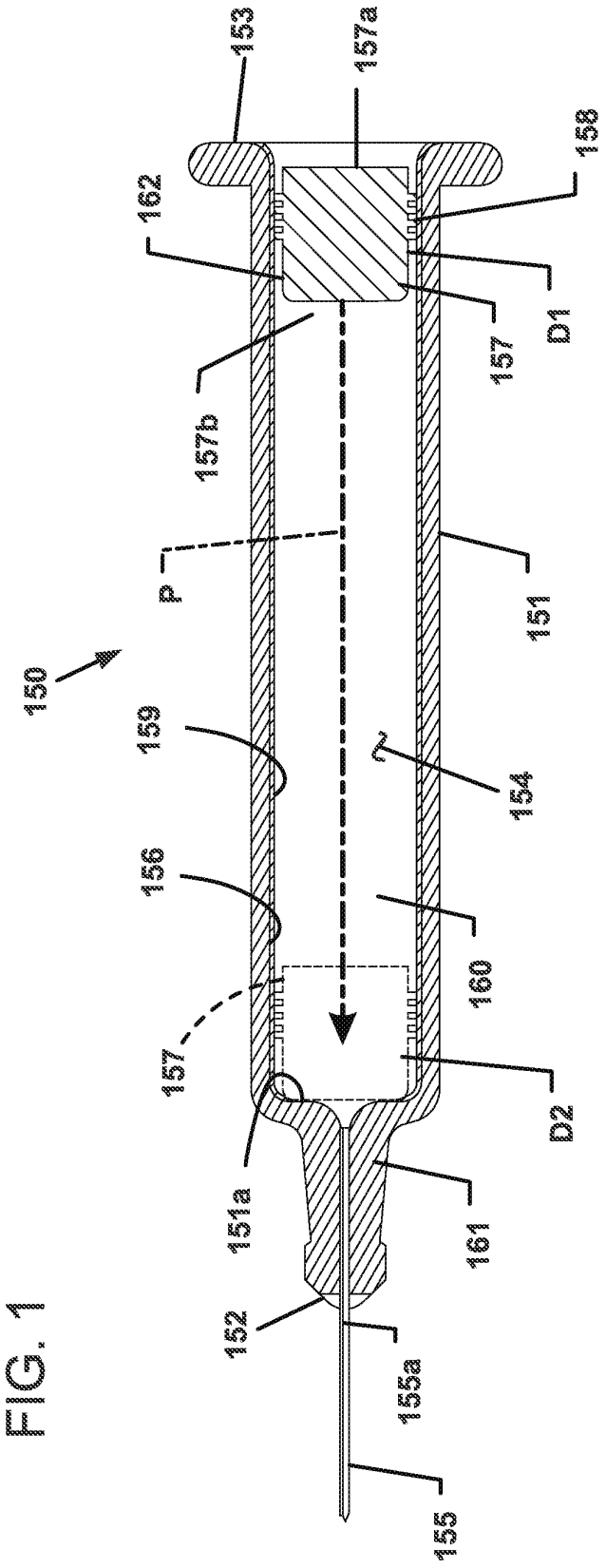

153
157a
158
162
D1
157
157b
P
151
150
159
154
156
160
157
D2
151a
161
152
155a
155

