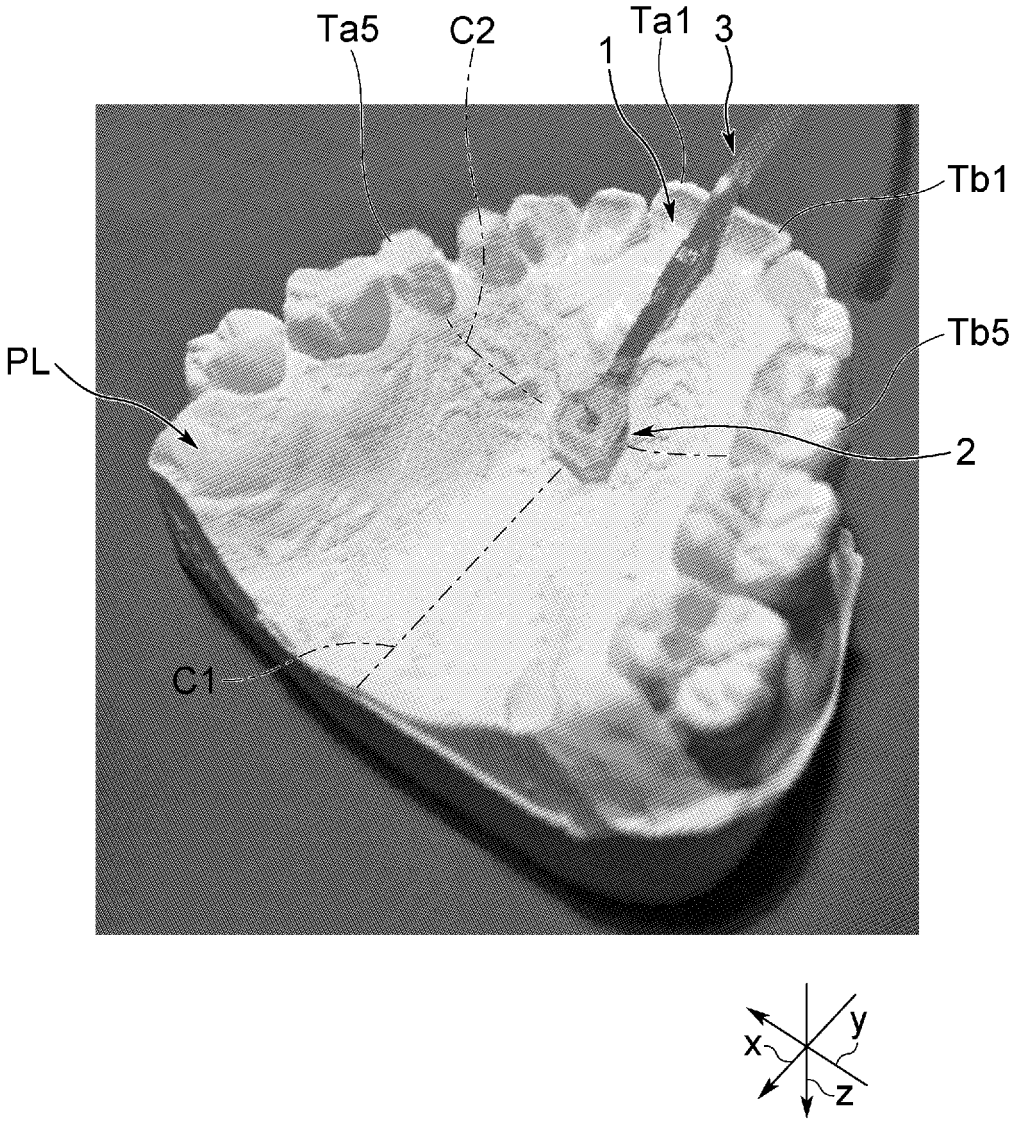
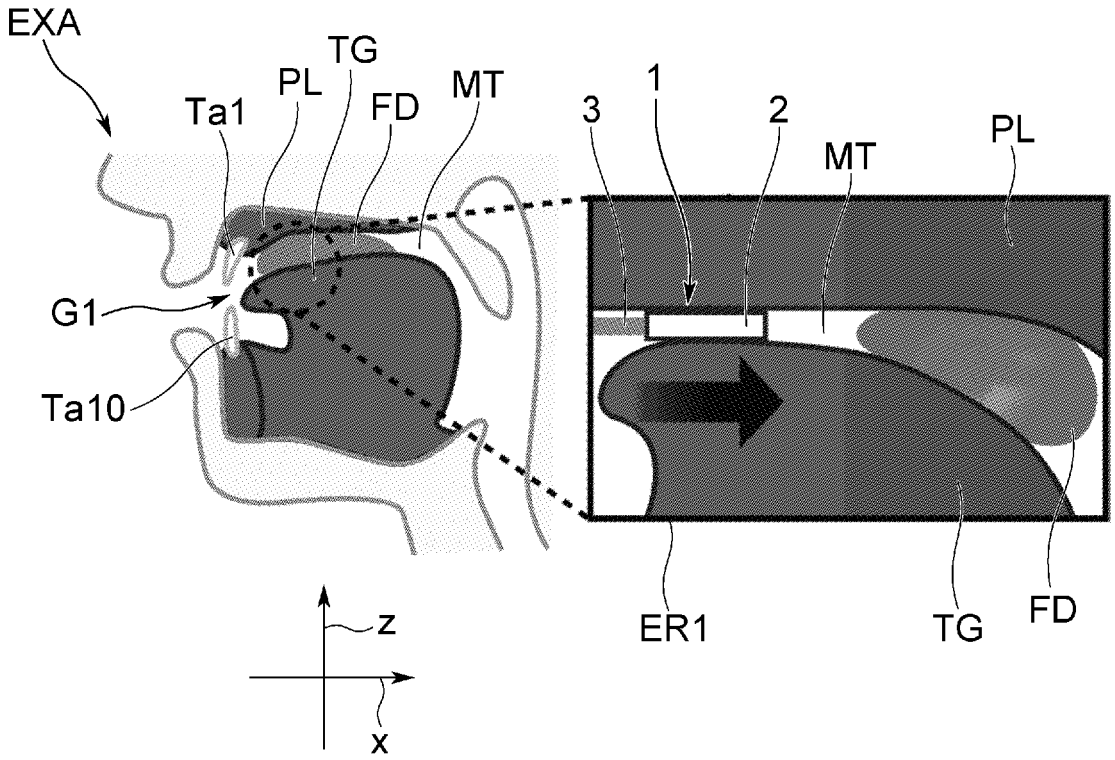
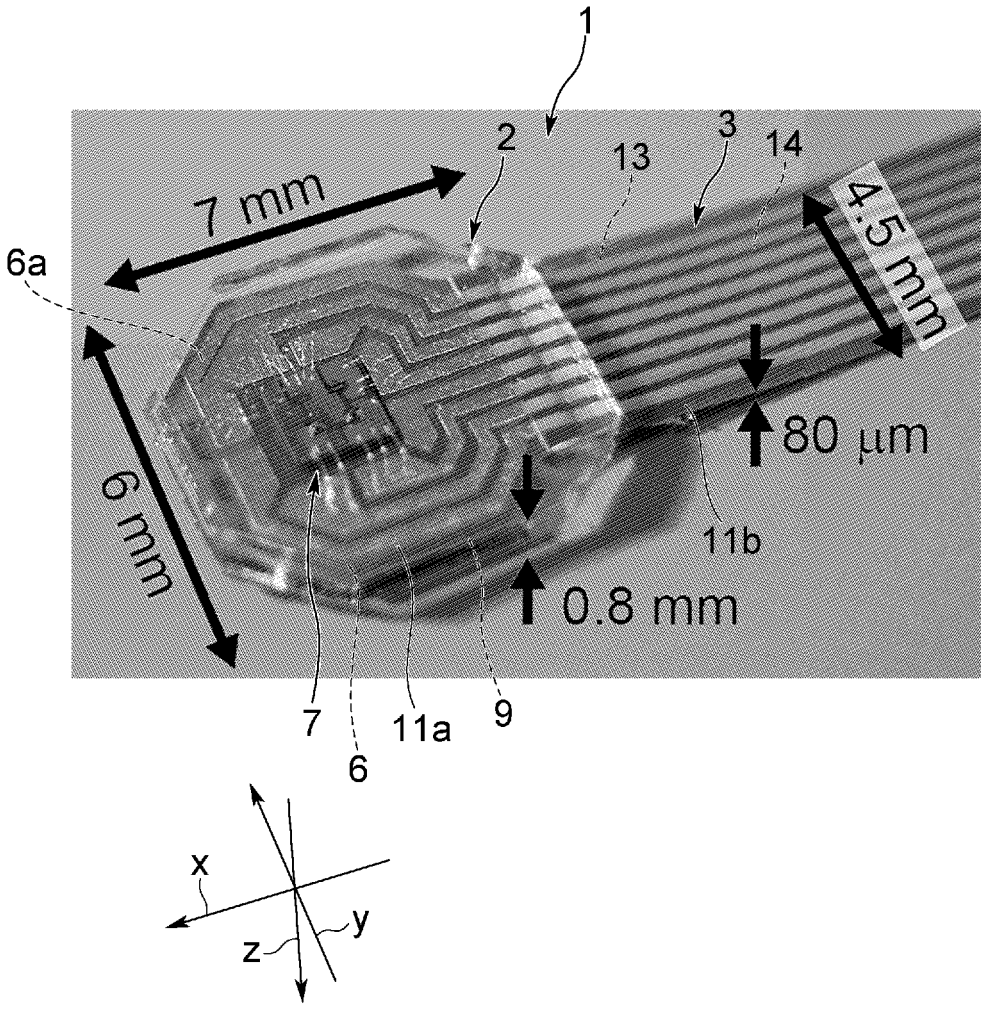
[図1]



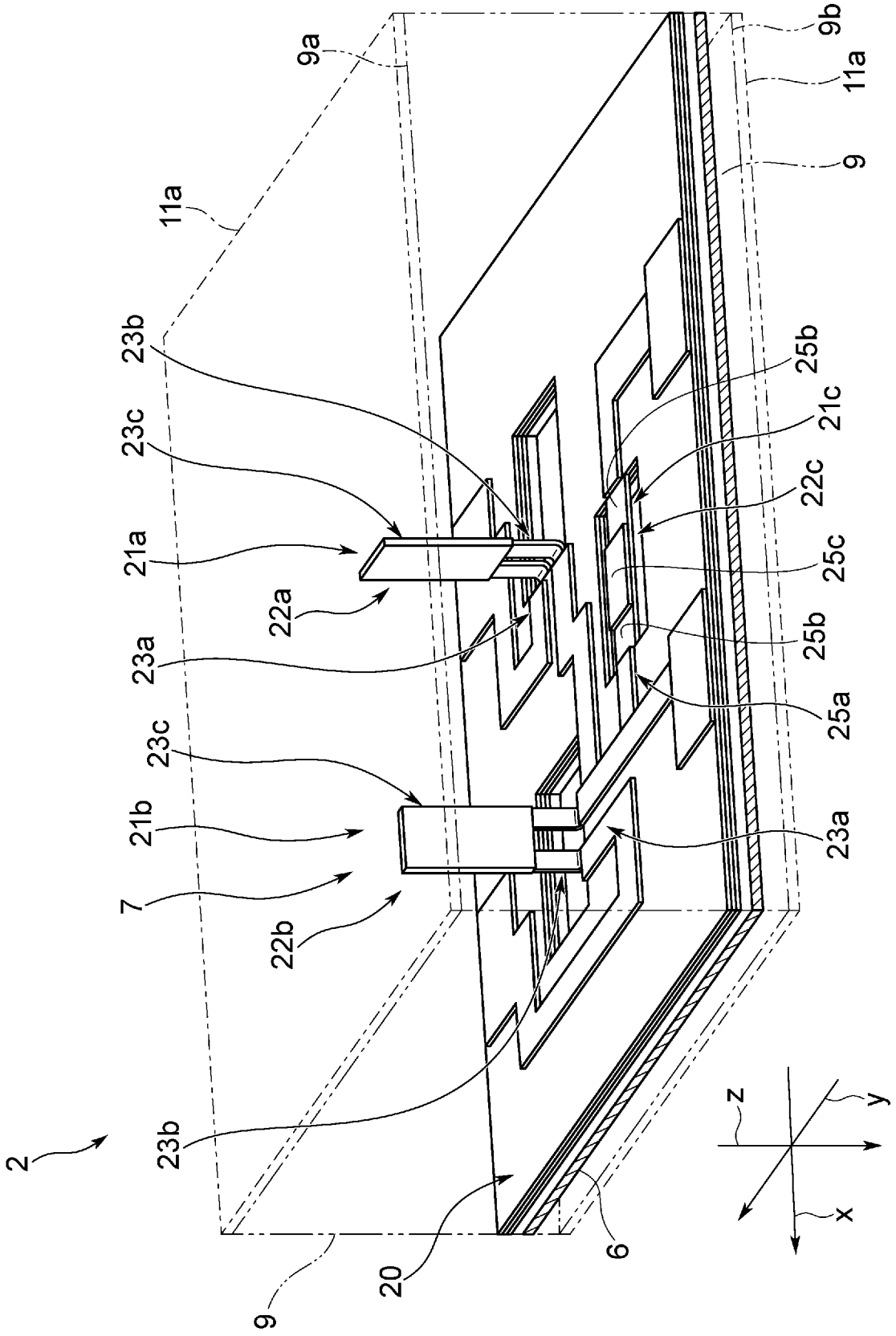
[図2]



