO) , 가 2
 , $(t1)$, 가
 , $(t1)$,
 , 가
 , (20) (24)
 $(S_1,$
 $S_2, S_6,)$ $(G'_1, G'_4, G'_7,)$

가 , 가 가

가 , 0 - (zero - order - hold filing in method)

가 , 가

, 3D

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6 (130)
 (134) (130) (132) , (132)
 , 가 (132)
 (134) (140)
 가 (132) , $(\alpha - \text{blend}$
 ing) (130) (136) (130)
 , 가 /

7 , 가 ,

7 (150) (150)
 4 , 4
 가 (150) 가 (O) , (150)
 4 (152) (152) (150)

$$4 \quad (150) \quad m - \quad (150) \quad (V) \quad (O) \quad A_m, B_m, C_m \quad (6)$$

6

$$V = \frac{1}{6} \sum_m (B_m - A_m) \times (C_m - A_m) \cdot (O - A_m)$$

8
3D
(120)
(34)
(20)
(124)
(124) 가
(70)
(76)
(36)
(76)
(122)
(76)
(42)
가
가
가
3D
3D

ECG (20) (24) (LAT: local activation time) . (24) (,) , ECG (73) ECG 가 , LAT가 , 가

$(d(V))$ 0 - LAT (V) 가 .

$(N_i \in \{N_1, \dots, N_m\})$
 $[d(V), \min(d(N_i) + d(V, N_i))]$
 $d(V)$ 가

$0 \leq d(V)$
 $(d(V, N_i))$
 $d(V)$
 (N_i) LAT
 $d(V)$ LAT

3D

LAT
 $(\vec{a}, \vec{b}, \vec{c})$ (200), $(\vec{v})$
 (200) 가 (202)
 $(\vec{a})$ (202) $(\vec{b})$ (202) $(\vec{c})$ (202)
 $t_a \leq t_b \leq t_c$ (202) $(\vec{b})$ (200) ac $(\vec{d})$

7

$$\vec{d} = \frac{t_b - t_a}{t_c - t_a} \vec{c} + \frac{t_c - t_b}{t_c - t_a} \vec{a}$$

$$\vec{v}$$

8

$$\frac{\vec{v}}{\|\vec{v}\|} = \frac{\vec{d} - \vec{b}}{\|\vec{d} - \vec{b}\|} \times \vec{N}$$

$$\vec{v}$$

$$\vec{a} \quad \vec{c}$$

9

$$\|\vec{v}\| = \frac{\vec{c} - \vec{a}}{t_c - t_a} \cdot \frac{\vec{v}}{\|\vec{v}\|}$$

가

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- 가
- (gray scale)
- 가
- 가
- , LAT
- 10
- (10)
- (1)
- (가) 1
- 11
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- (sinus rhythm)
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(LAT: local activ

ation time)

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(LAT)

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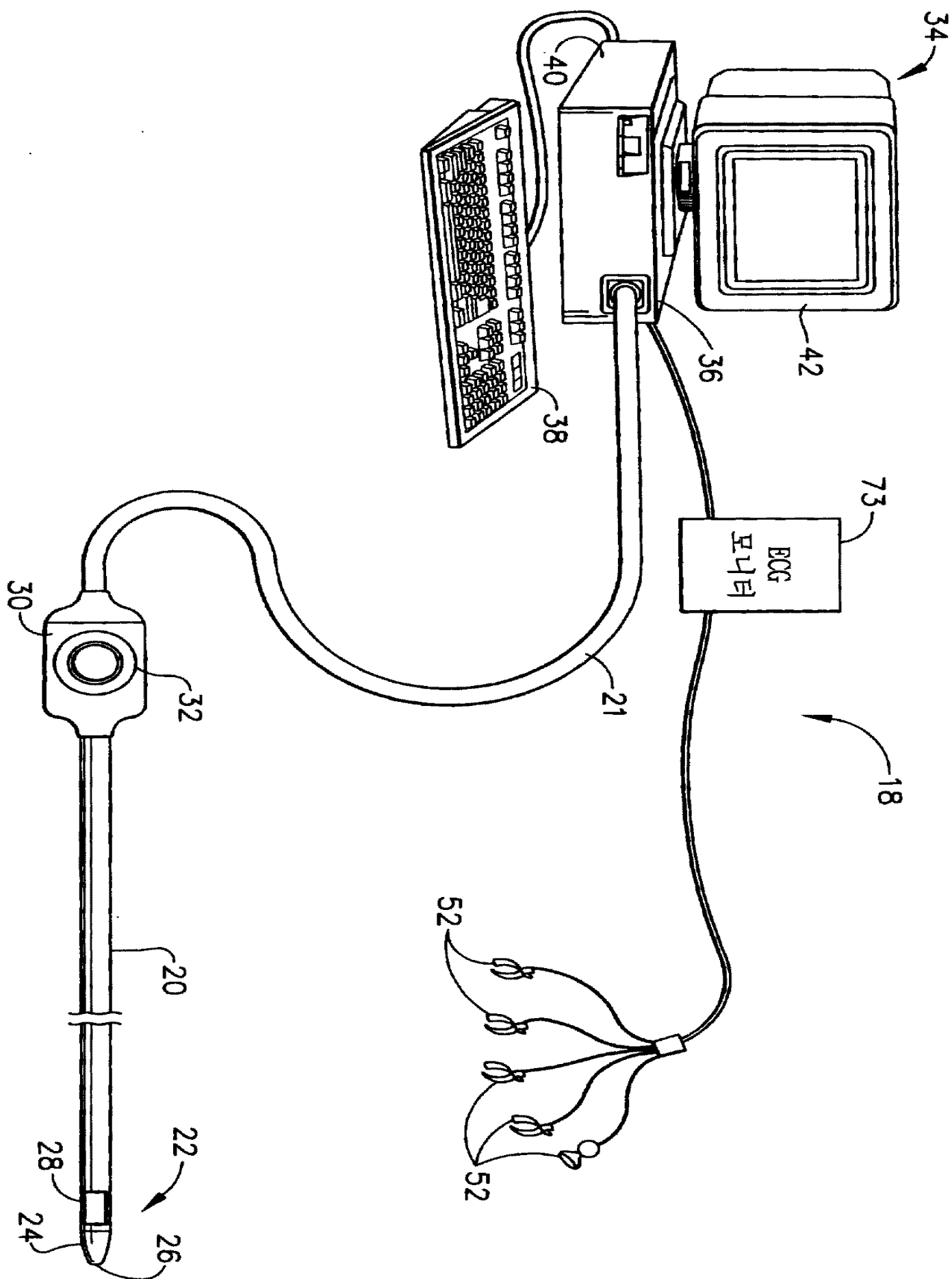
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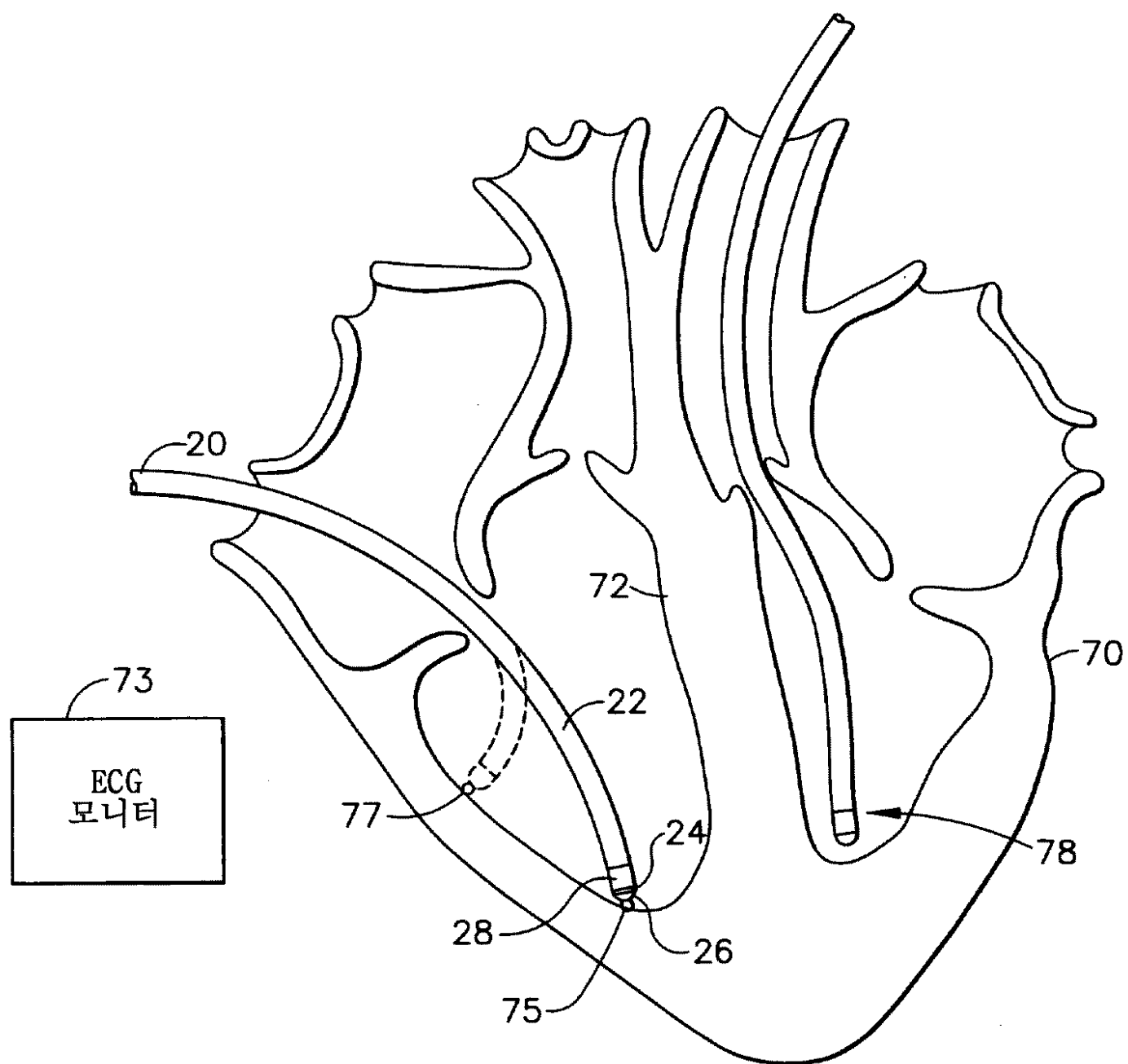
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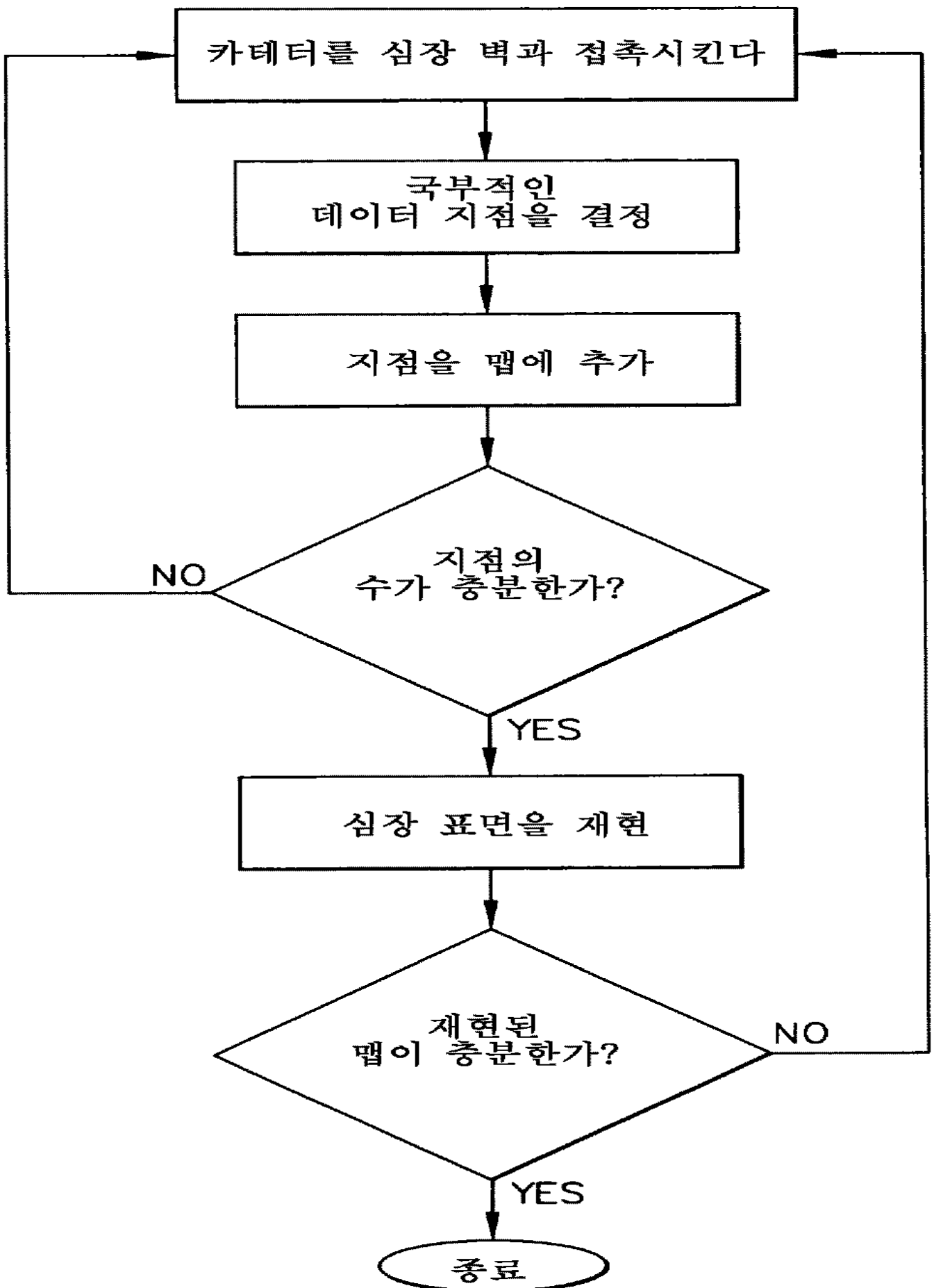
1