FIG. 1

FIG. 2

SEQ ID NO: 1--Heavy Chain Variable Region of Humanized Antibody

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr

Trp Ile Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val

Ala Glu Ile Arg Ser Glu Ser Asp Ala Ser Ala Thr His Tyr Ala Glu

Ala Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser

Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr

Tyr Cys Leu Ala Tyr Phe Asp Tyr Gly Leu Ala Ile Gln Asn Tyr Trp

Gly Gln Gly Thr Leu Val Thr Val Ser Ser

SEQ ID NO: 2--Light Chain Variable Region of Humanized Antibody

Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly

Glu Arg Ala Thr Leu Ser Cys Lys Ala Ser Lys Arg Val Thr Thr Tyr

Val Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile

Tyr Gly Ala Ser Asn Arg Tyr Leu Gly Ile Pro Ala Arg Phe Ser Gly

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro

Glu Asp Phe Ala Val Tyr Tyr Cys Ser Gln Ser Tyr Asn Tyr Pro Tyr

Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys

SEQ ID NO: 3--CDR H1 of Humanized Antibody

Gly Phe Thr Phe Ser Asn Tyr Trp Ile Ser

SEQ ID NO: 4--CDR H2 of Humanized Antibody

Glu Ile Arg Ser Glu Ser Asp Ala Ser Ala Thr His Tyr Ala Glu Ala

SEQ ID NO: 5--CDR H3 of Humanized Antibody

Tyr Phe Asp Tyr Gly Leu Ala Ile Gln Asn Tyr

SEQ ID NO: 6--CDR L1 of Humanized Antibody

Lys Ala Ser Lys Arg Val Thr Thr Tyr Val Ser

SEQ ID NO: 7--CDR L2 of Humanized Antibody

Gly Ala Ser Asn Arg Tyr Leu

SEQ ID NO: 8--CDR L3 of Humanized Antibody

Ser Gln Ser Tyr Asn Tyr Pro Tyr Thr

FIG. 3A

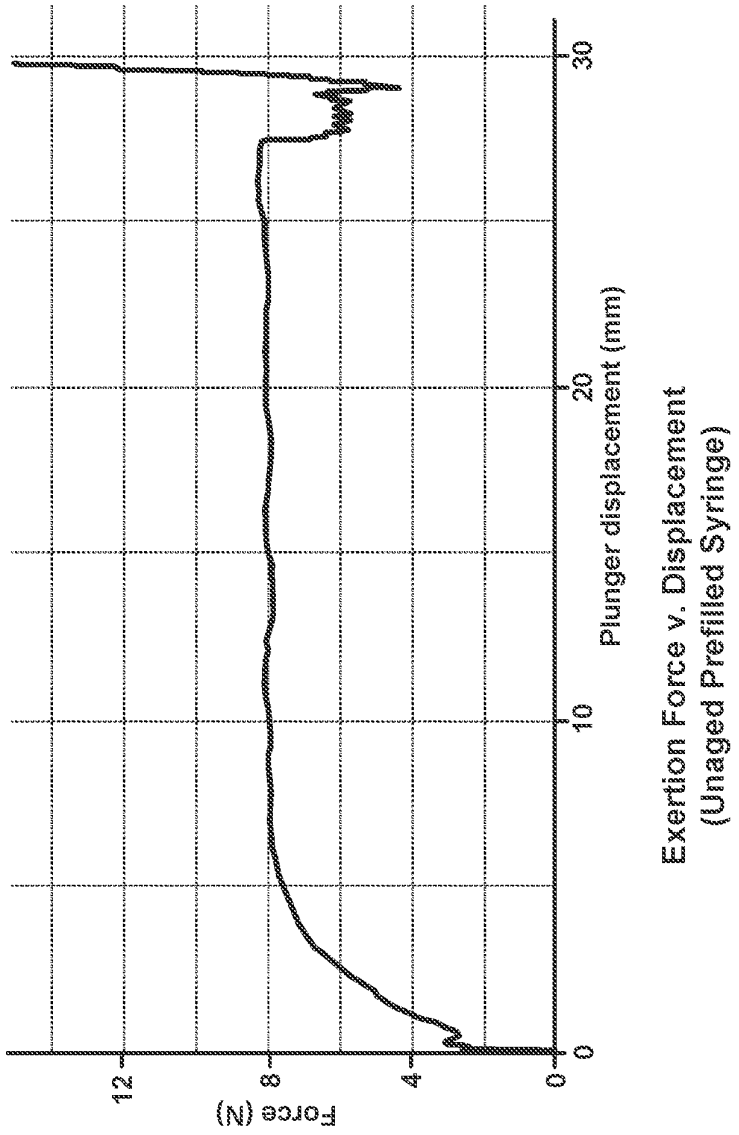

Force (N)
0
4
8
12
0
10
20
30
Plunger displacement (mm)
Exertion Force v. Displacement
(Unaged Prefilled Syringe)

FIG. 3B

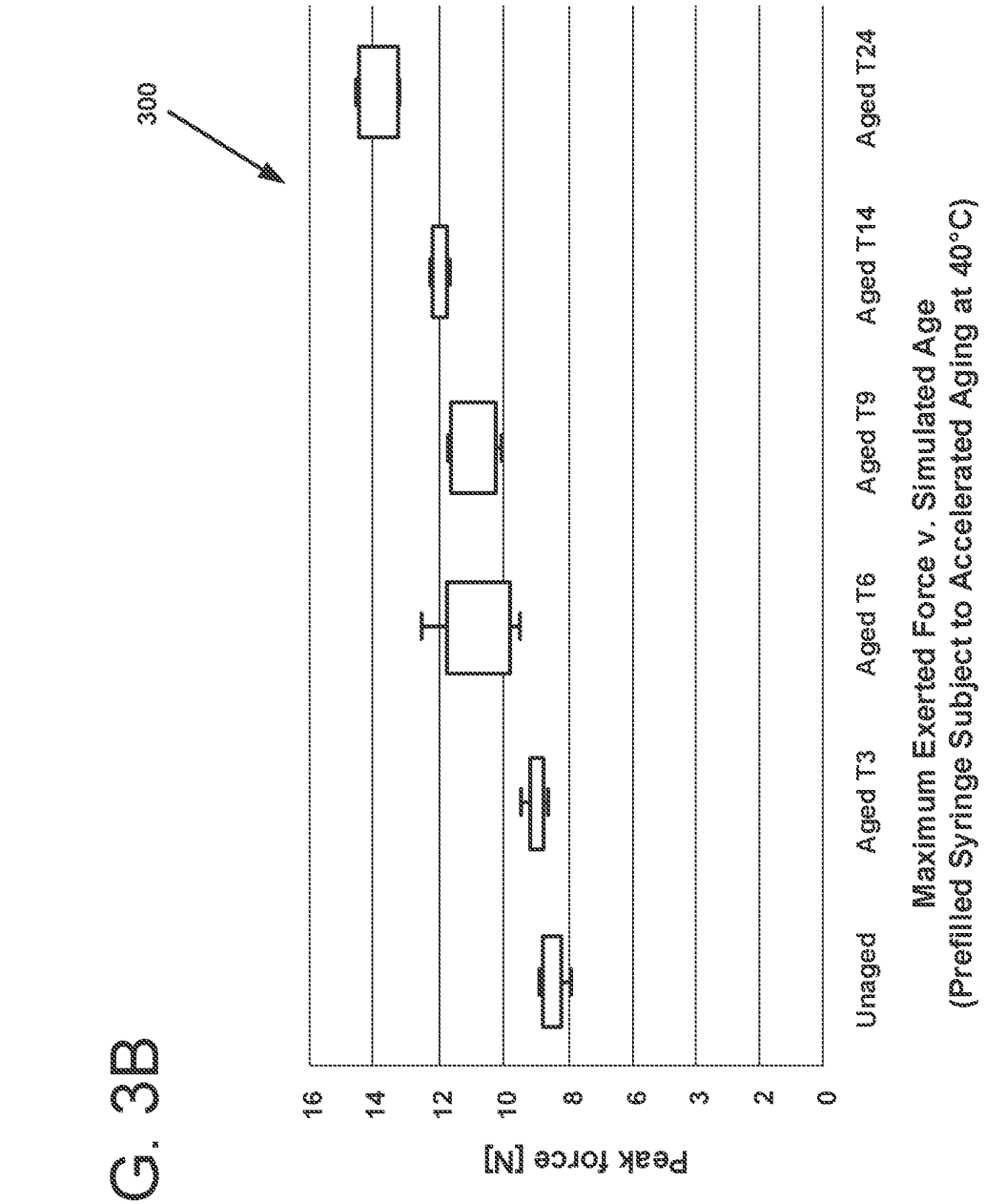

300
16
14
12
10
8
6
3
2
0
Peak force [N]
Unaged
Aged T3
Aged T6
Aged T9
Aged T14
Aged T24
Maximum Exerted Force v. Simulated Age
(Prefilled Syringe Subject to Accelerated Aging at 40°C)