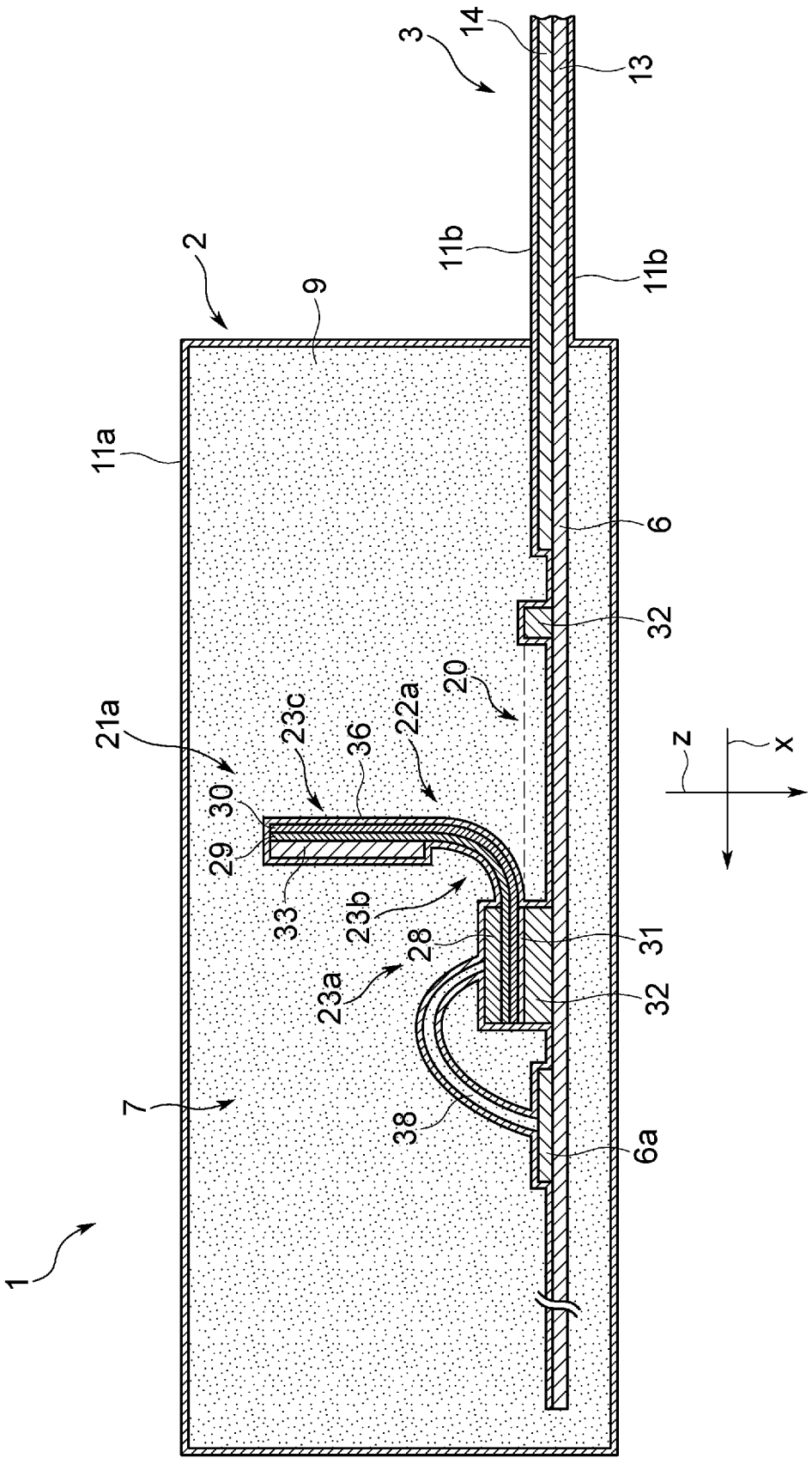
[図3]



[図4]


9a
9b
11a
9
11a
23b
25b
23c
21c
22c
21a
25c
22a
25b
23a
25a
23c
21b
23a
7
22b
23b
2
20
6
9
z
y
x

[図5]


3
14
13
2
11b
11b
9
11a
6
32
20
21a
23c
36
22a
30
29
33
23b
28
31
23a
32
7
38
6a
1
z
x

[図6]

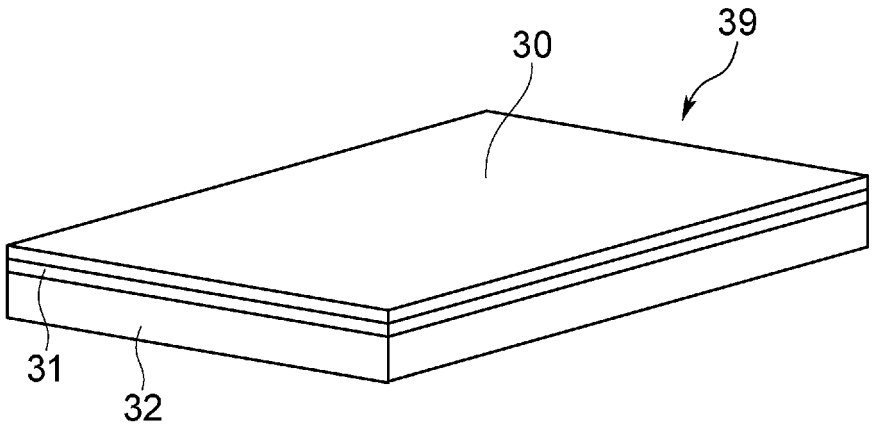


図 6A

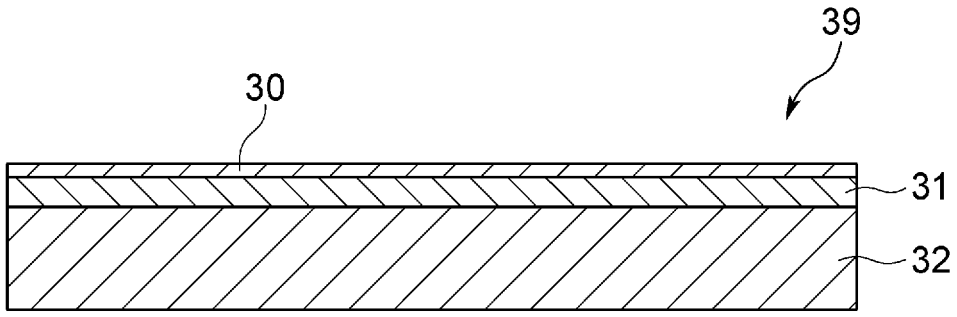


図 6B

[図7]

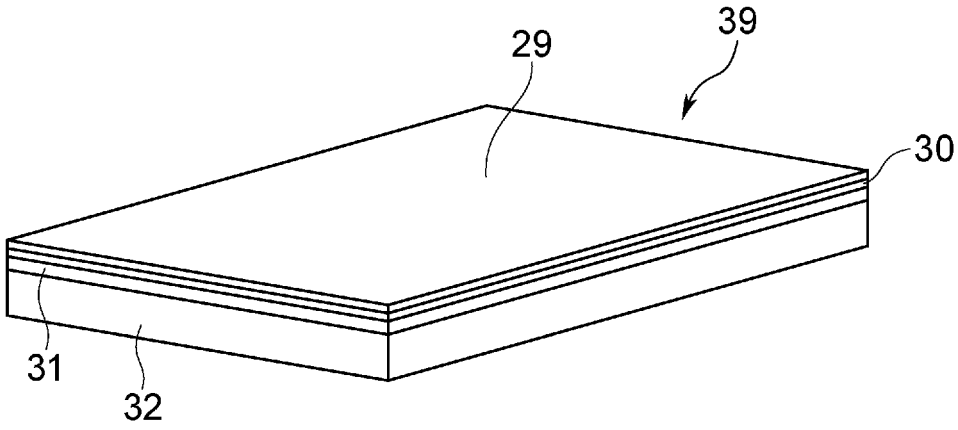


図 7A

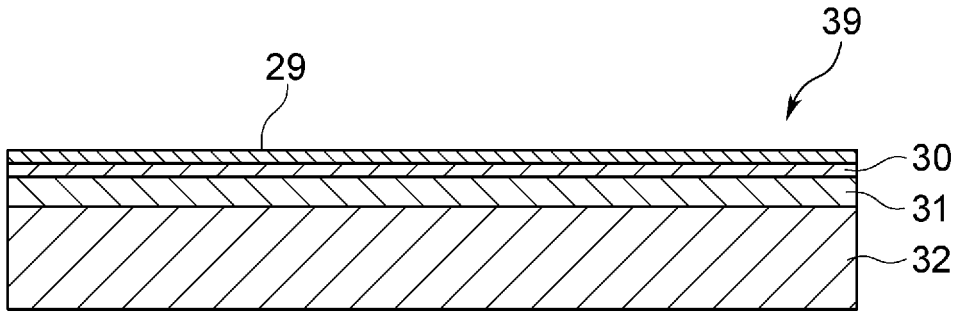


図 7B

[図8]

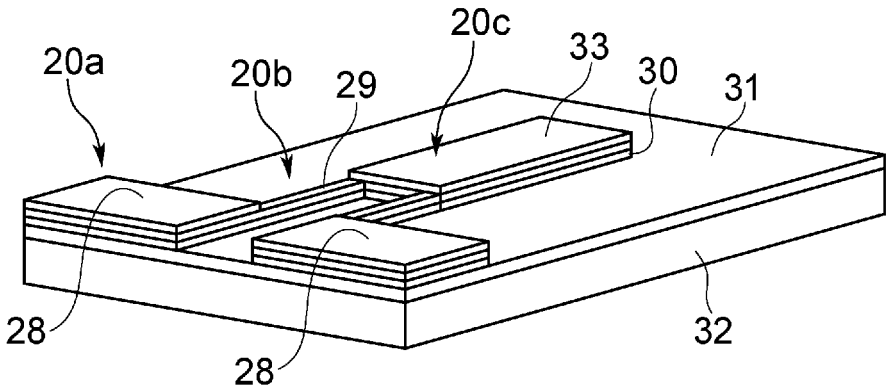


図 8A

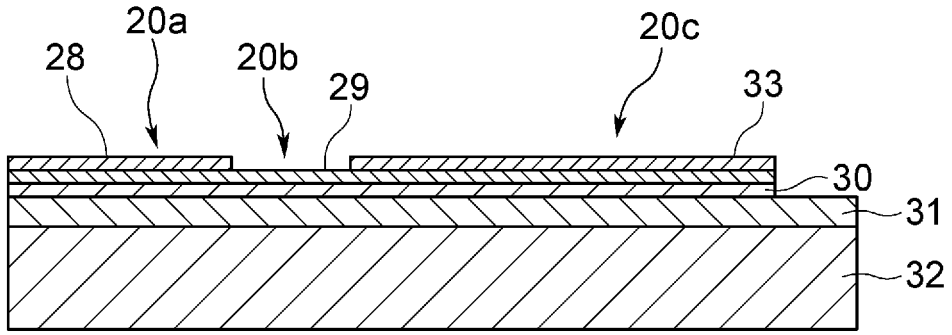


図 8B

[図9]