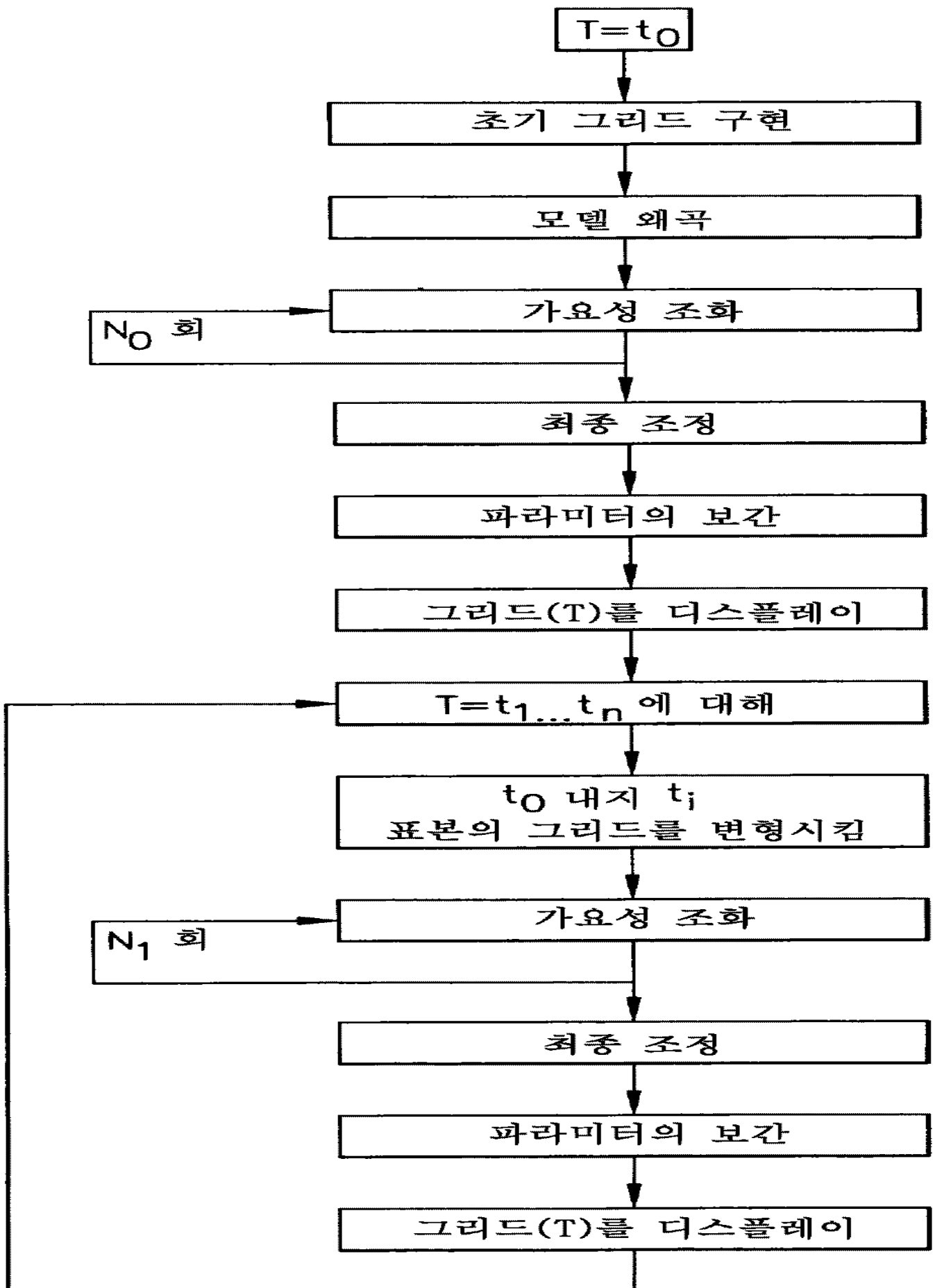
2



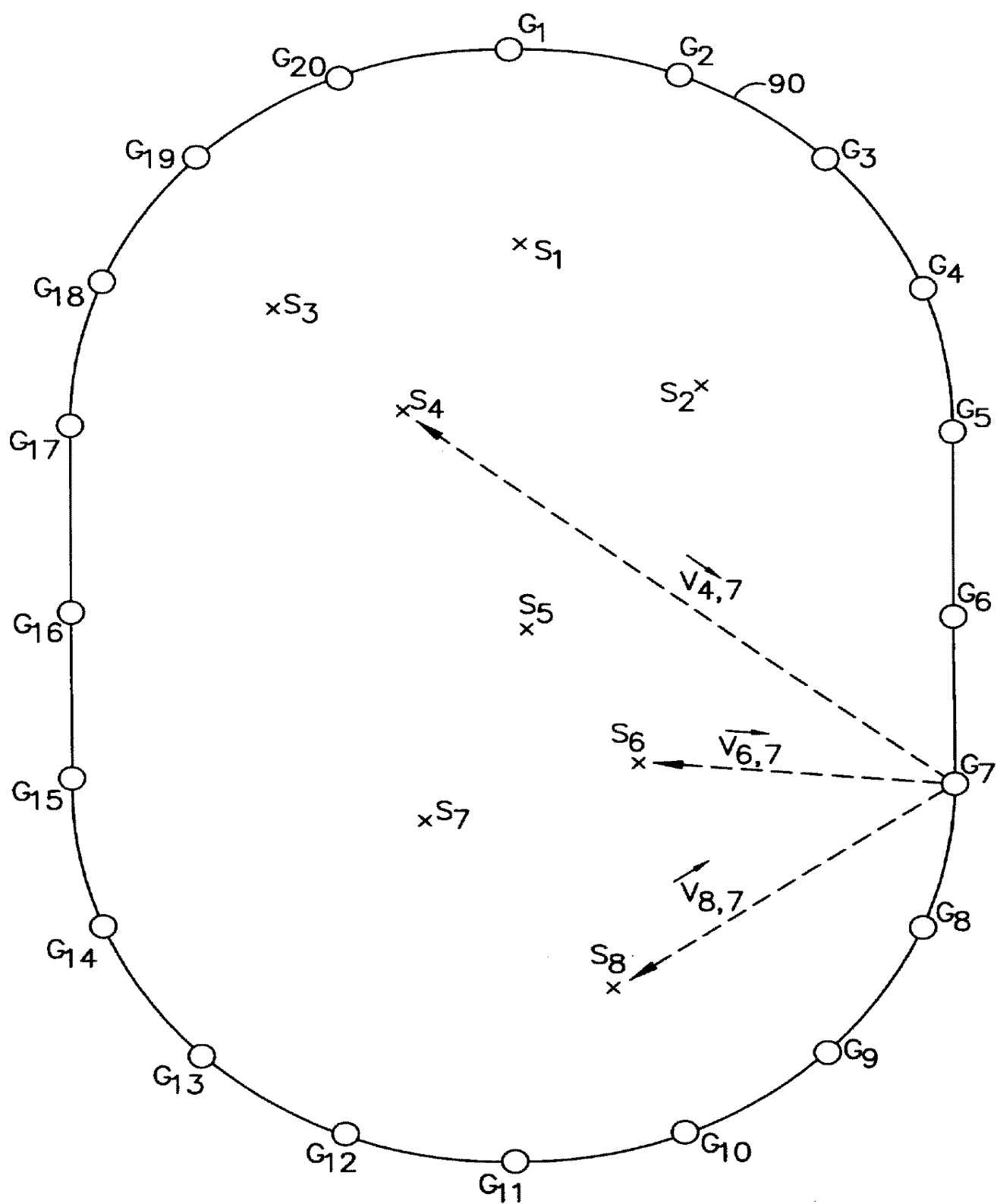
3



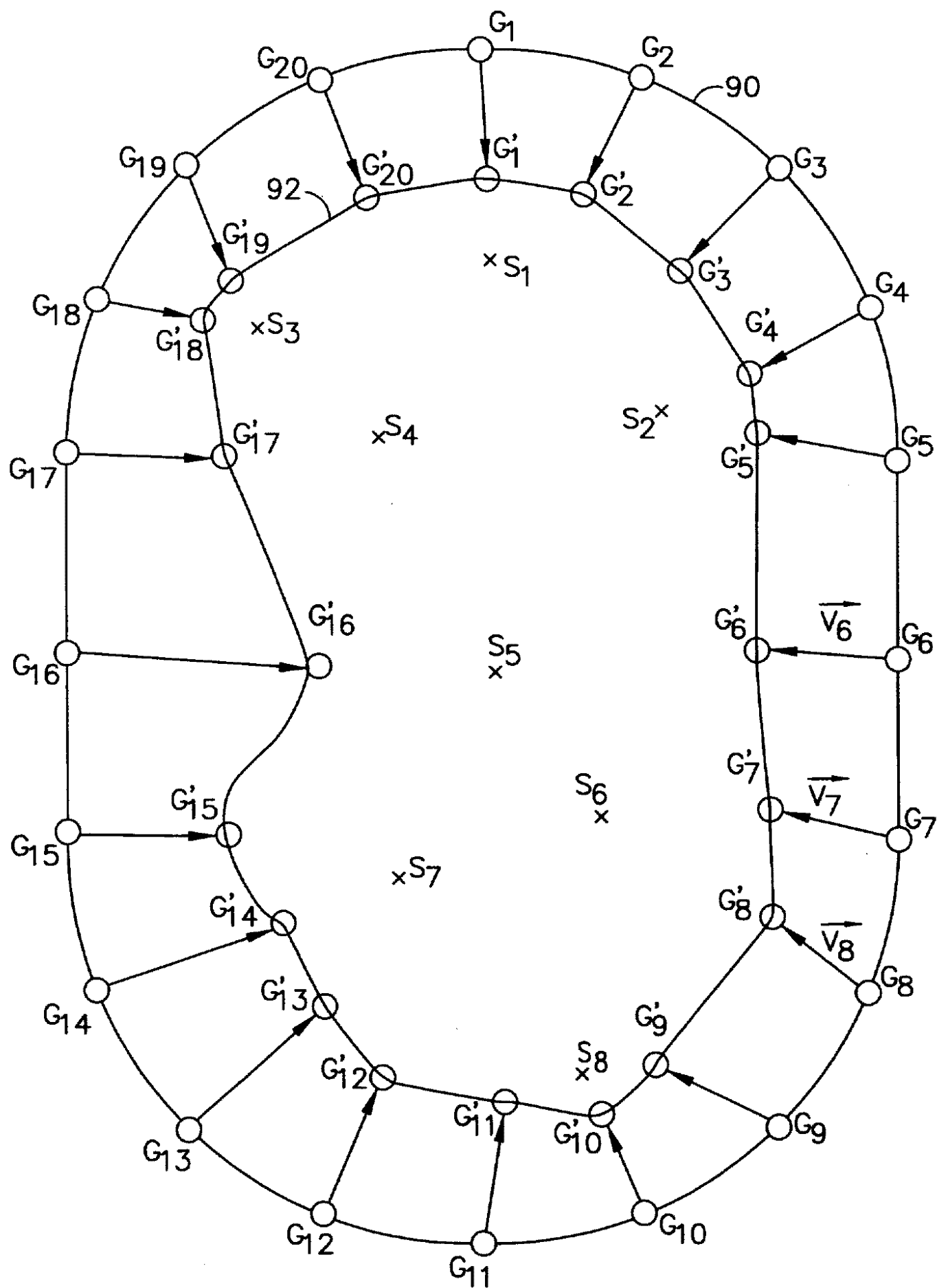