FIG. 3C

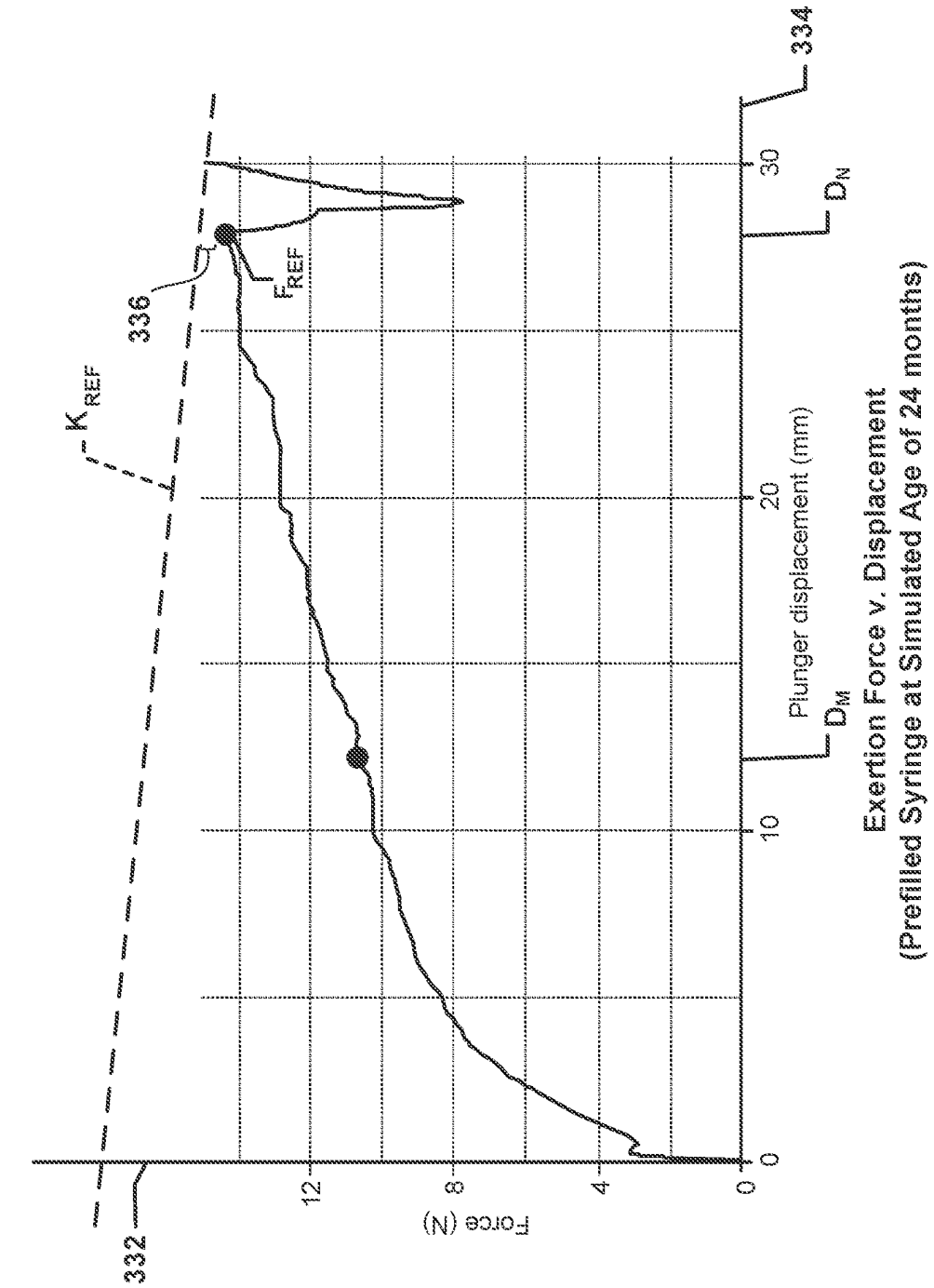

Exertion Force v. Displacement
(Prefilled Syringe at Simulated Age of 24 months)
Force (N)
Plunger displacement (mm)
0
4
8
12
0
10
20
30
D_M
D_N
F_{REF}
K_{REF}
332
336
334

FIG. 3D

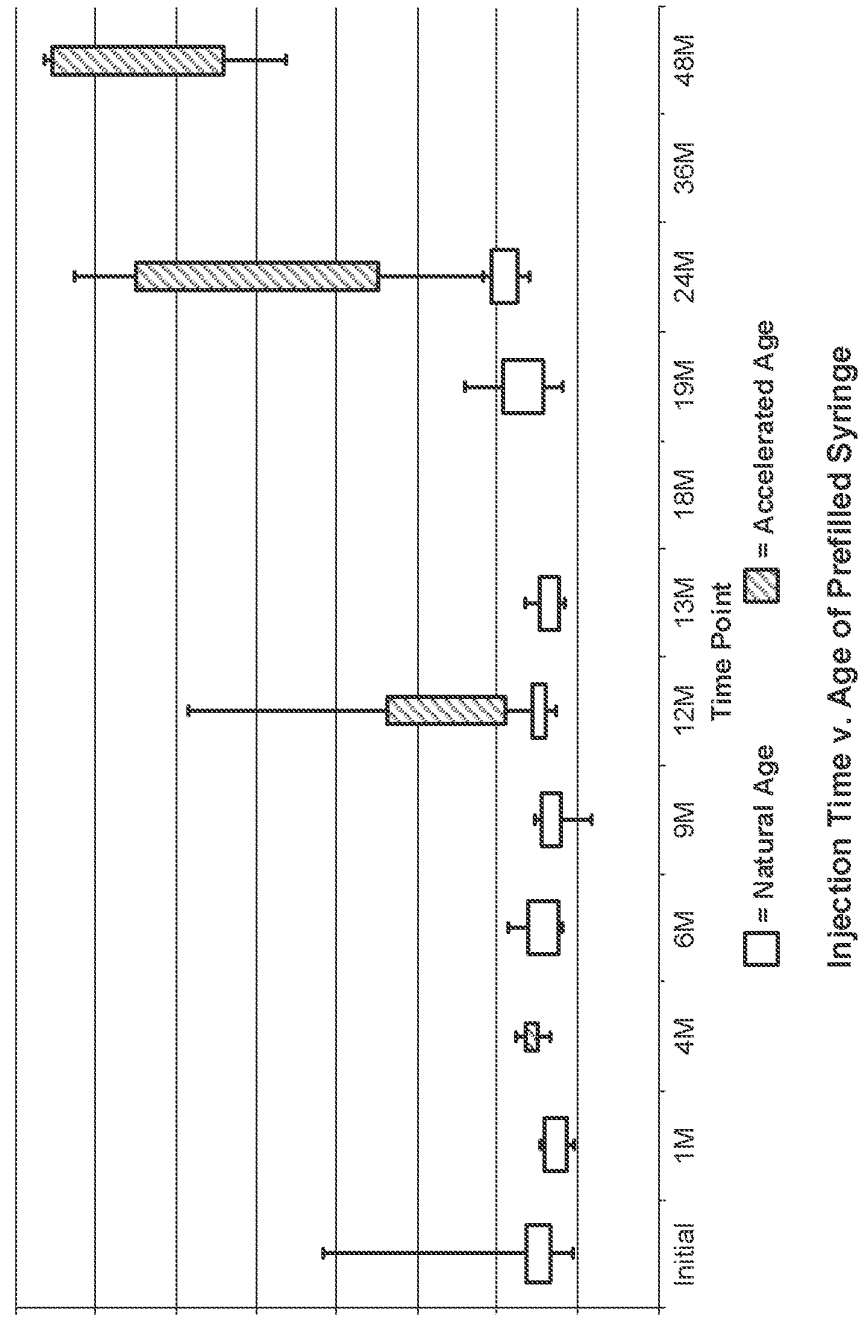

50.00000
45.00000
40.00000
35.00000
30.00000
25.00000
20.00000
15.00000
10.00000
Injection Time(s)
Initial
1M
4M
6M
9M
12M
13M
18M
19M
24M
36M
48M
Time Point
= Natural Age
= Accelerated Age
Injection Time v. Age of Prefilled Syringe