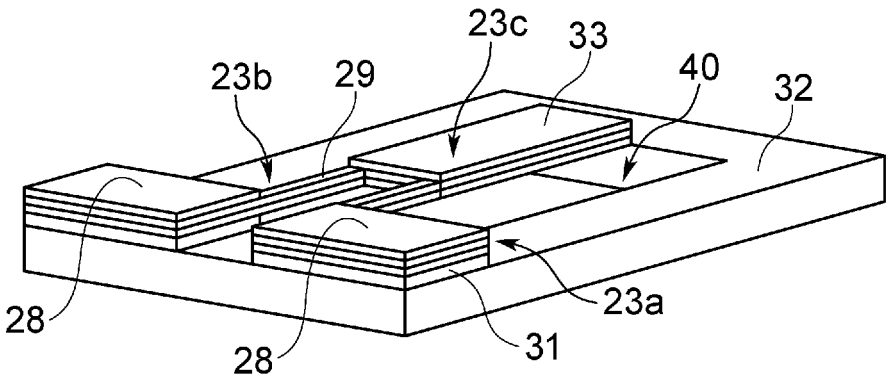


図 9A

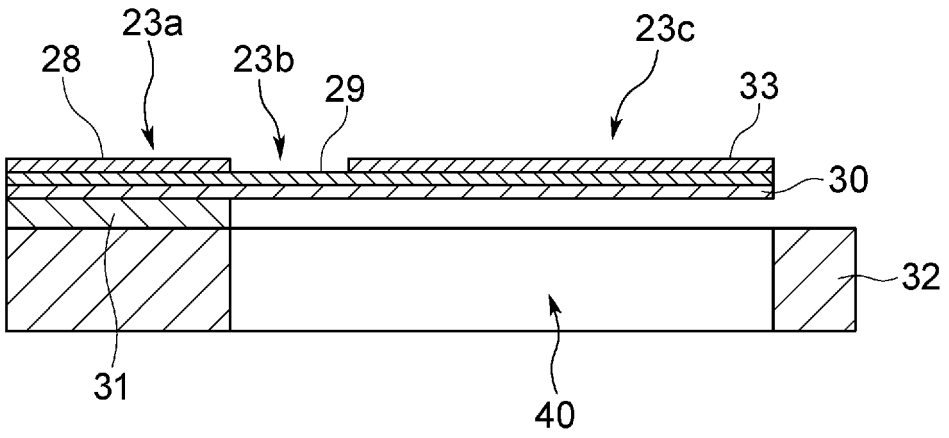
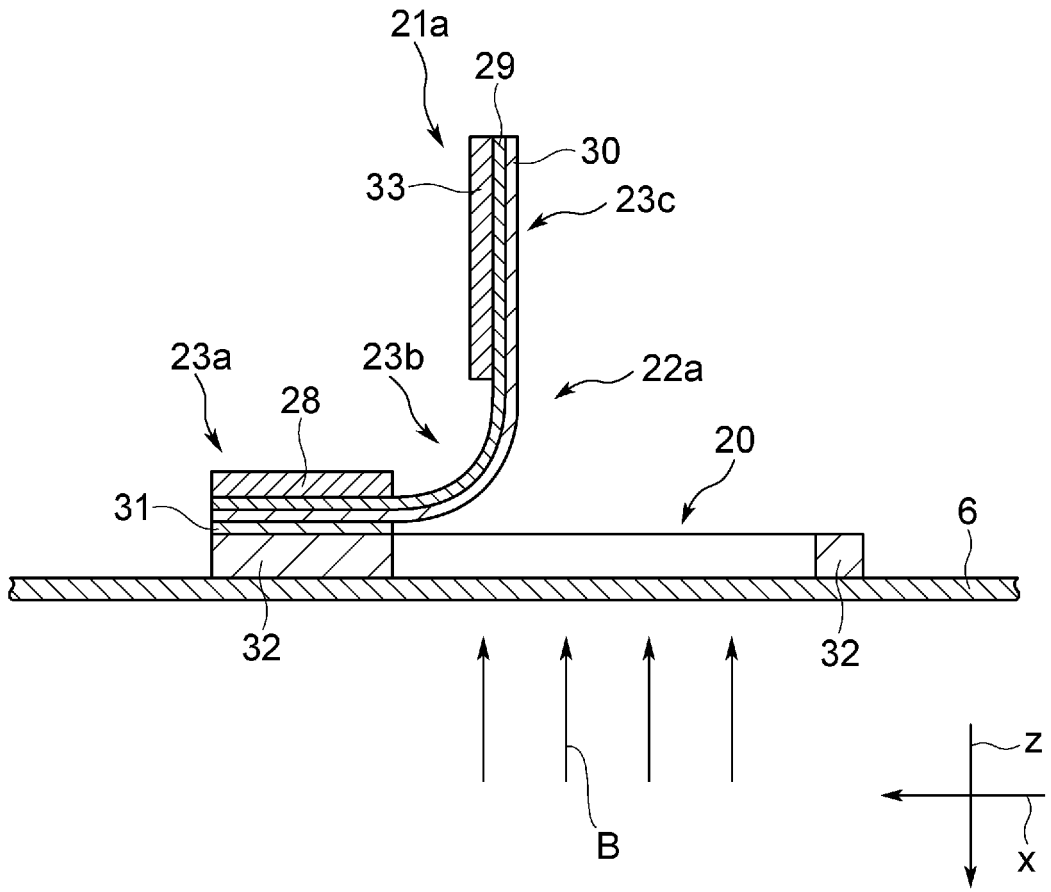
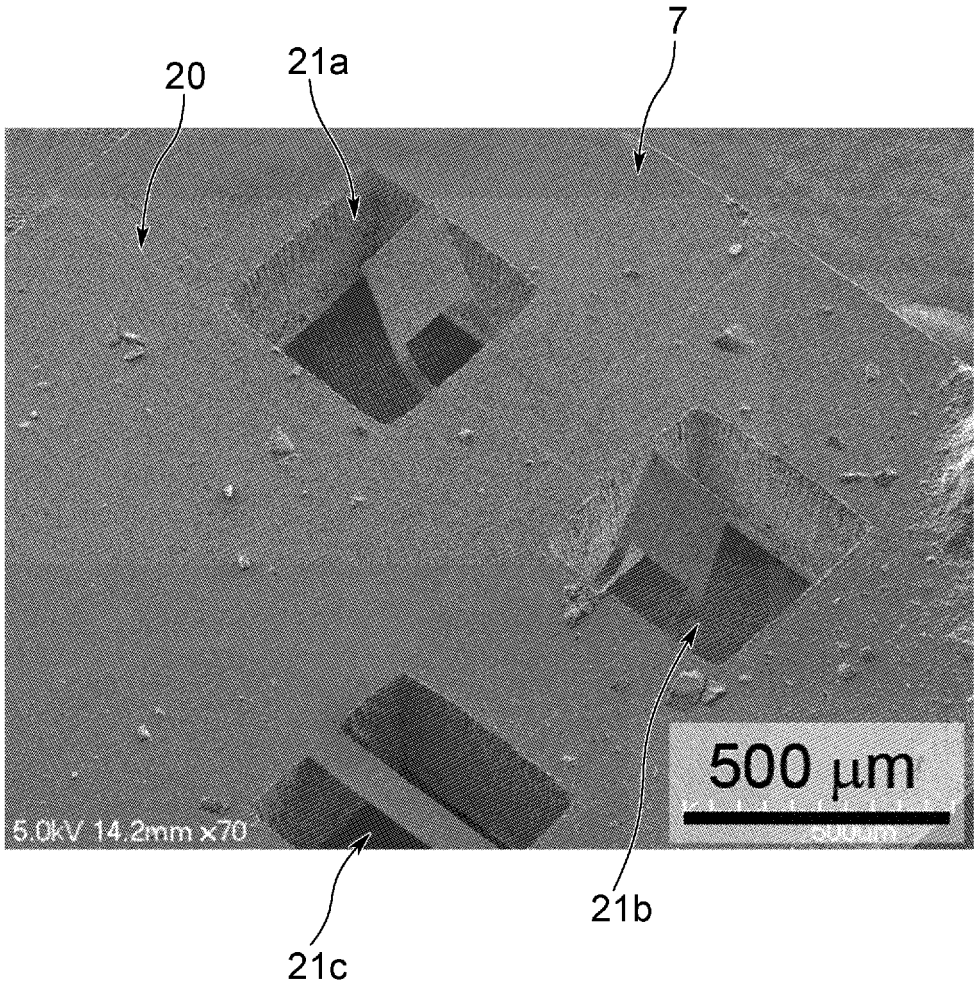


図 9B

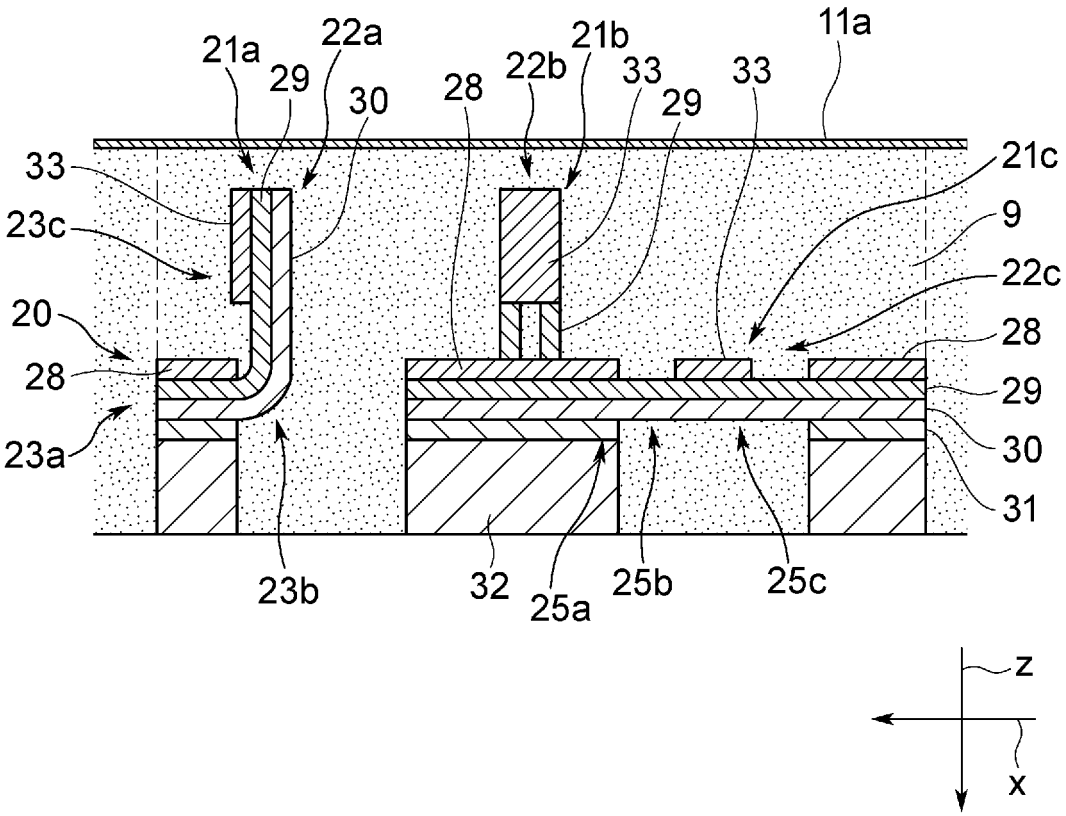
[図10]



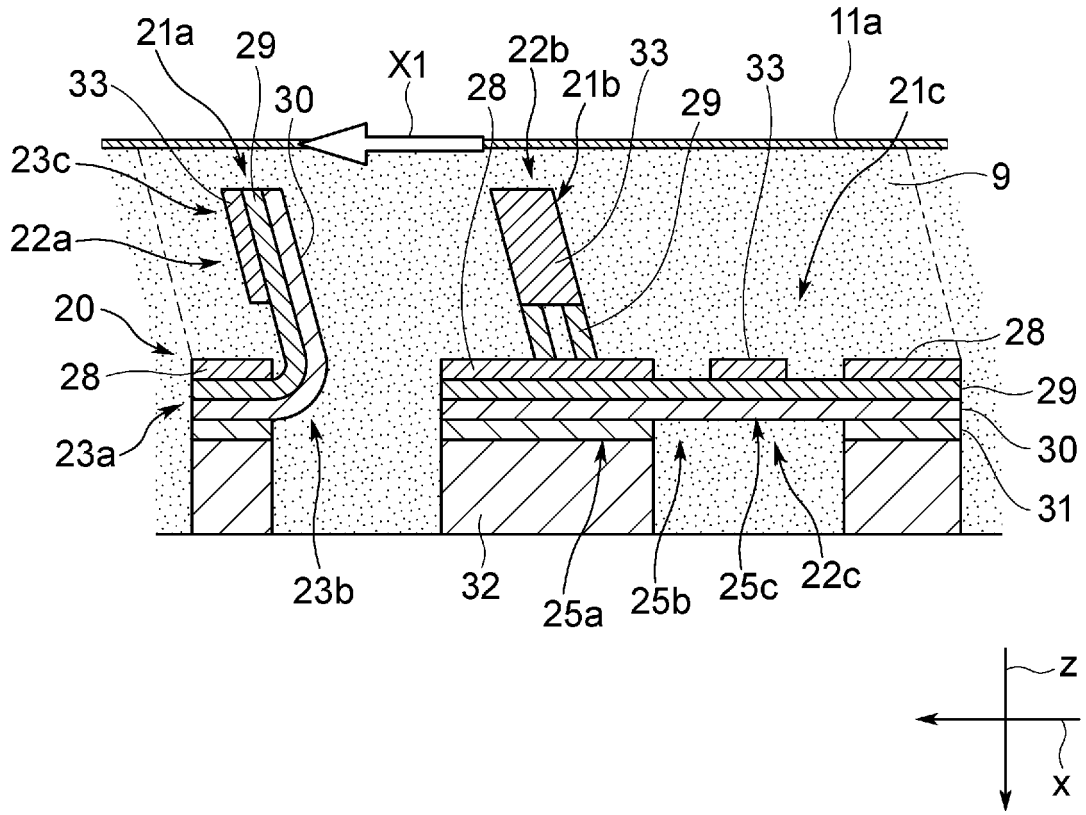
[図11]