4



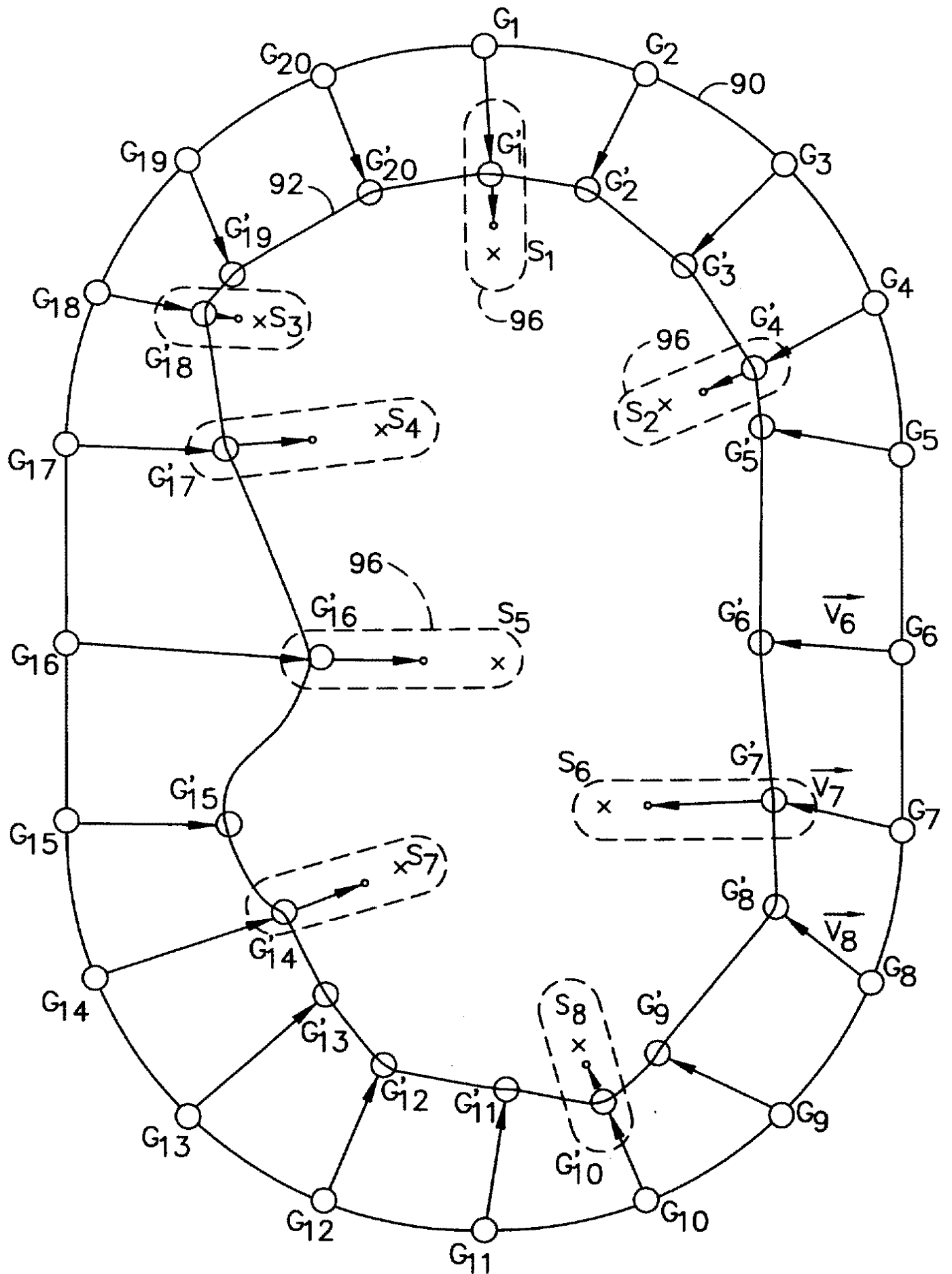
5a



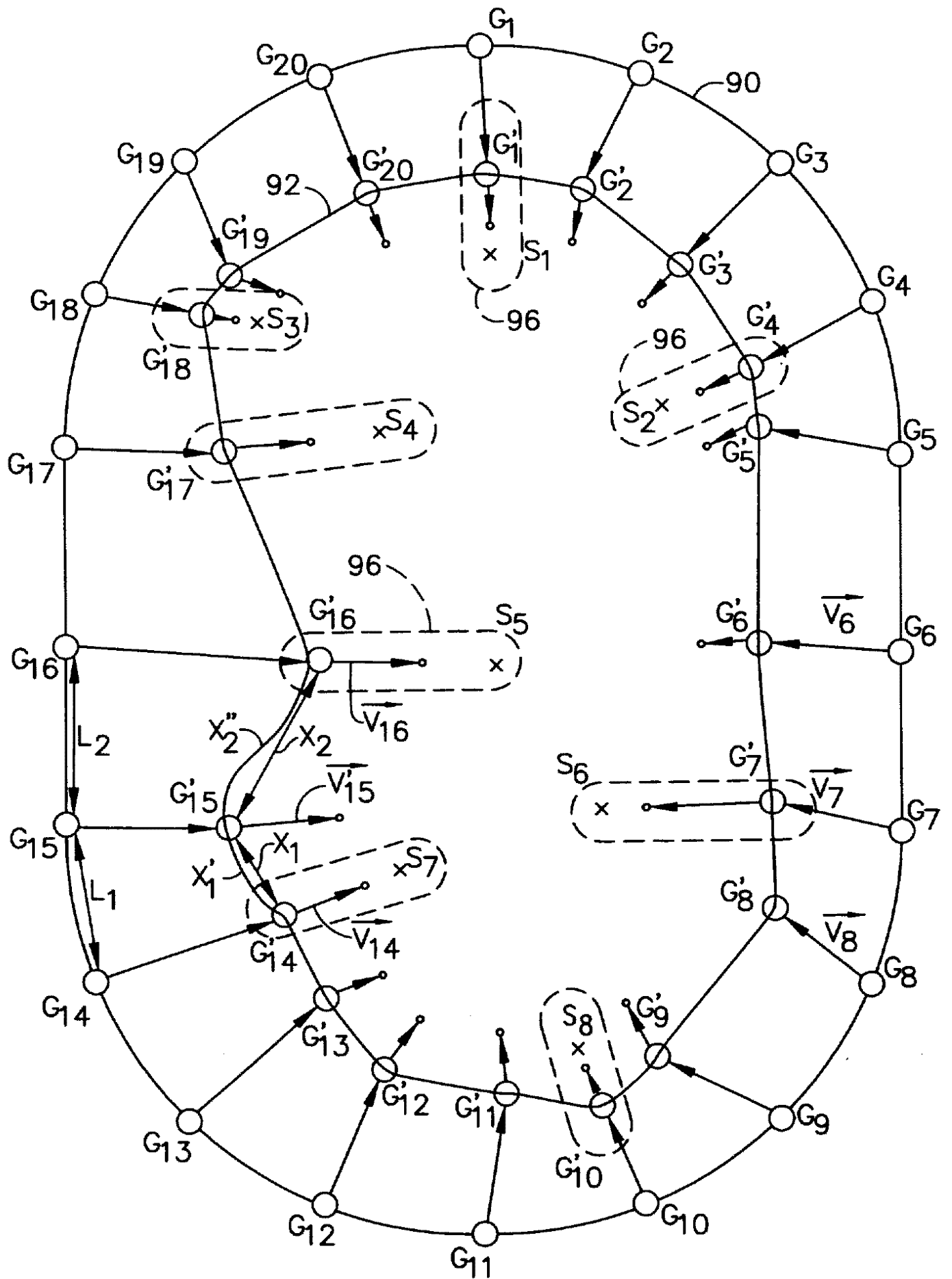
5b