FIG. 4A

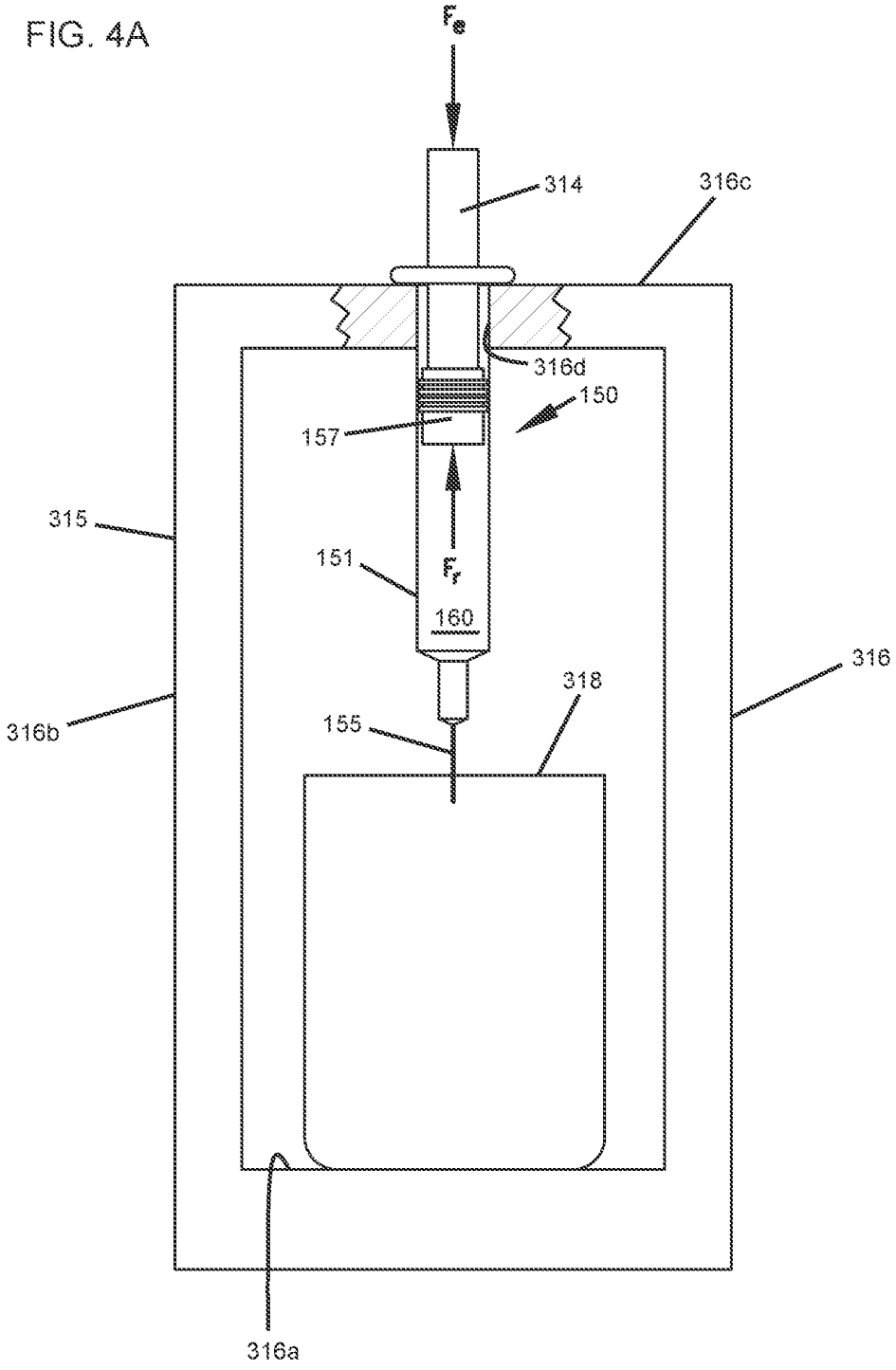


FIG. 4B

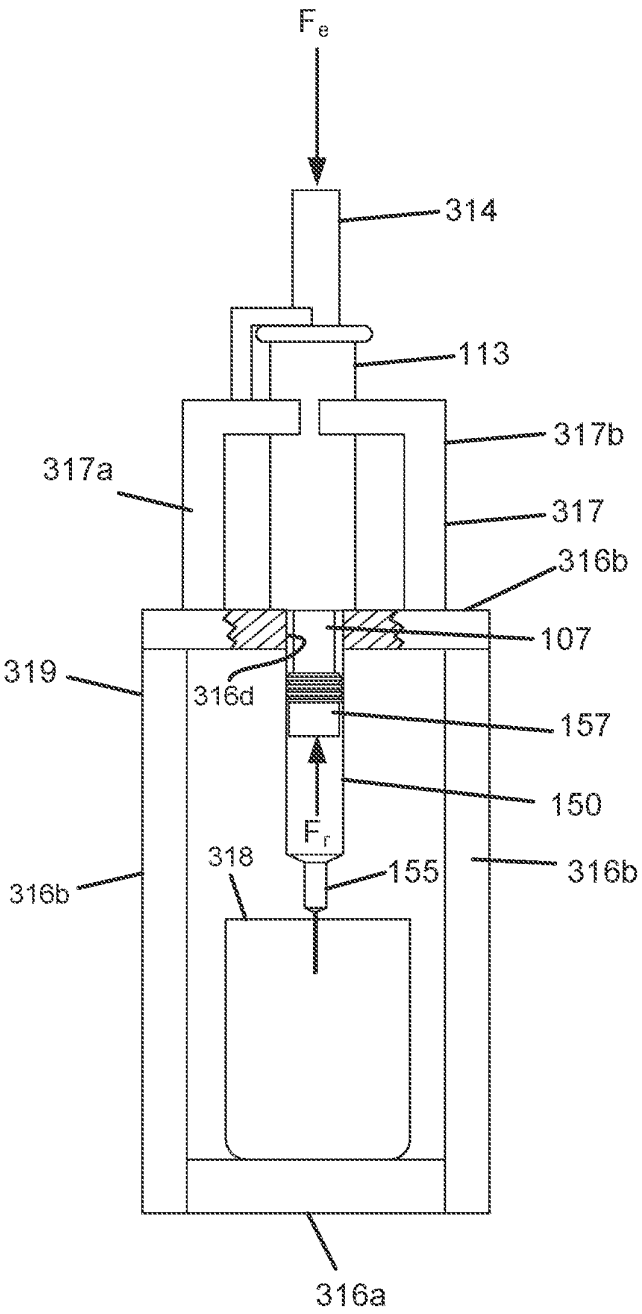

F_e
314
113
317b
317a
317
316b
107
319
316d
157
150
F_r
318