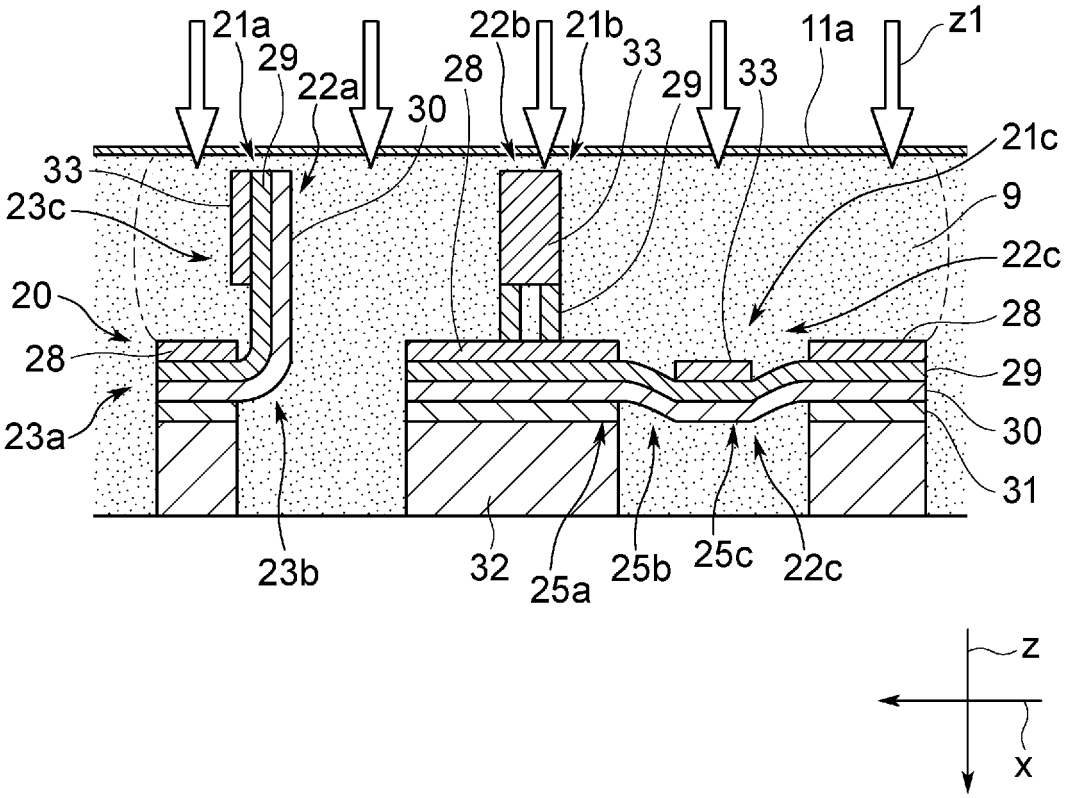
[図12]


21a
22a
29
30
28
22b
21b
33
29
33
11a
33
21c
23c
9
22c
20
28
28
29
23a
30
31
23b
32
25a
25b
25c
z
x

[図13]


21a
29
33
30
X1
28
22b
21b
33
29
33
11a
21c
23c
9
22a
20
28
28
29
23a
30
31
23b
32
25a
25b
25c
22c
z
x

[図14]


21a
29
22a
30
28
22b
21b
33
29
33
11a
z1
21c
9
22c
28
29
30
31
33
23c
20
28
23a
23b
32
25a
25b
25c
22c
z
x

[図15]

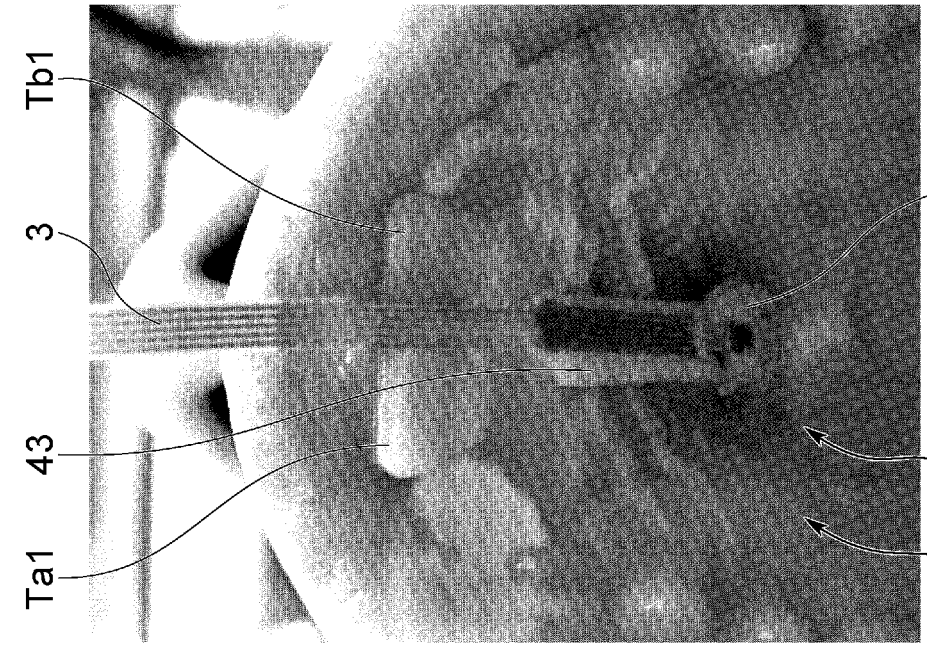


図 15B

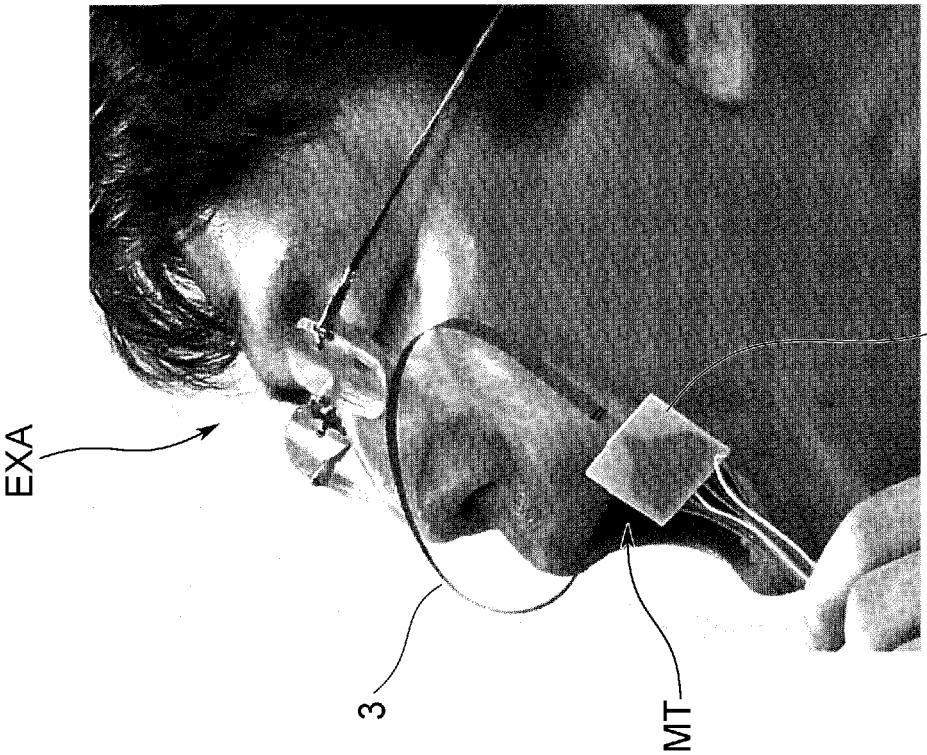
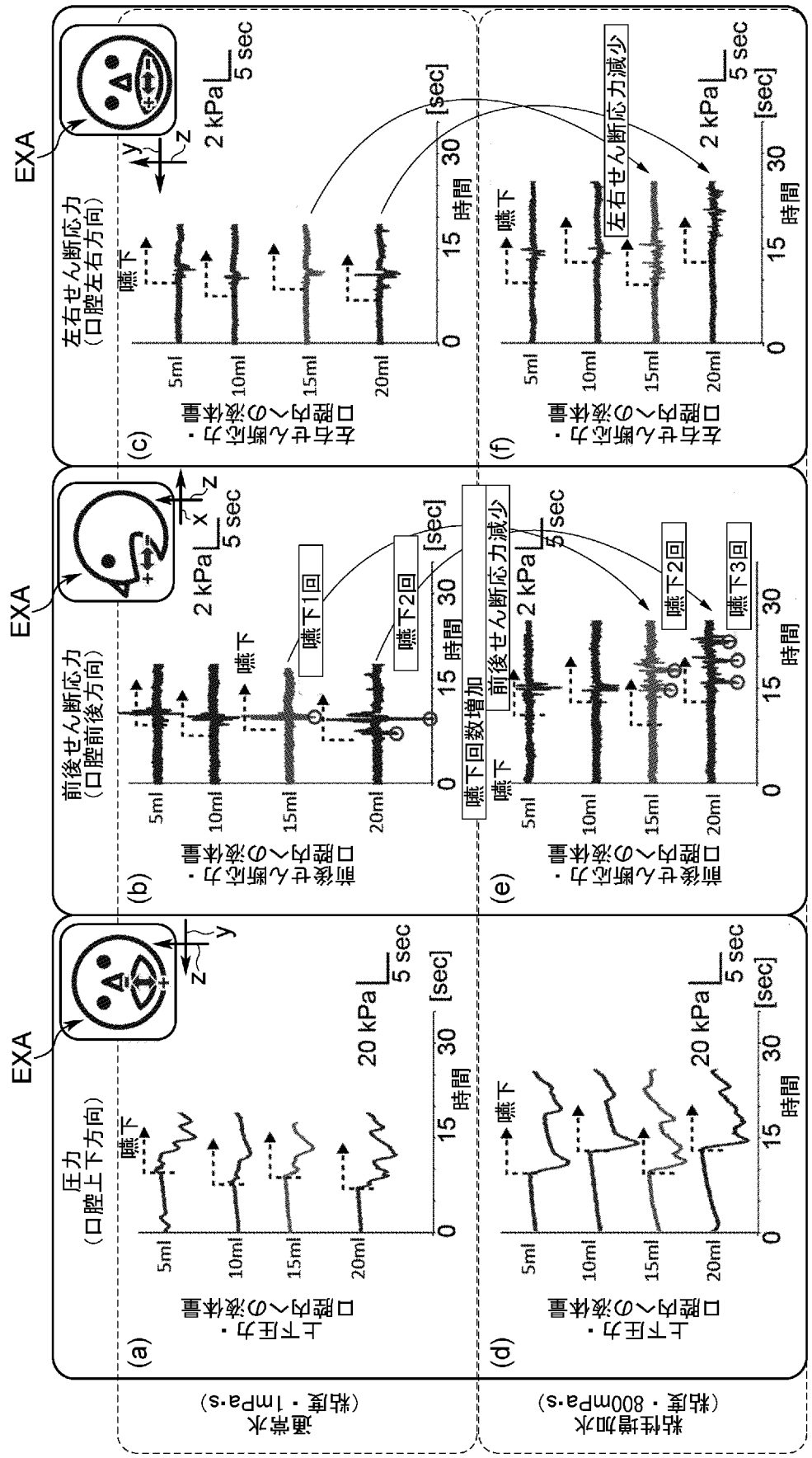
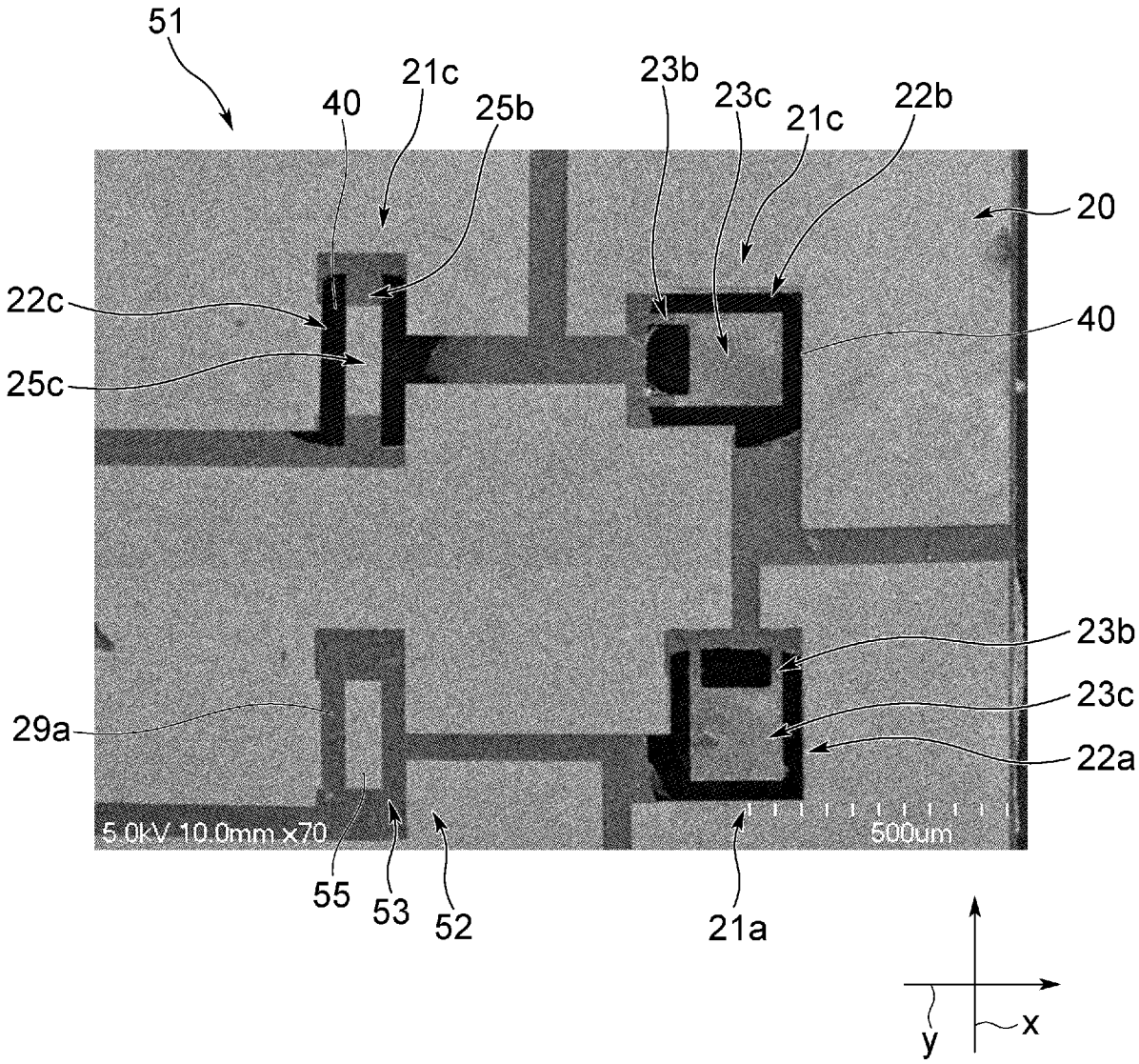