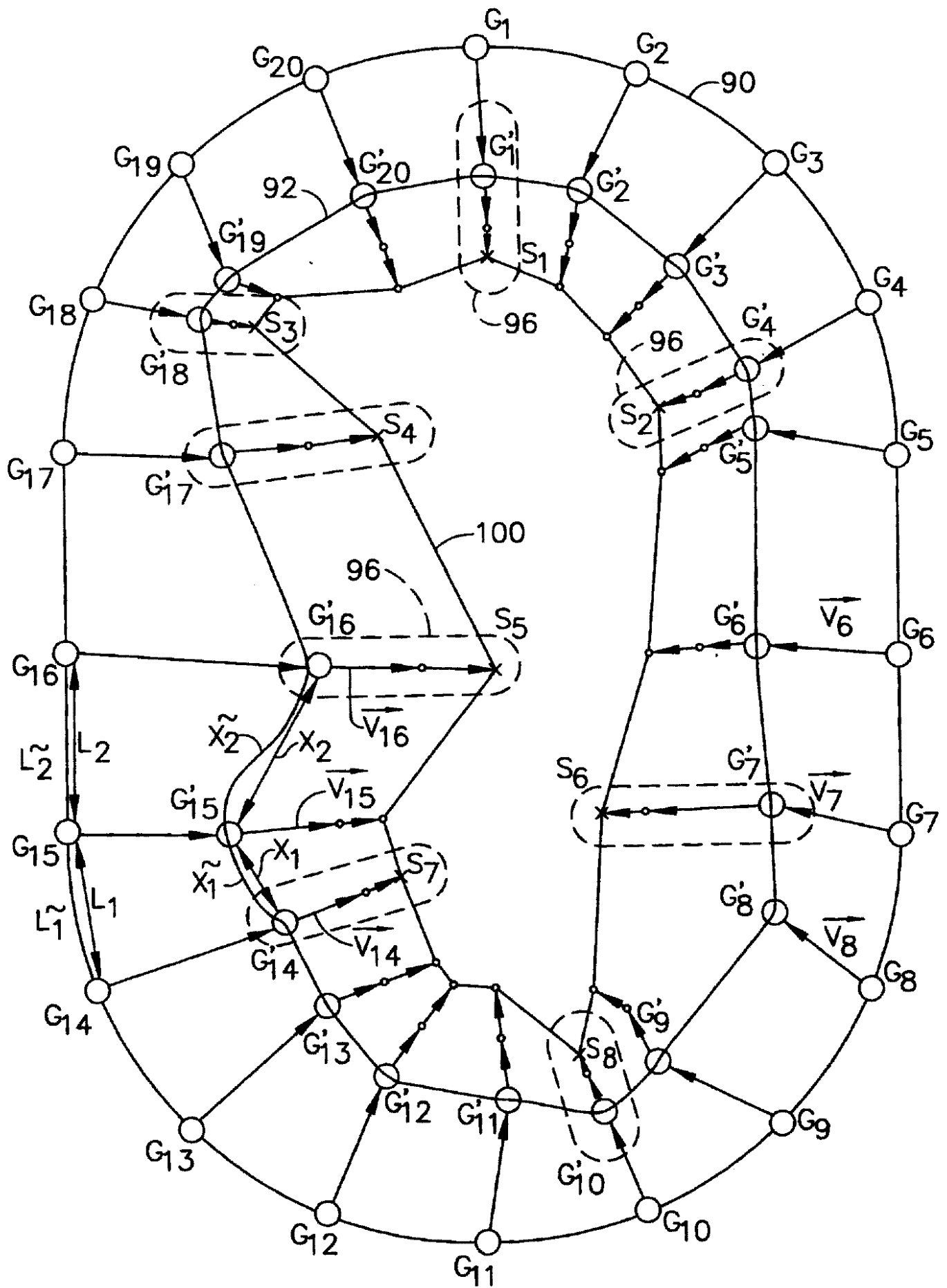
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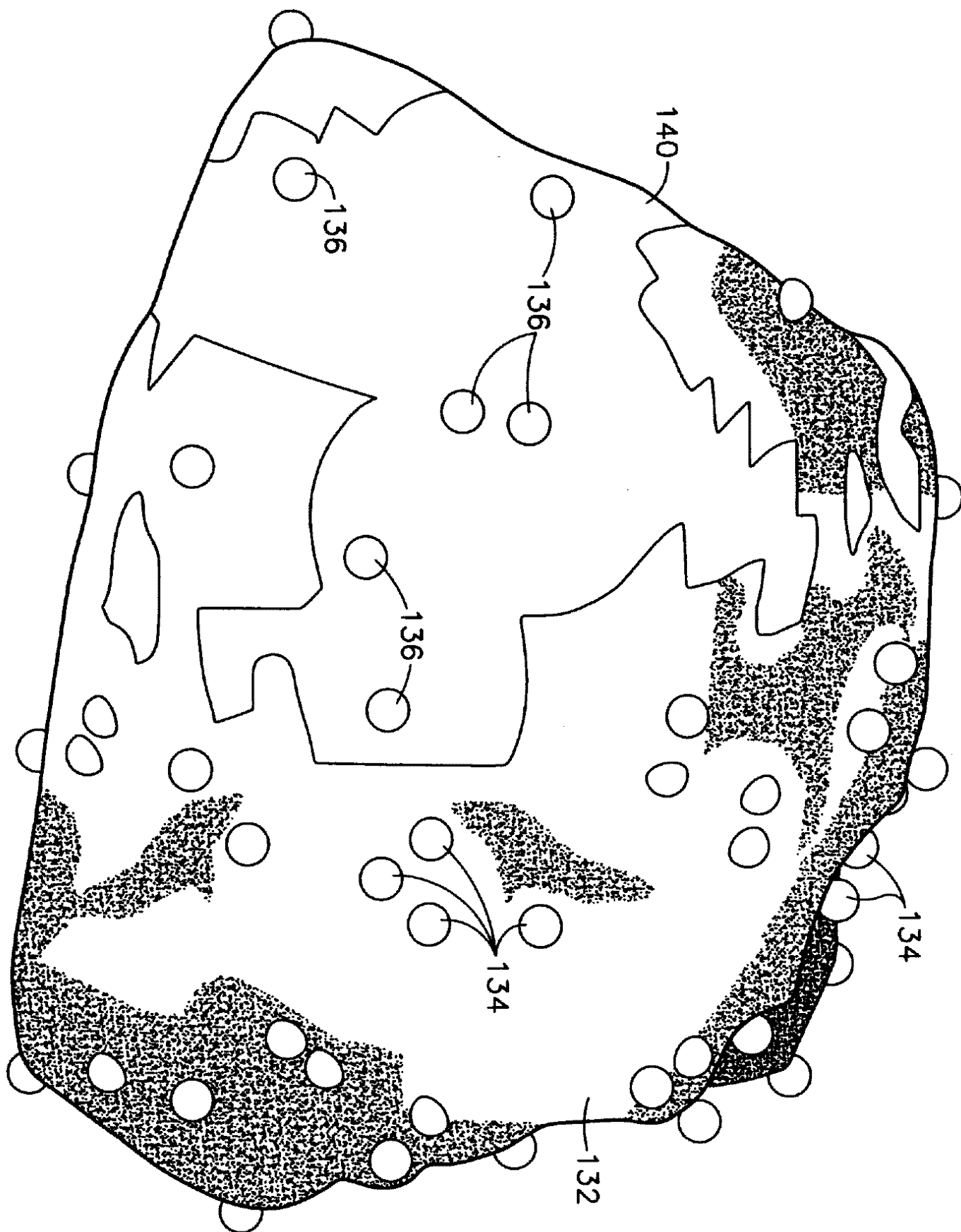