155
316b
316b
316a

FIG. 4C

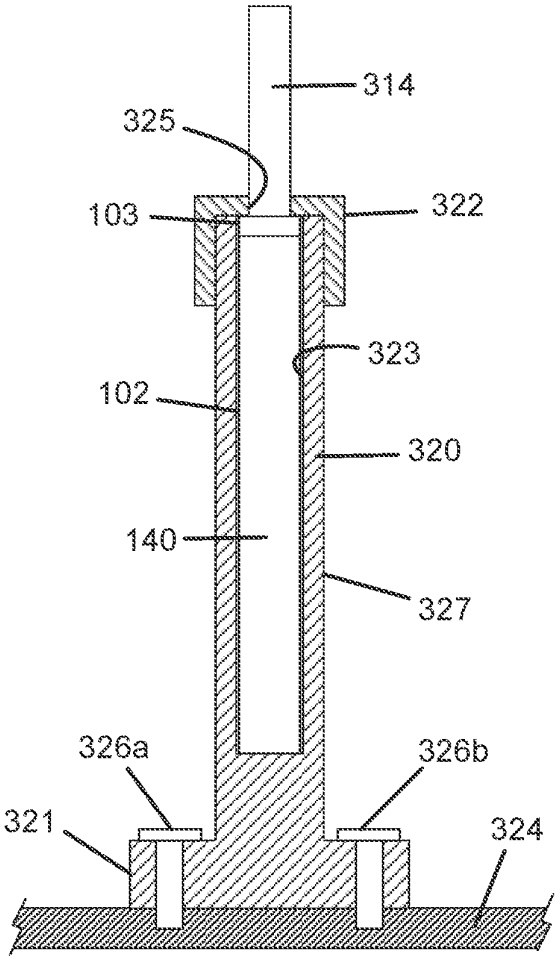


FIG. 5

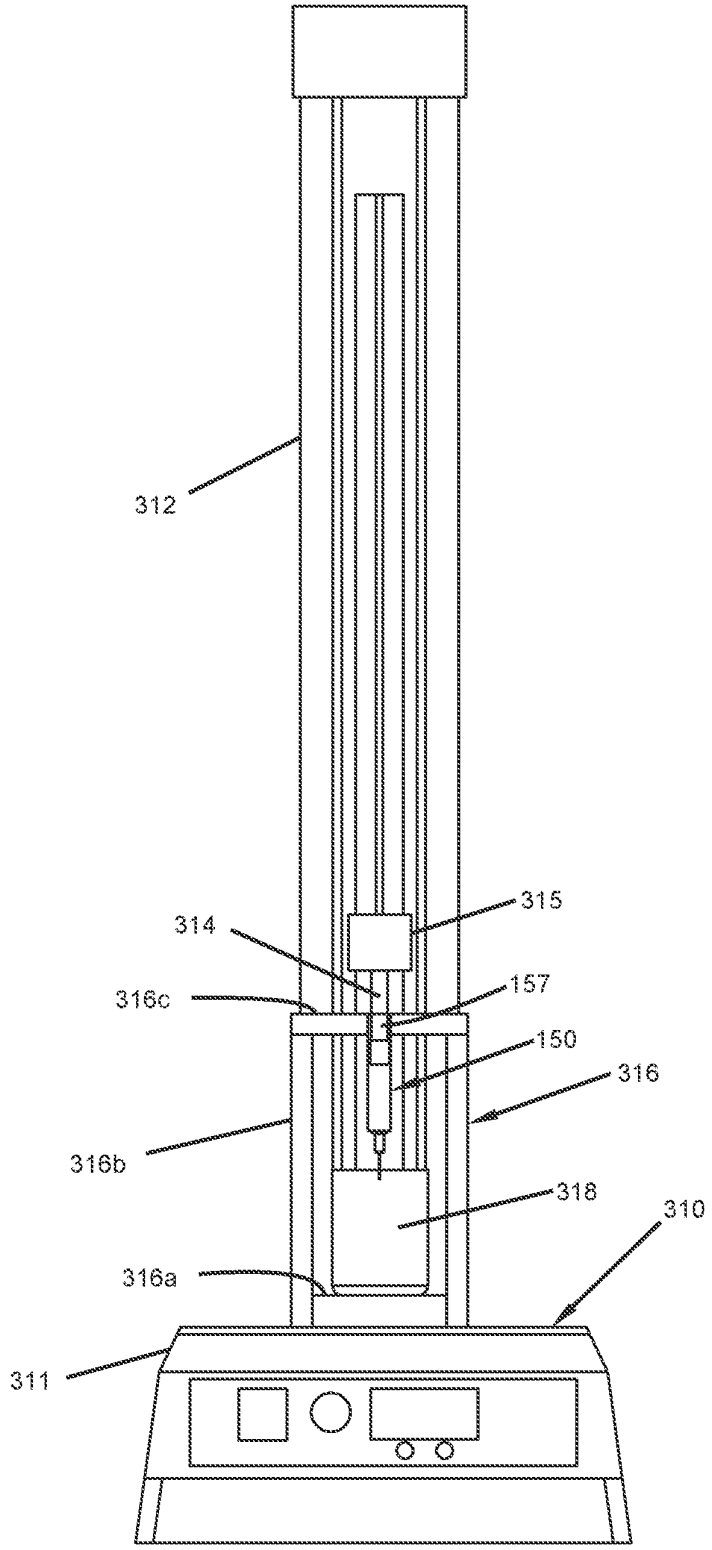
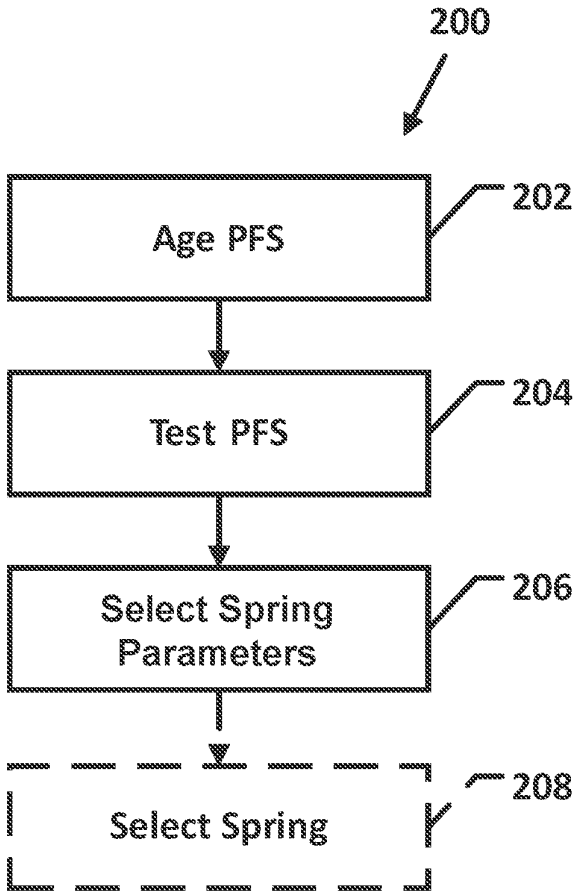