図 15A

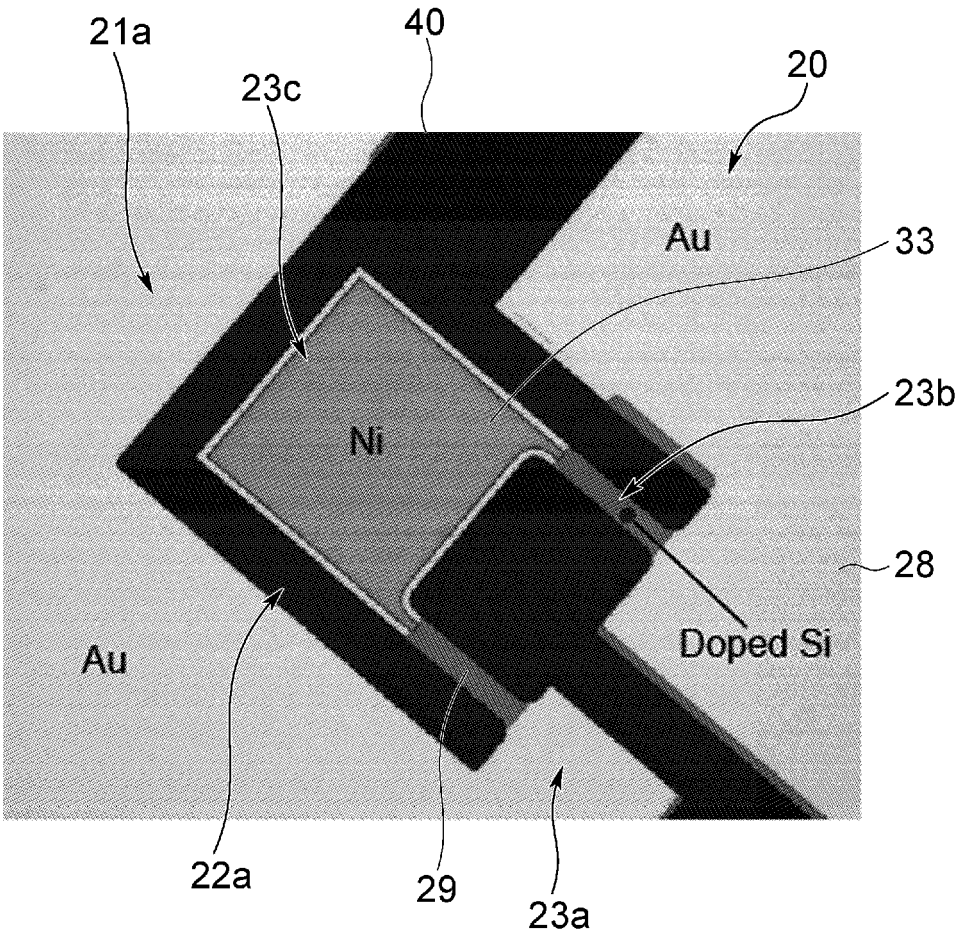
[図16]


通常水
（粘度・1mPa・s）
粘性増加水
（粘度・800mPa・s）
EXA
圧力
（口腔上下方向）
前後せん断応力
（口腔前後方向）
左右せん断応力
（口腔左右方向）
(a)
(b)
(c)
(d)
(e)
(f)
上下圧力・
口腔内への液体量
前後せん断応力・
口腔内への液体量
左右せん断応力・
口腔内への液体量
嚥下
嚥下1回
嚥下2回
嚥下3回
嚥下回数増加
前後せん断応力減少
左右せん断応力減少
5ml
10ml
15ml
20ml
0
15
30
時間
[sec]
20 kPa
2 kPa
5 sec

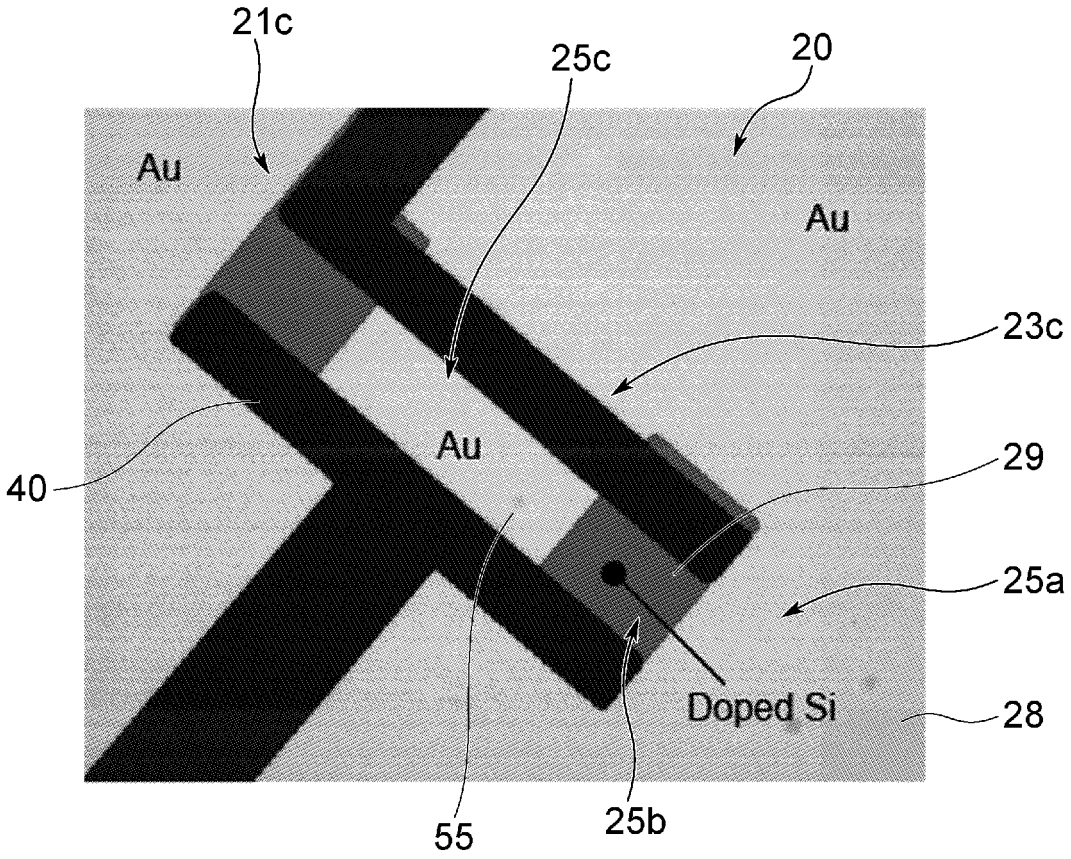
[図17]


51
21c
40
25b
23b
23c
21c
22b
20
22c
25c
40
23b
23c
22a
29a
5.0kV 10.0mm x70
500um
55
53
52
21a
y
x

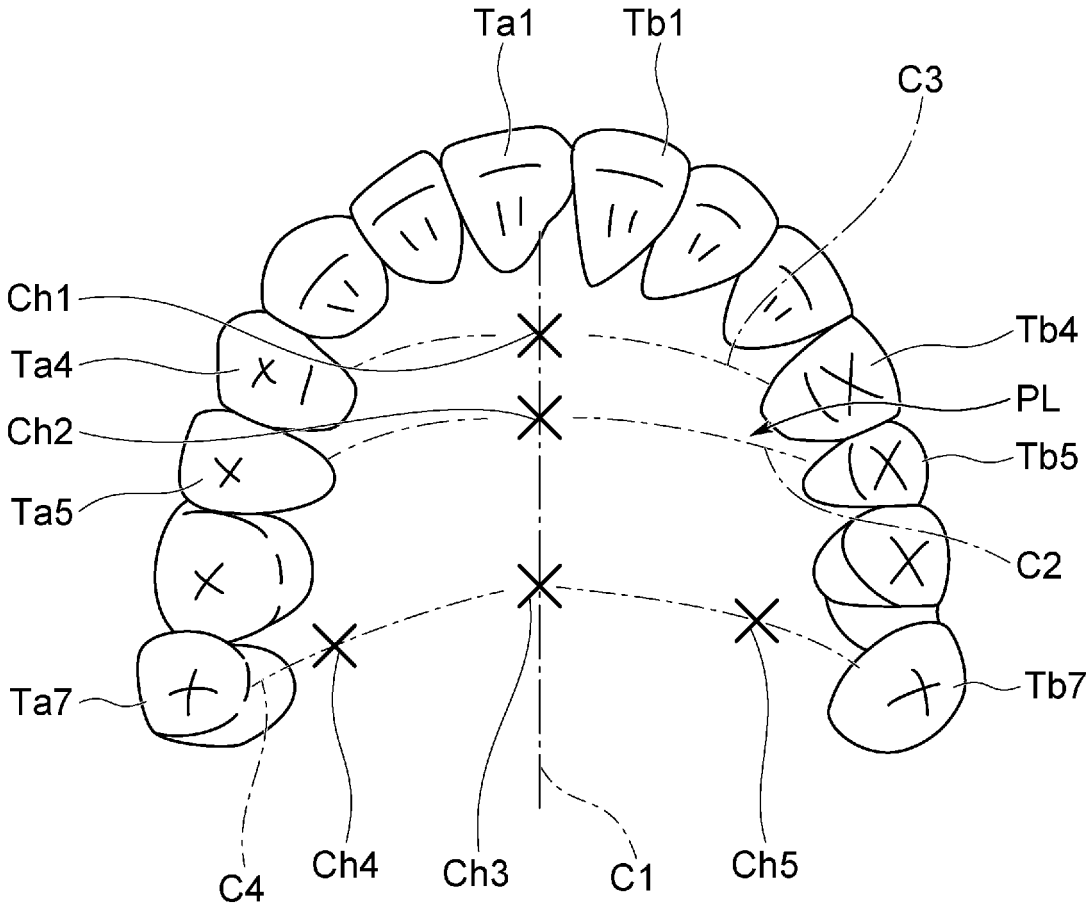
[図18]