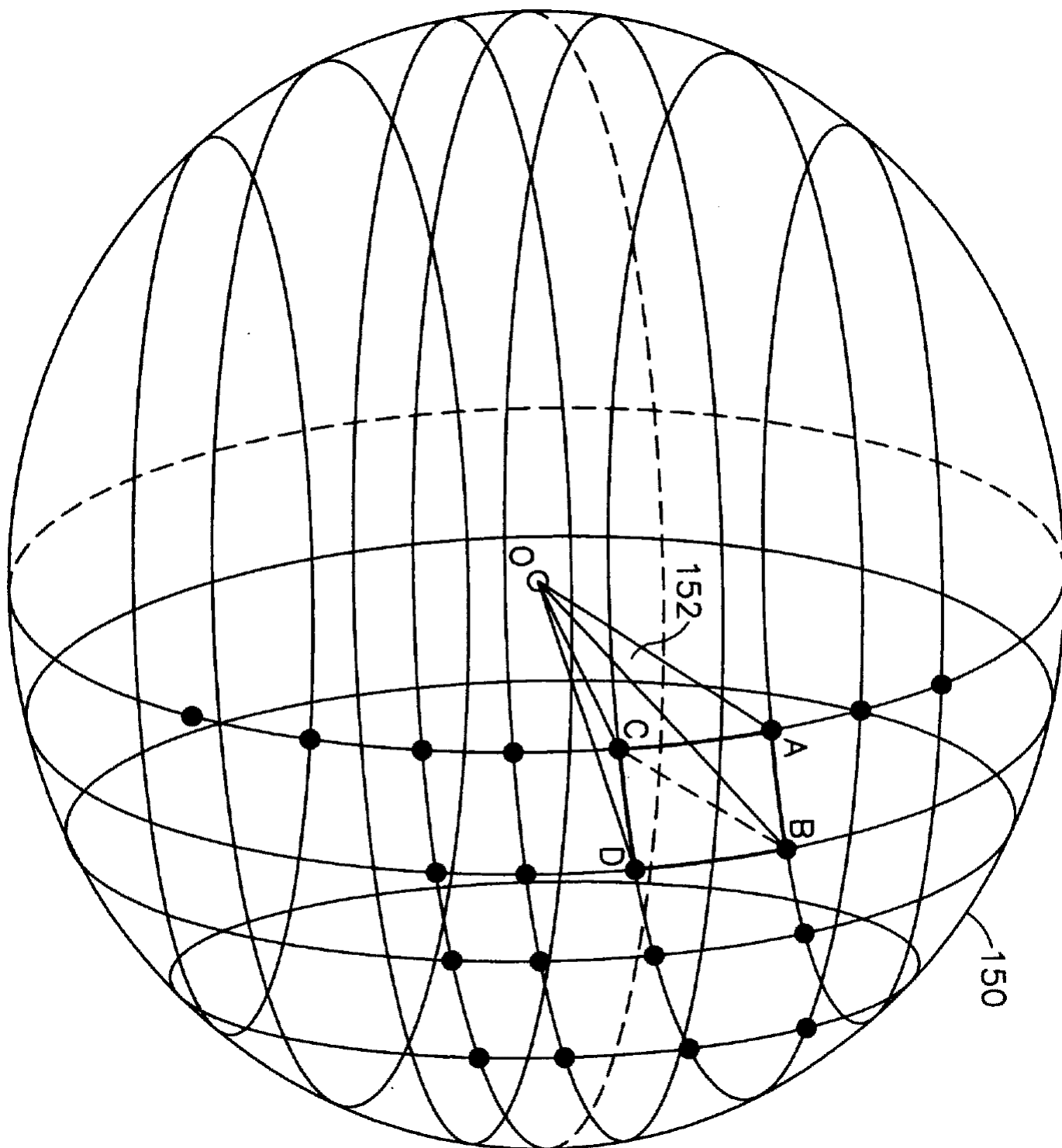
5d

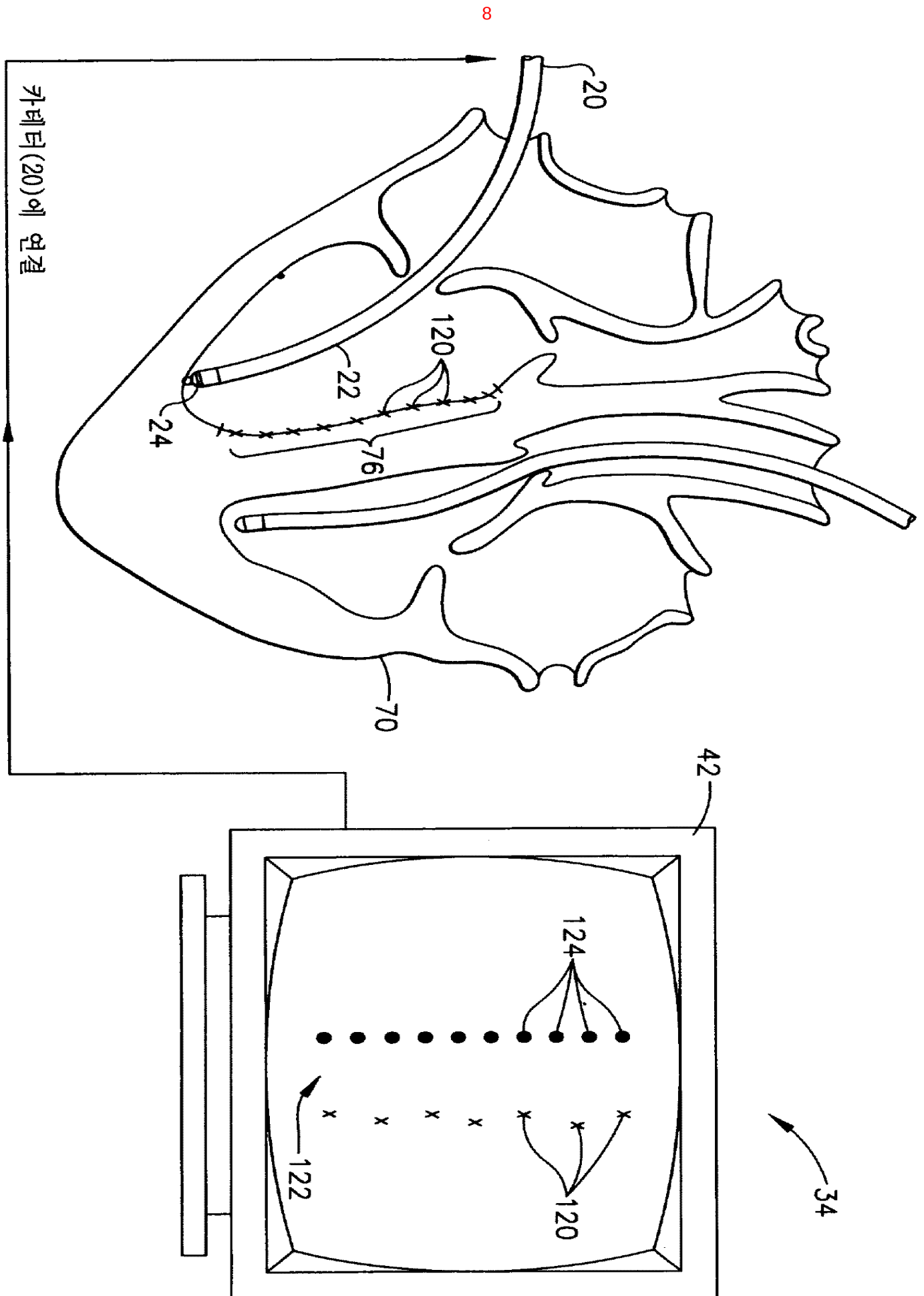


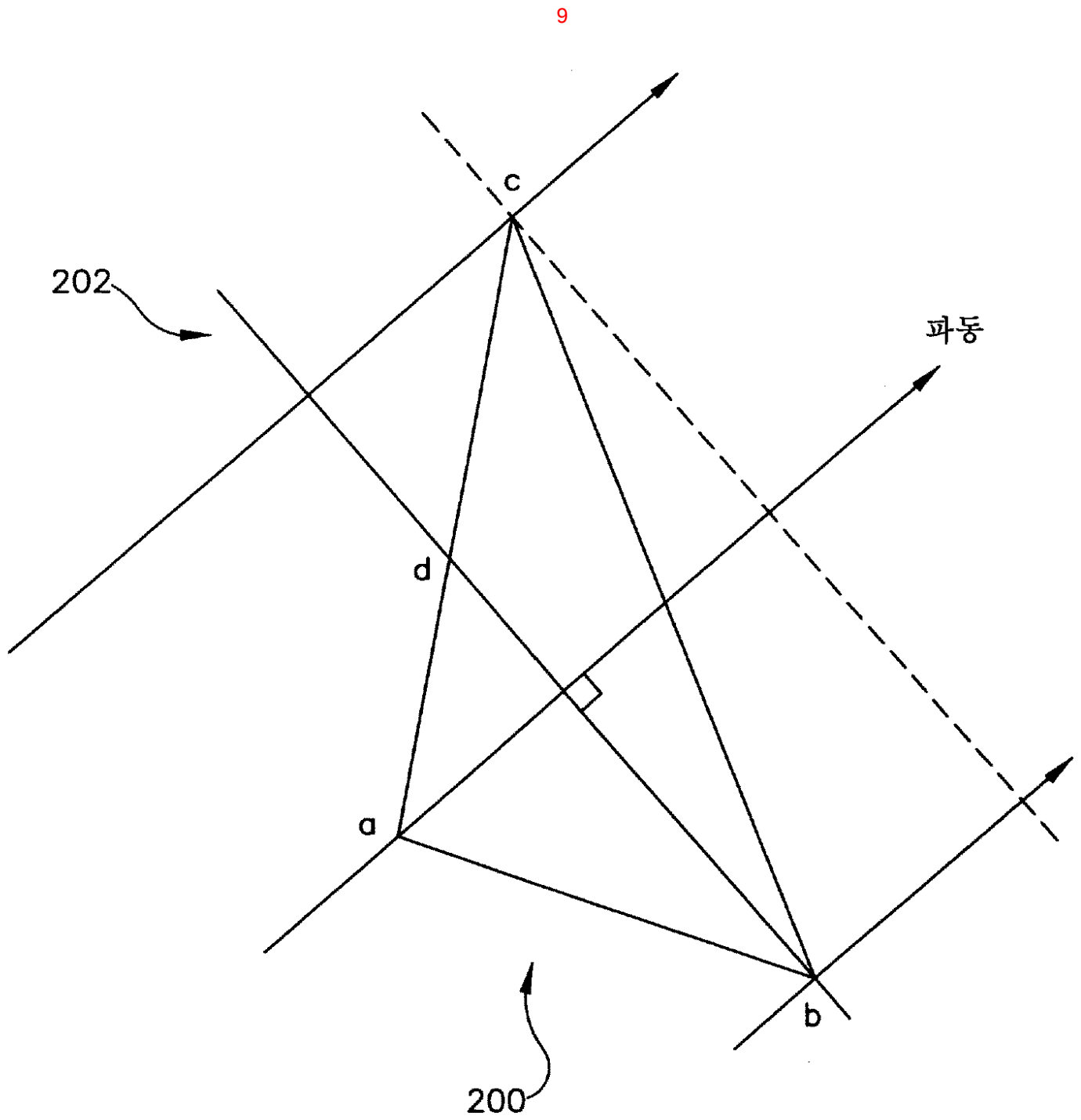
5e