FIG. 6


200
Age PFS
202
Test PFS
204
Select Spring Parameters
206
Select Spring
208

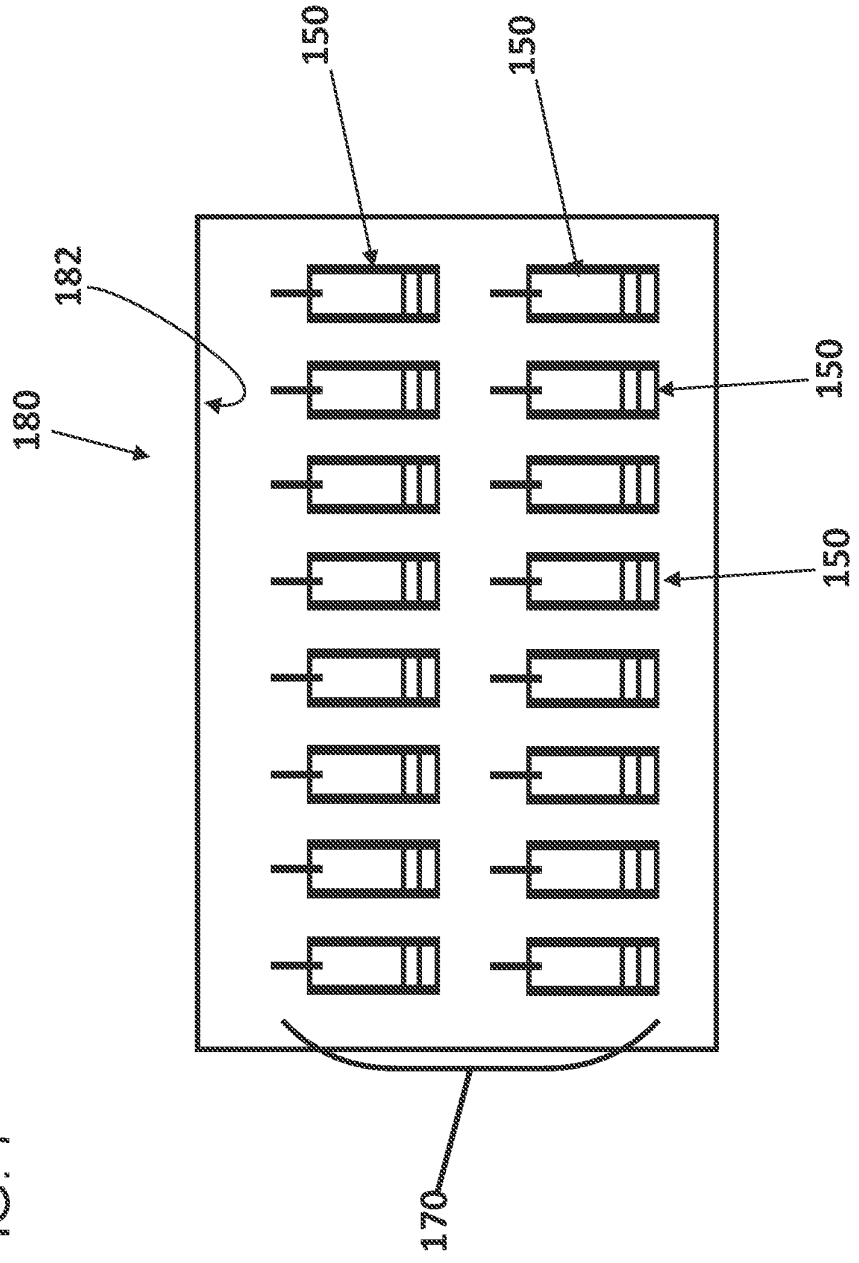


FIG. 7

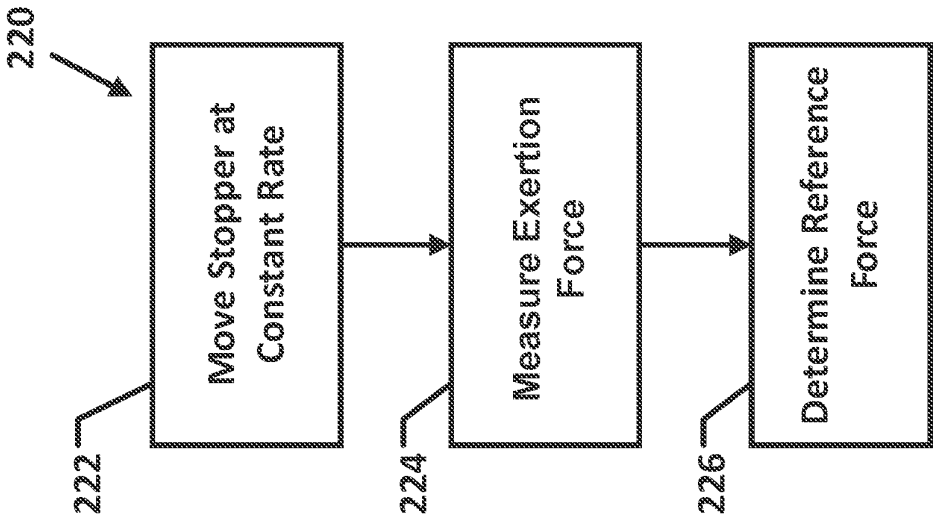

220
Move Stopper at Constant Rate
222
Measure Exertion Force
224
Determine Reference Force
226

FIG. 8

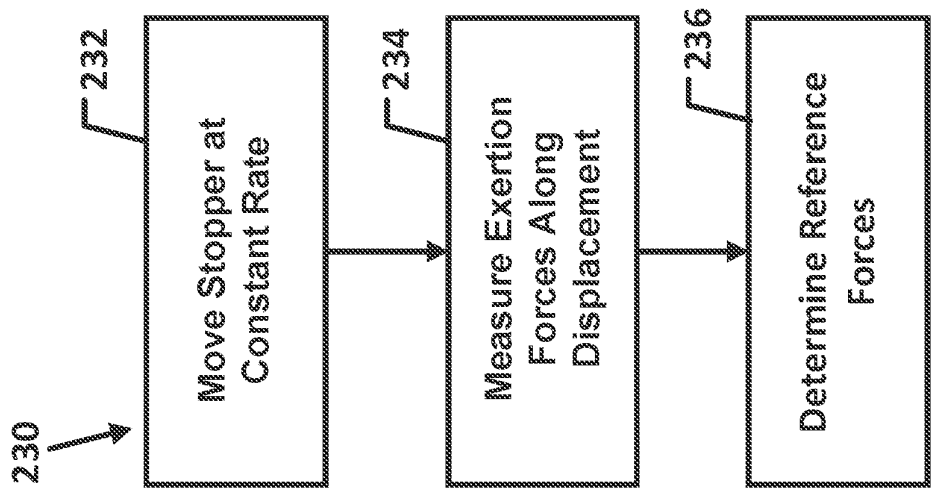

230
Move Stopper at Constant Rate
232
Measure Exertion Forces Along Displacement
234
Determine Reference Forces
236

FIG. 9

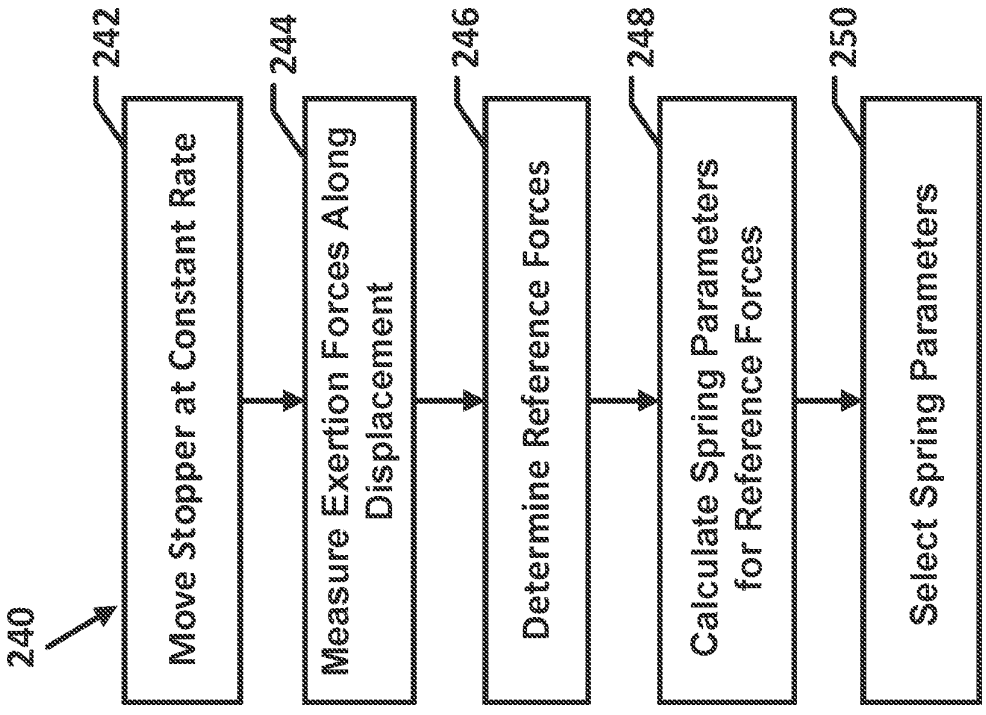

240
242