[図19]



[図20]



[図21]

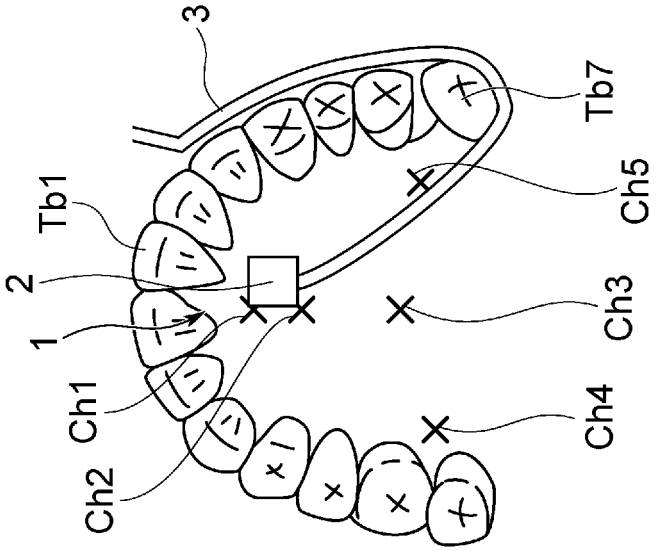


図 21C

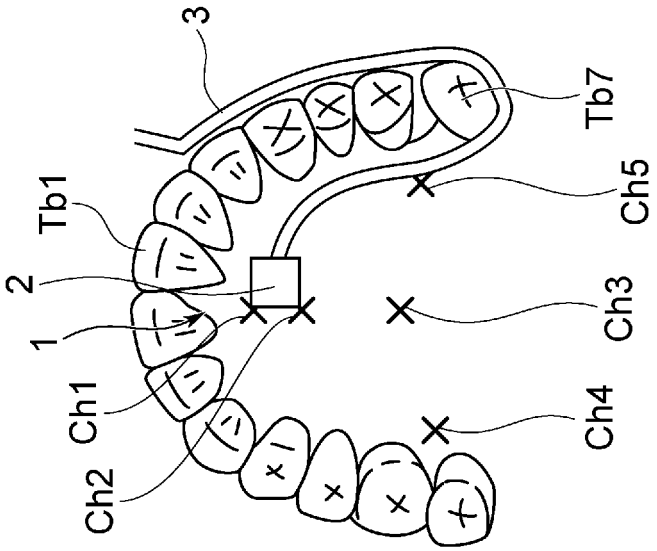


図 21B

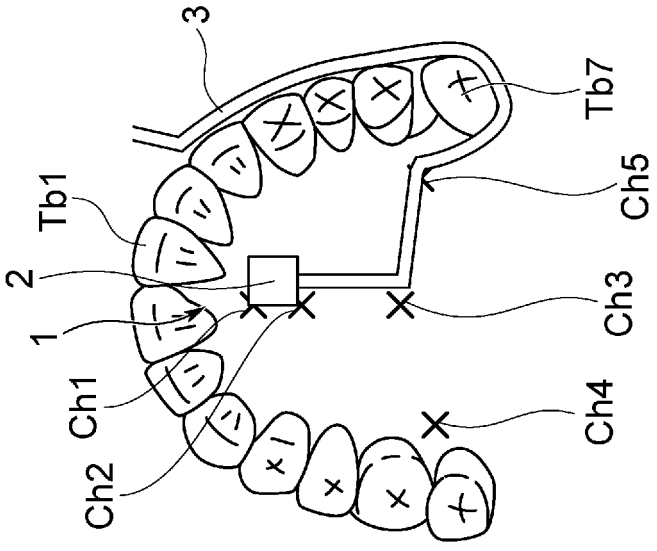
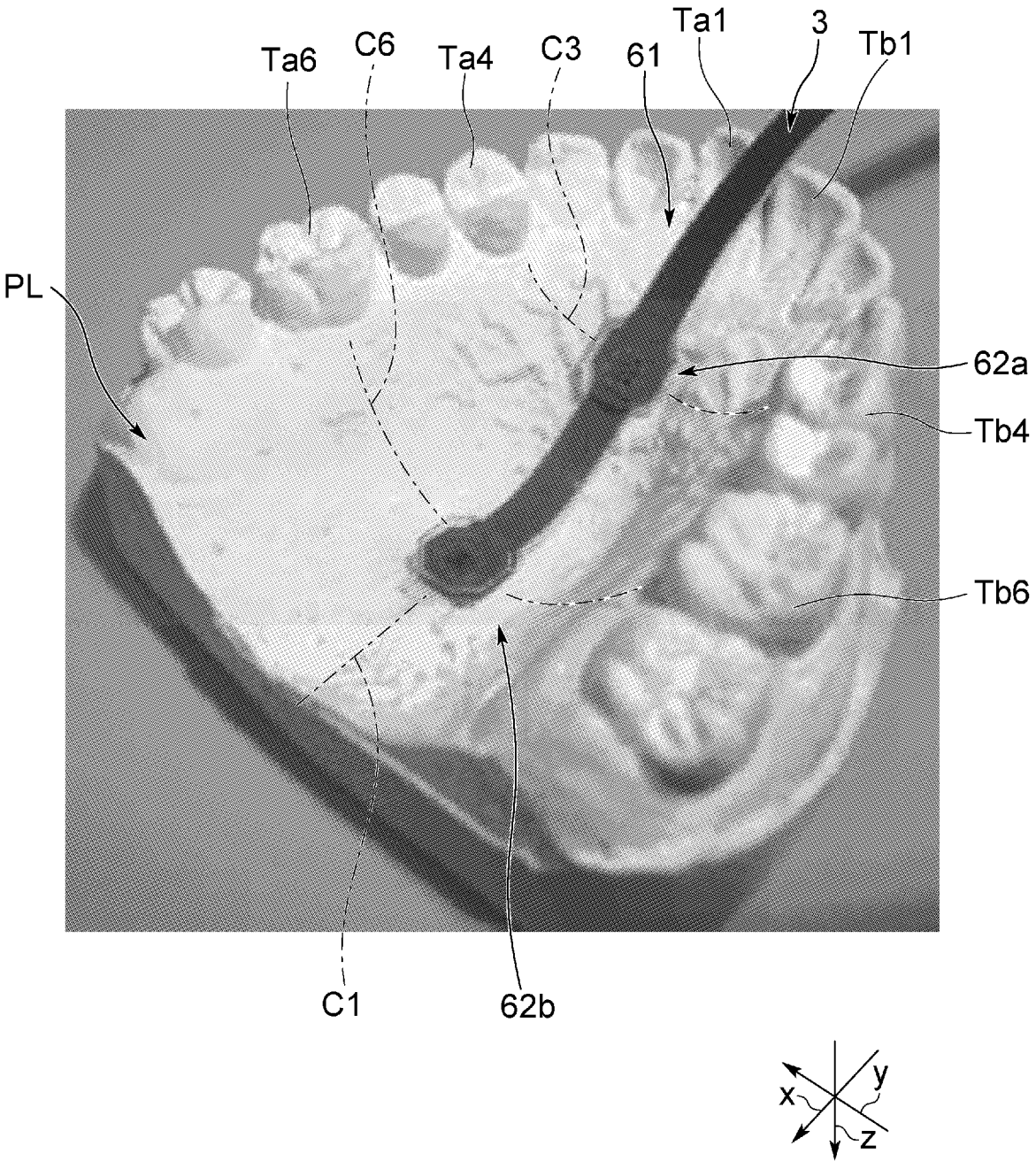
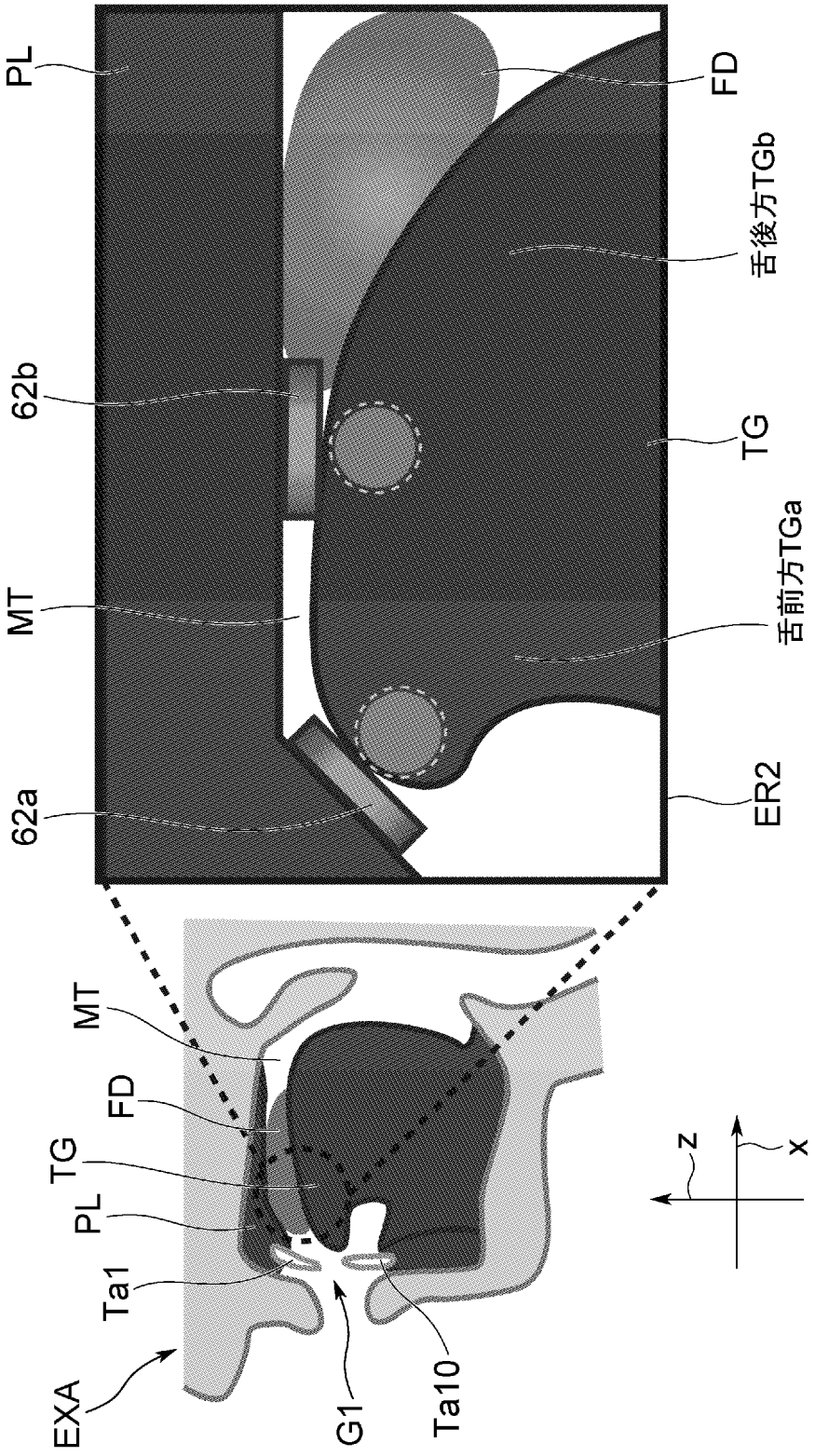