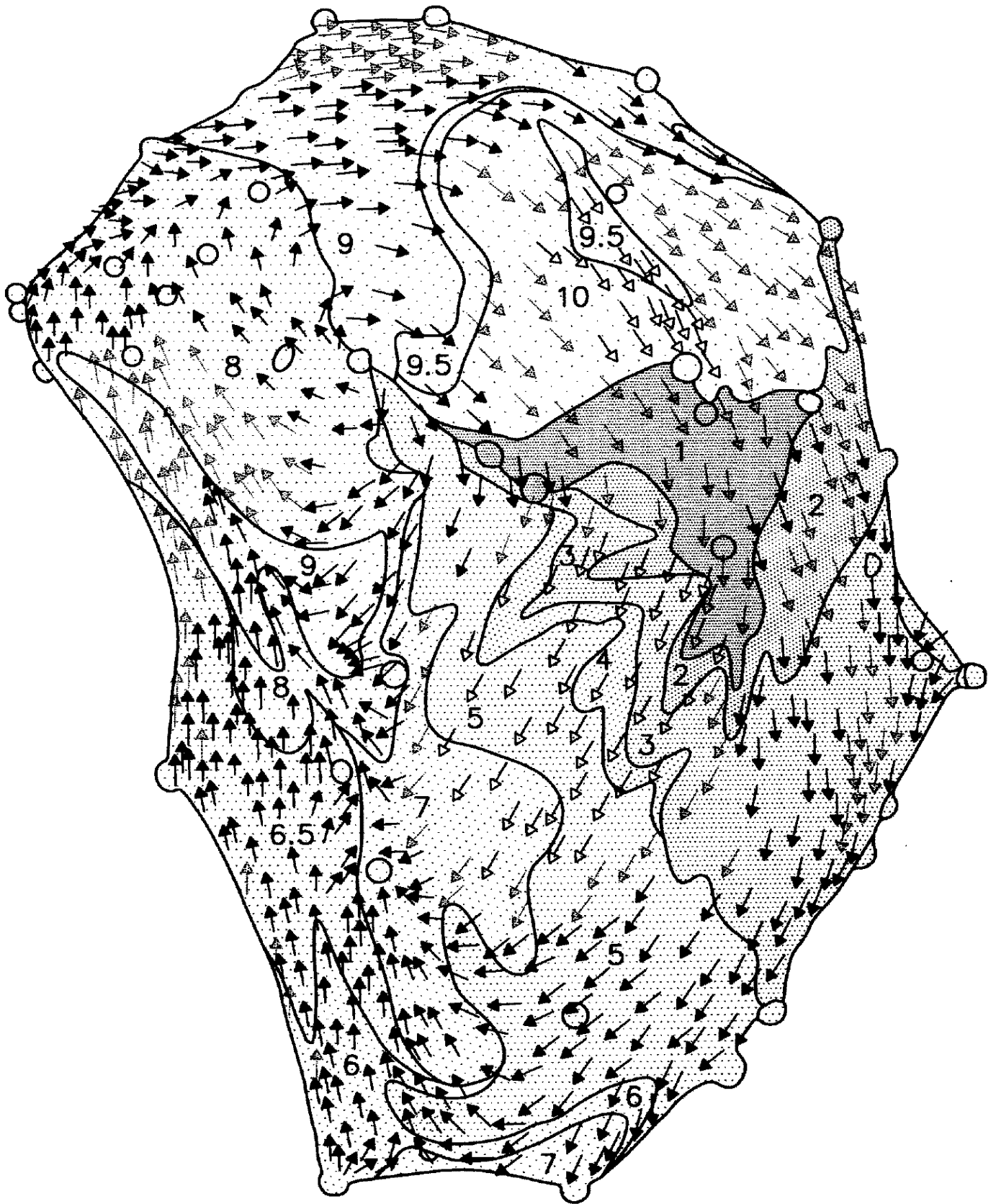




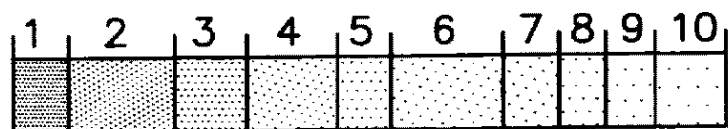




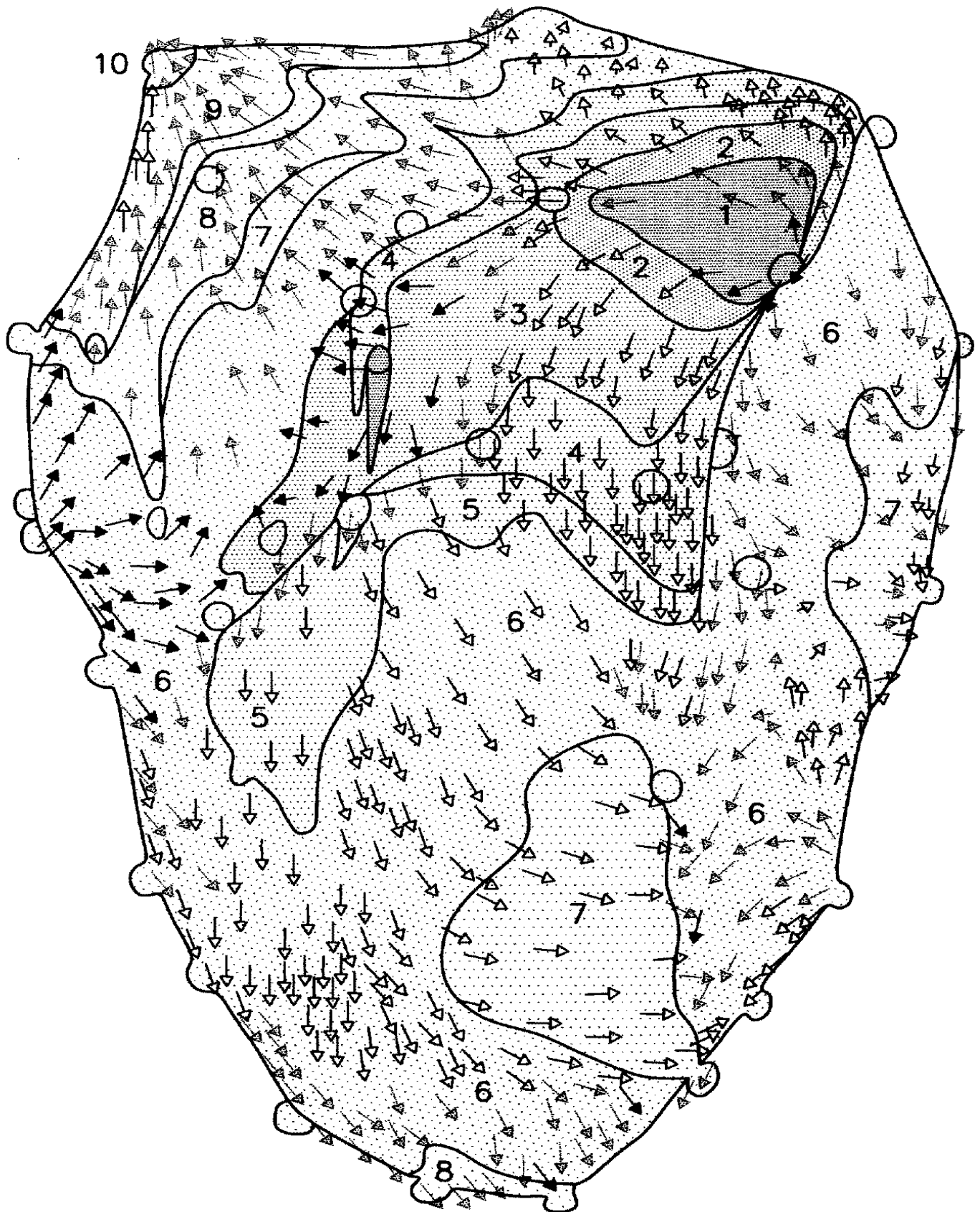
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