Move Stopper at Constant Rate
244
Measure Exertion Forces Along Displacement
246
Determine Reference Forces
248
Calculate Spring Parameters for Reference Forces
250
Select Spring Parameters

FIG. 10

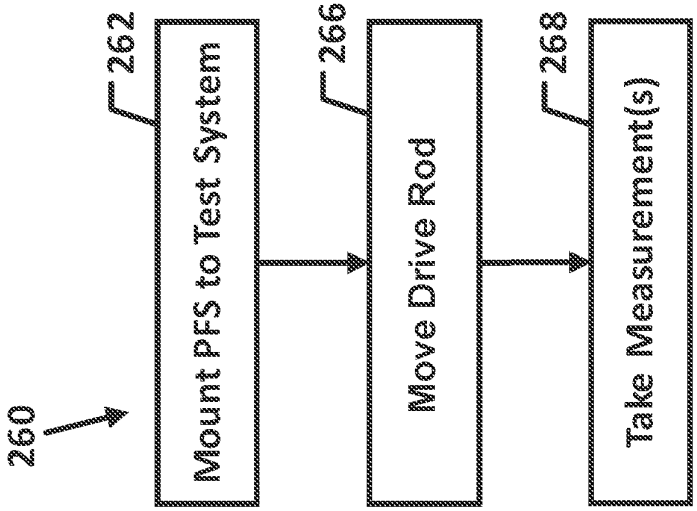

260
262
Mount PFS to Test System
266
Move Drive Rod
268
Take Measurement(s)

FIG. 11

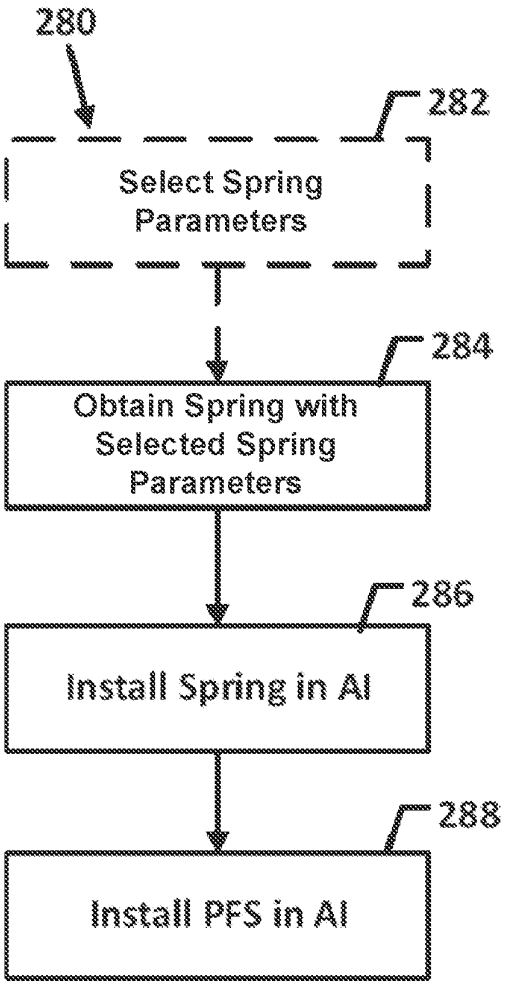

280
282
Select Spring Parameters
284
Obtain Spring with Selected Spring Parameters
286
Install Spring in AI
288
Install PFS in AI