図 21A

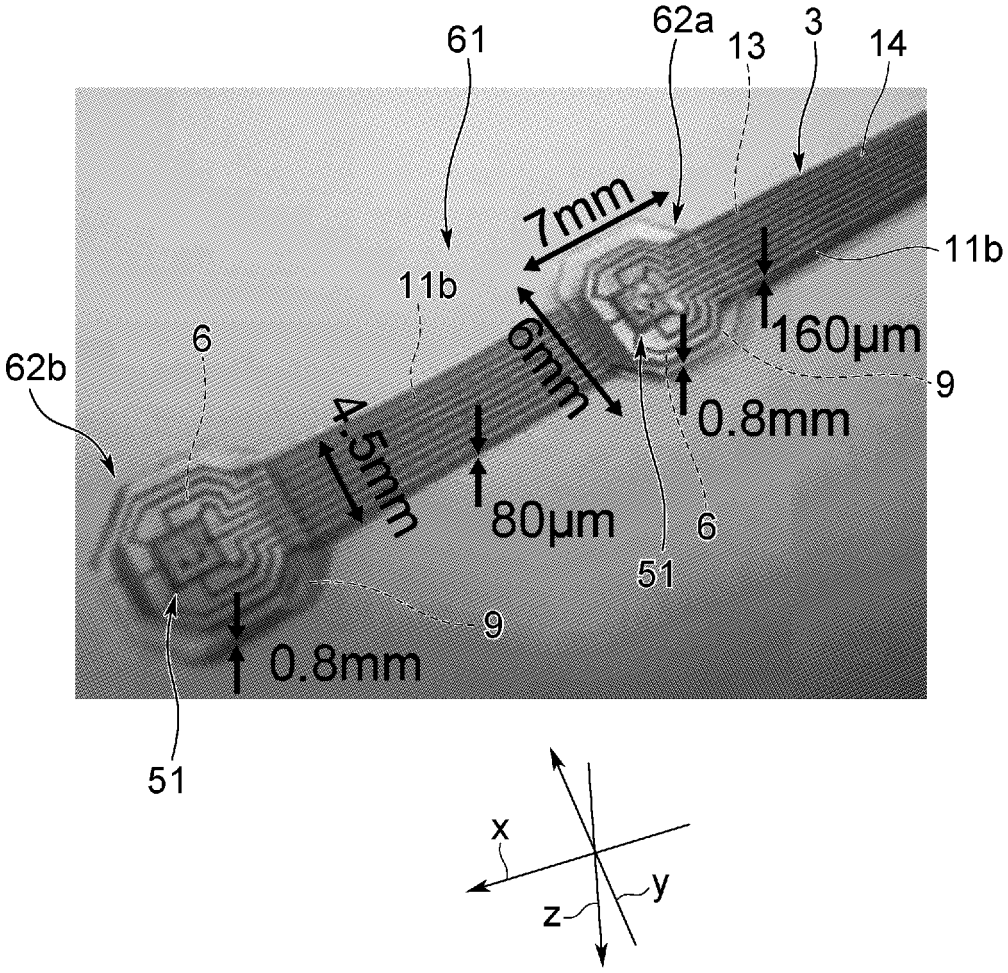
[図22]



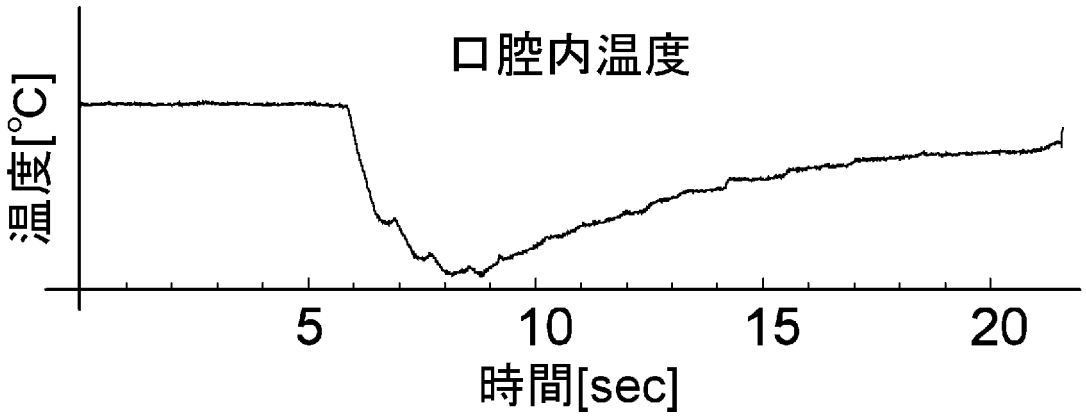
[図23]


PL
FD
舌後方TGb
62b
TG
MT
舌前方TGa
62a
ER2
MT
FD
TG
PL
Ta1
EXA
G1
Ta10
z
x

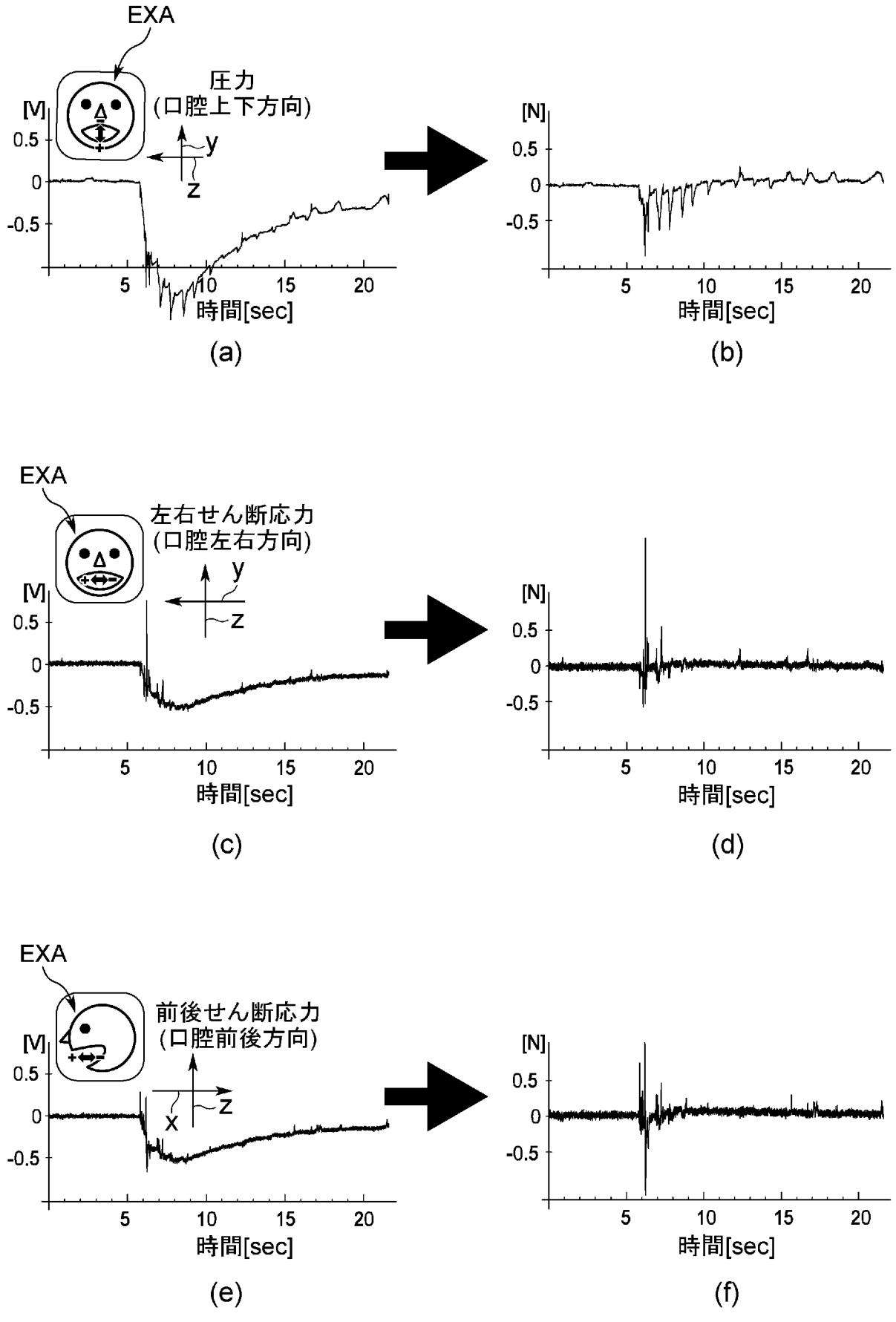
[図24]


61
62a
13
3
14
7mm
11b
11b
160μm
6
62b
6mm
9
4.5mm
0.8mm
80μm
6
51
9
0.8mm
51
x
y
z

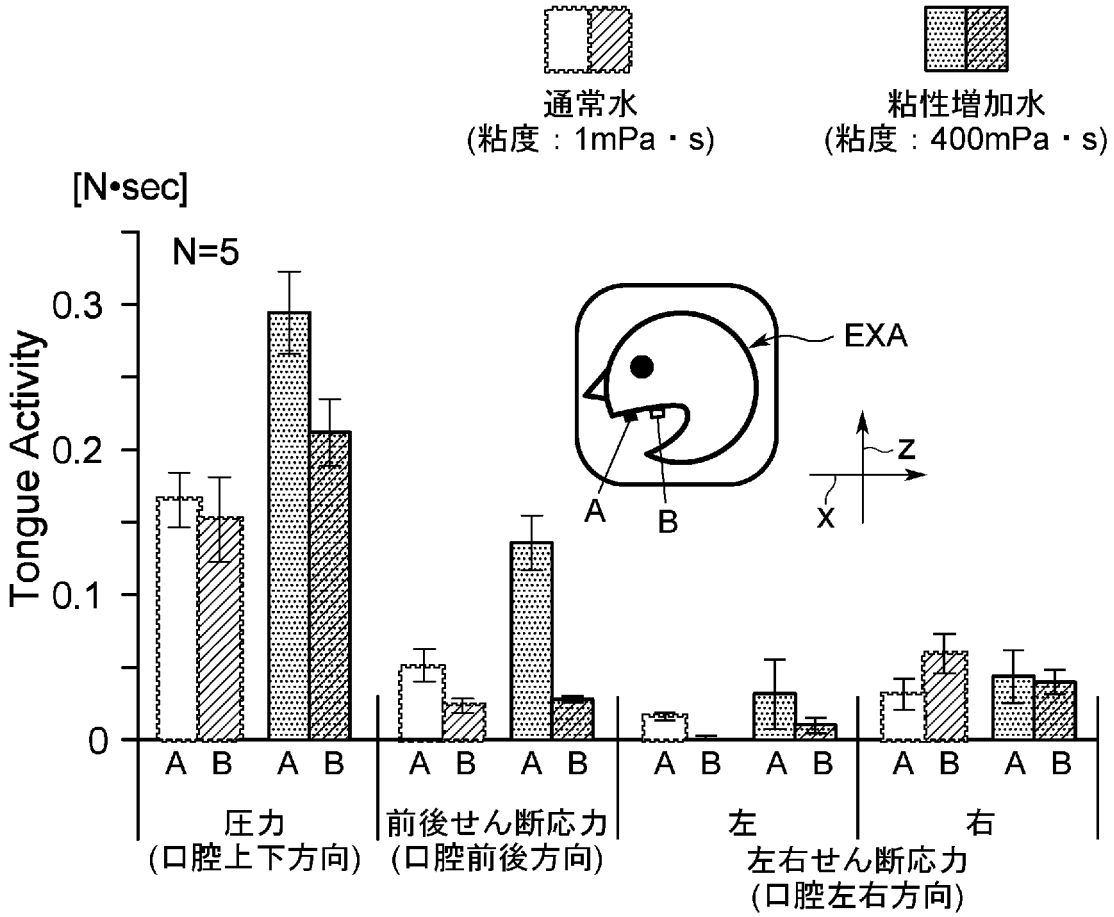
[図25]