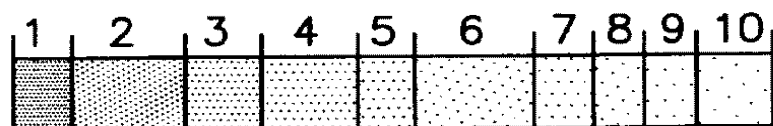
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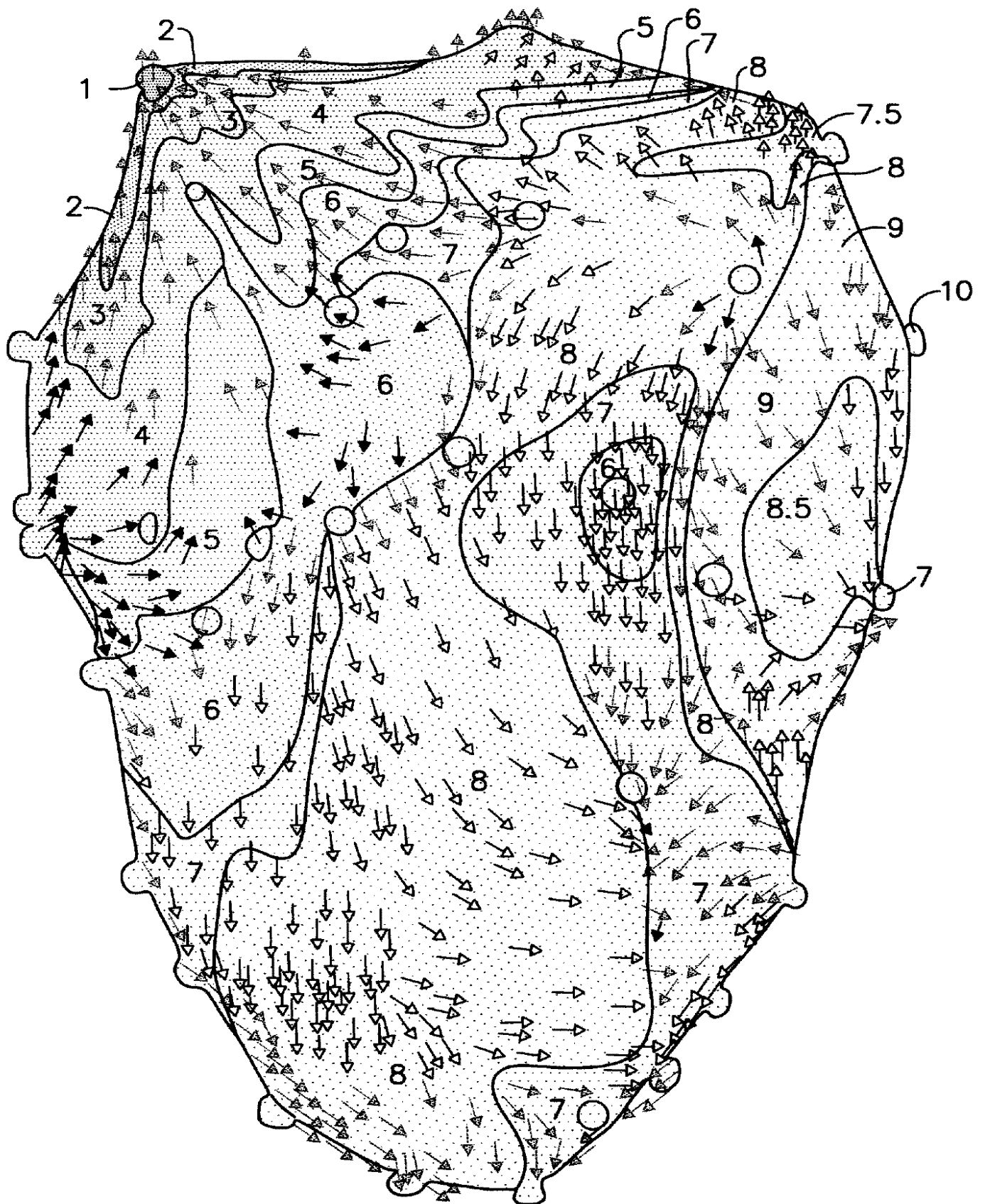


11

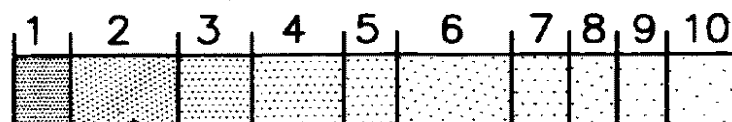


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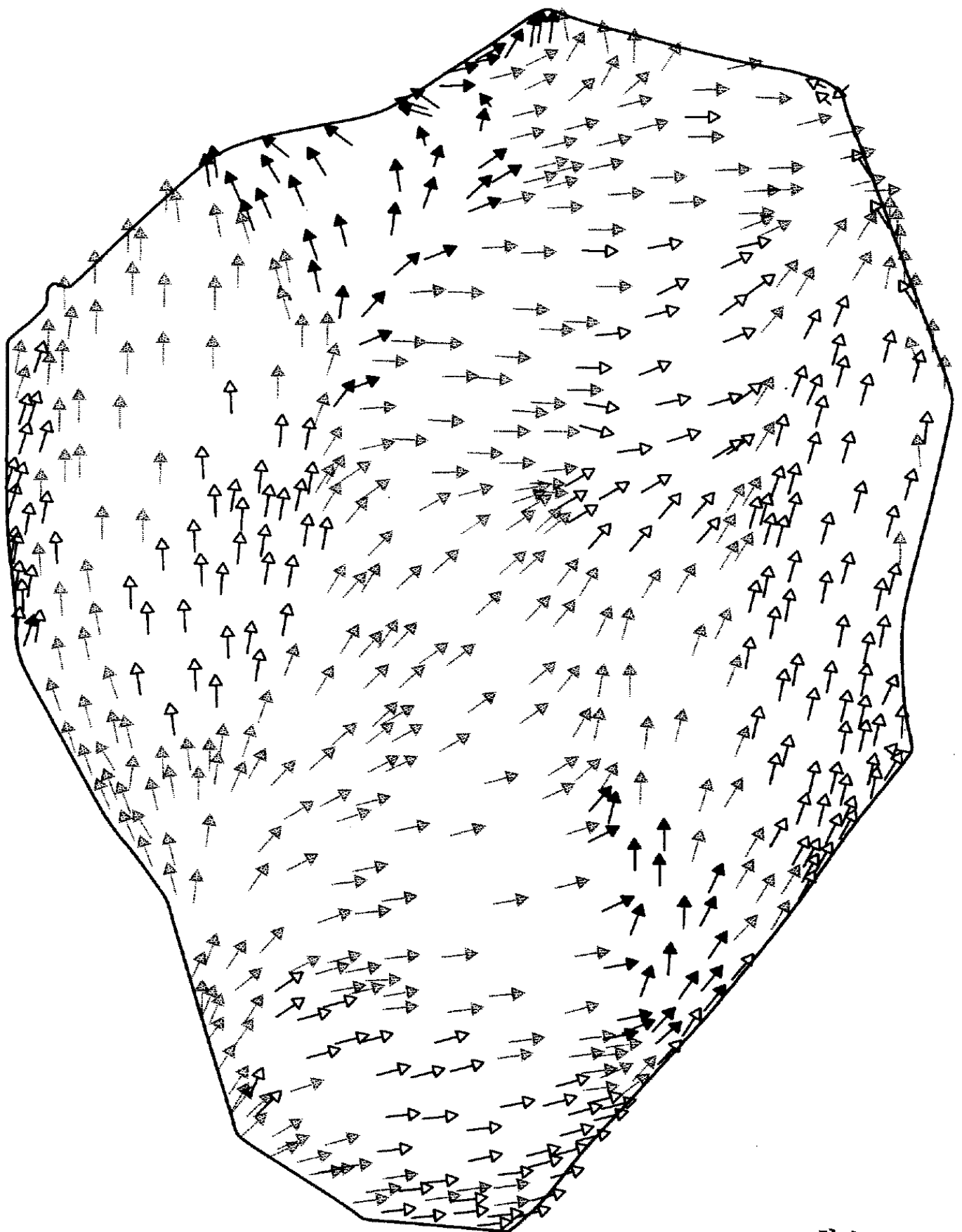




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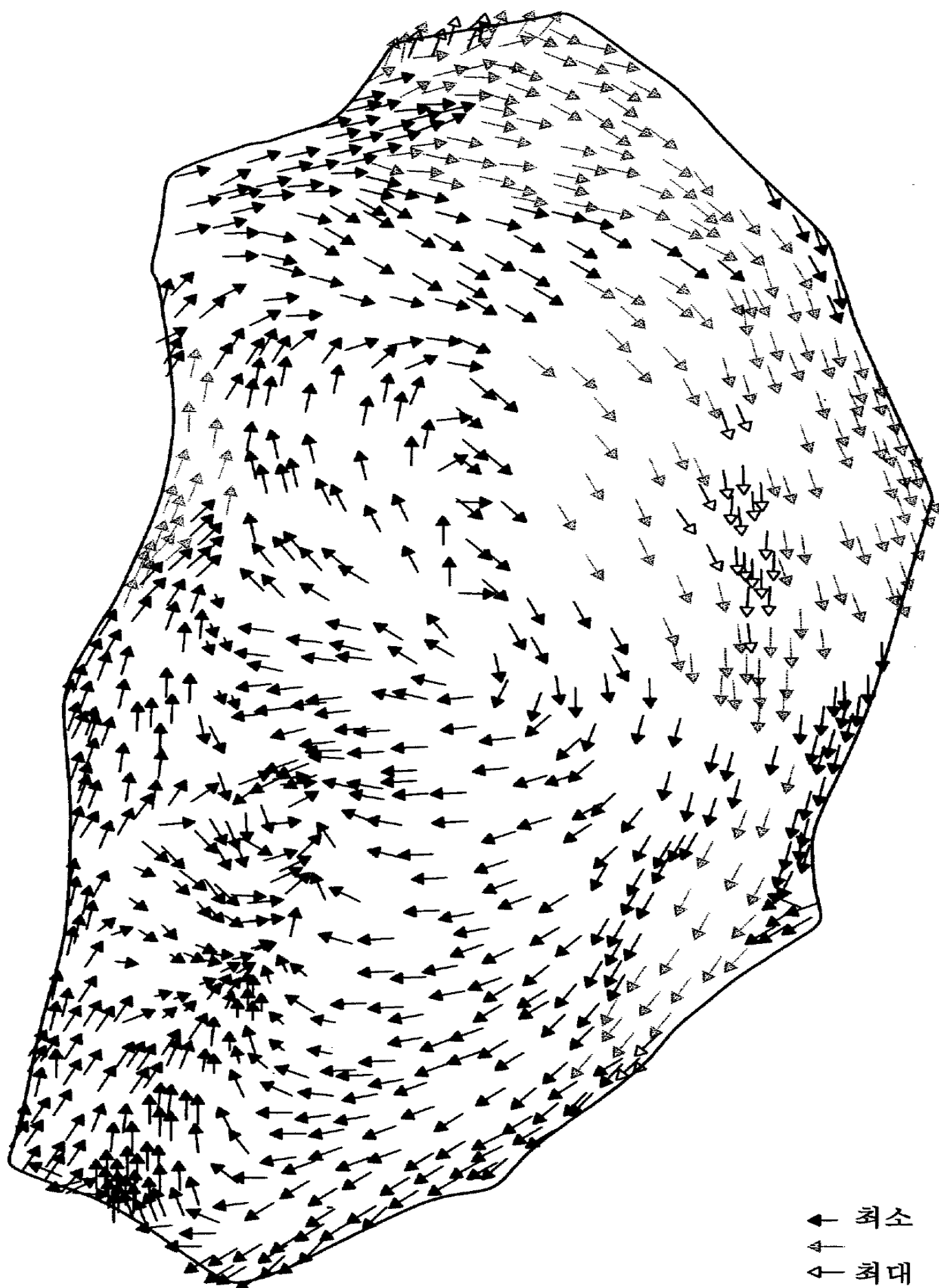


13



← 최소
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14



专利名称(译)	矢量映射和显示三维再生内脏		
公开(公告)号	KR1020010066943A	公开(公告)日	2001-07-11
申请号	KR1020000041545	申请日	2000-07-20
[标]申请(专利权)人(译)	生物感觉有限公司		
申请(专利权)人(译)	生物感觉，鼻子的激光炮		
当前申请(专利权)人(译)	生物感觉，鼻子的激光炮		
[标]发明人	REISFELD DANIEL		
发明人	REISFELD,DANIEL		
IPC分类号	A61B5/02 A61B5/042 G06T17/20 A61B5/0402 A61B5/00 A61B A61B5/01 A61B5/0408 A61B5/044 A61B5/04 G06T A61B5/107 A61B5/06 A61B5/05 G06T1/00		
CPC分类号	A61B5/04011 A61B5/04085 G06T17/20 A61B5/0422 A61B5/743		
代理人(译)	李昌勋 李，何炳 李贝尔		
优先权	09/357559 1999-07-22 US		
其他公开文献	KR100686477B1		
外部链接	Espacenet		

摘要(译)

在本发明的心脏等生理结构中诊断异常状态的方法包括计算测量步骤的步骤，以及关于生物结构体表面上至少3个样品点的生理反应的反应的矢量函数，和从显示过程评估异常状态的步骤。从显示过程评估异常状态的步骤指示并显示矢量功能。本发明涉及生理反应为电压的传导速度。心脏，样本点，生理反应，矢量函数，部分激活时间。