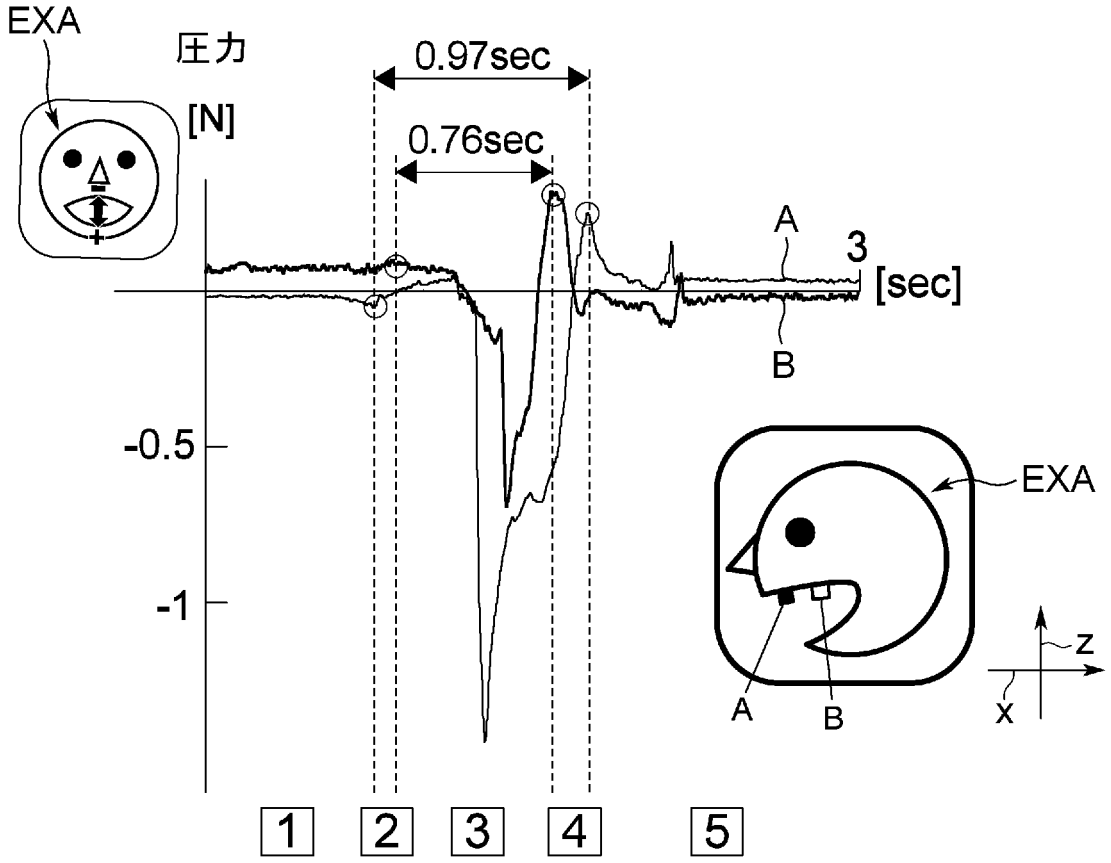
[図26]


EXA
圧力
(口腔上下方向)
[V]
0.5
0
-0.5
y
z
5
10
15
20
時間[sec]
(a)
[N]
0.5
0
-0.5
5
10
15
20
時間[sec]
(b)
EXA
左右せん断応力
(口腔左右方向)
[V]
0.5
0
-0.5
y
z
5
10
15
20
時間[sec]
(c)
[N]
0.5
0
-0.5
5
10
15
20
時間[sec]
(d)
EXA
前後せん断応力
(口腔前後方向)
[V]
0.5
0
-0.5
x
z
5
10
15
20
時間[sec]
(e)
[N]
0.5
0
-0.5
5
10
15
20
時間[sec]
(f)

[図27]


通常水
(粘度：1mPa・s)
粘性増加水
(粘度：400mPa・s)
[N•sec]
N=5
Tongue Activity
0.3
0.2
0.1
0
EXA
A
B
Z
X
A B A B A B A B A B A B A B A B
圧力
(口腔上下方向)
前後せん断応力
(口腔前後方向)
左
右
左右せん断応力
(口腔左右方向)

[図28]



[図29]

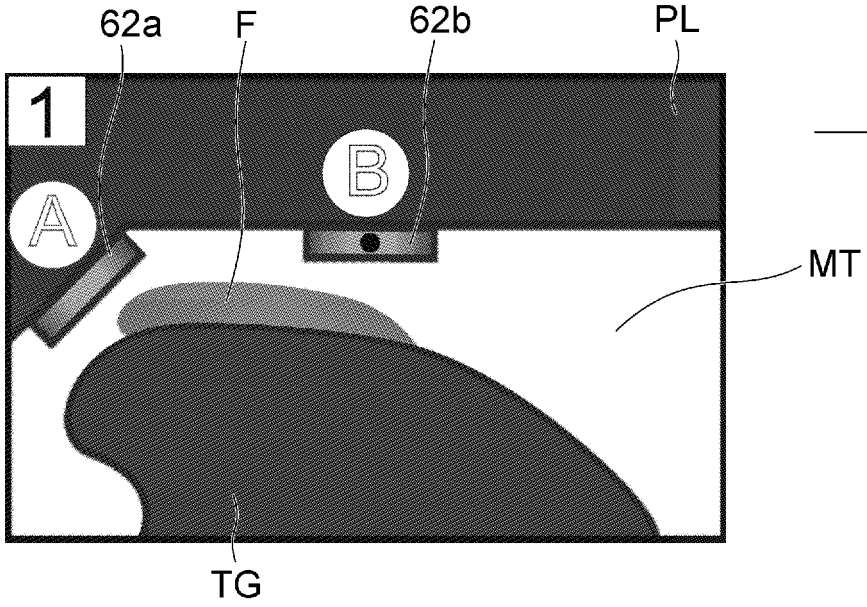


図29A

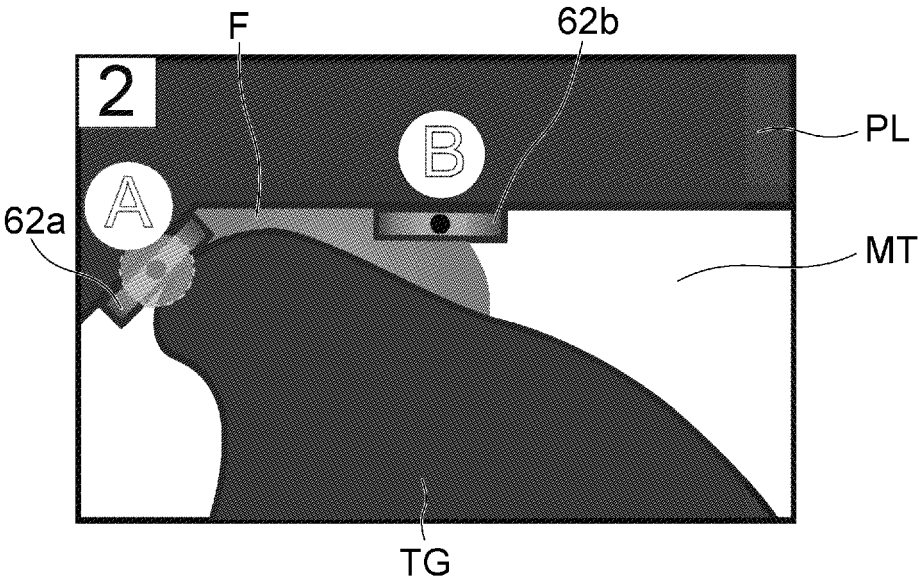


図29B

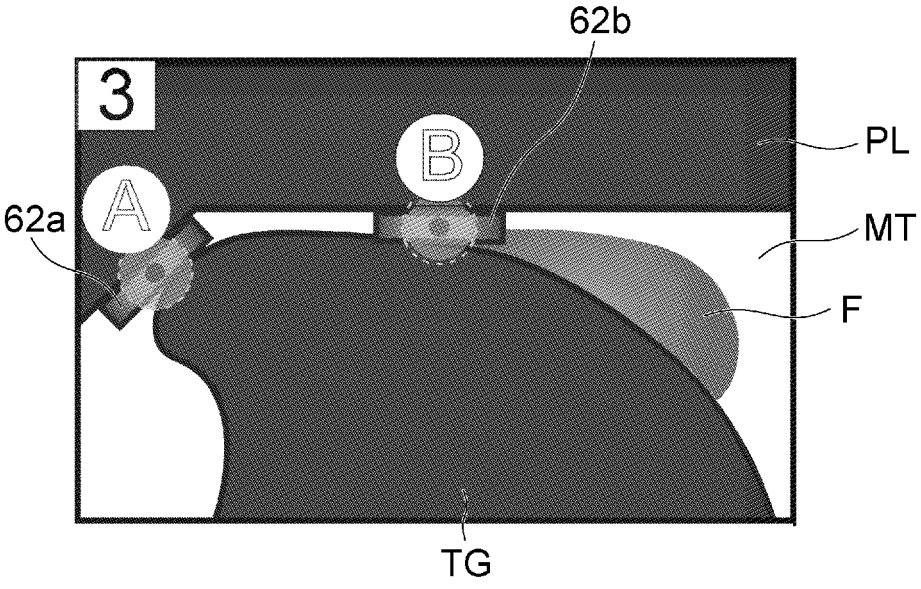


図29C

[図30]

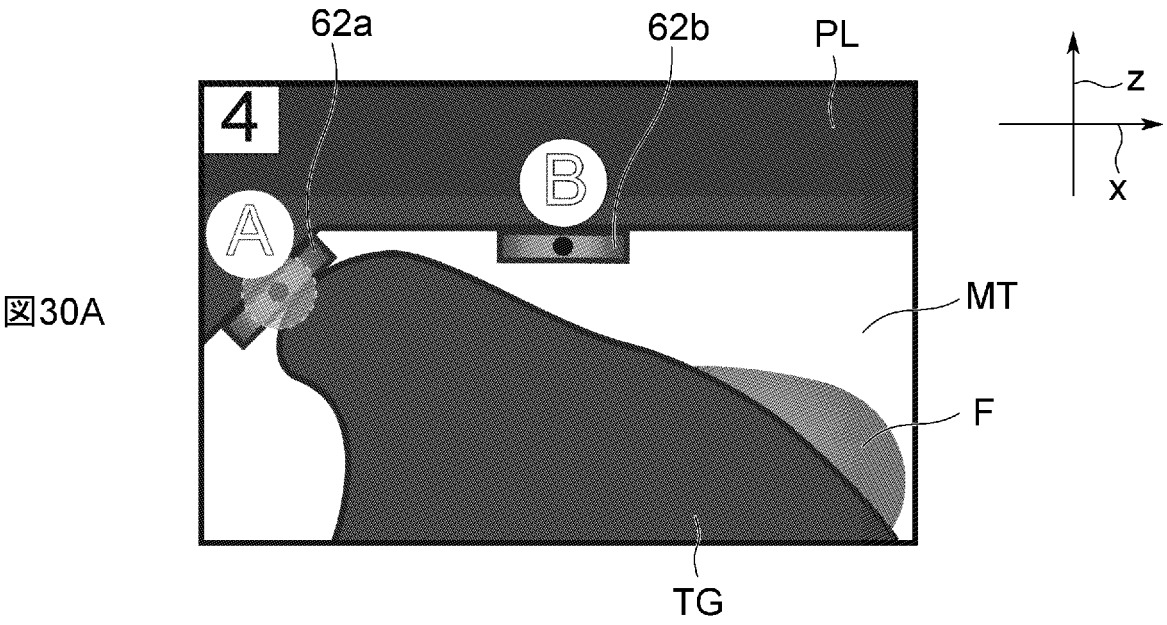


図30A

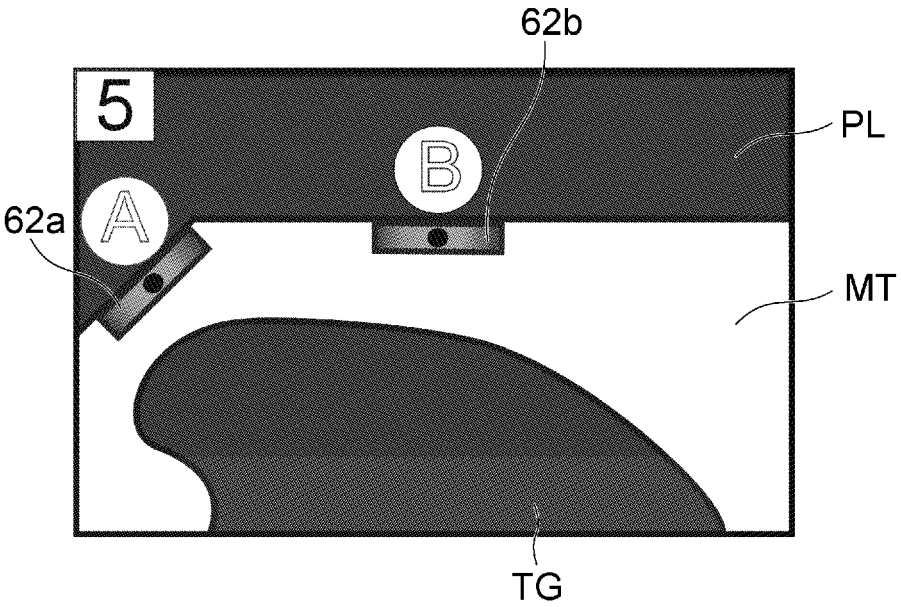


図30B