FIG. 12

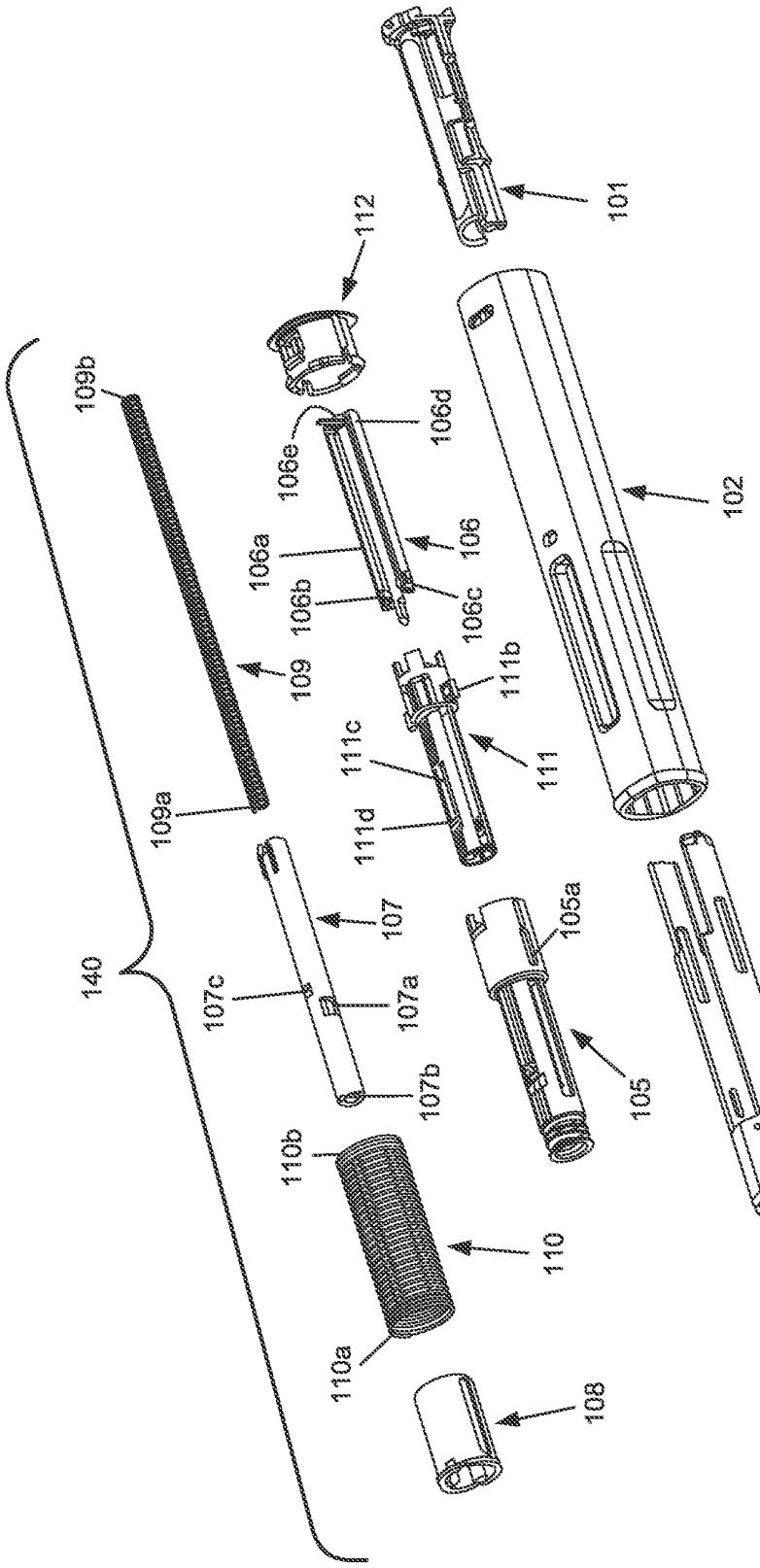

140
109b
109a
109
112
101
106e
106d
106a
106b
106c
106
102
111b
111c
111d
111
107
107c
107a
107b
105a
105
103
110b
110a
110
108
104

FIG. 13

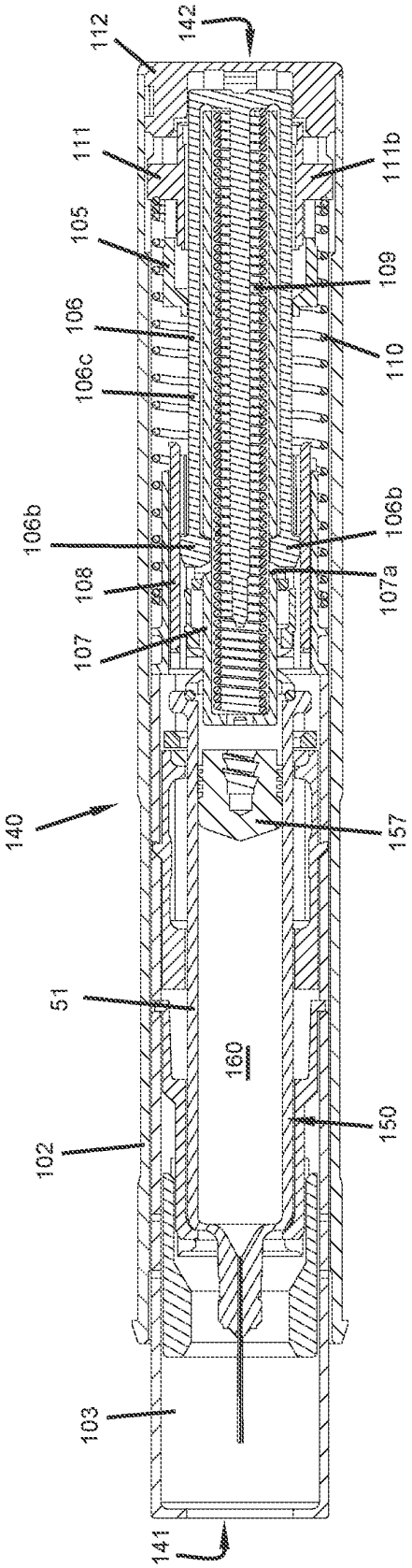

112
142
111
111b
105
109
106
110
106c
106b
106b
108
107a
107
140
157
51
160
150
102
103
141

FIG. 14

FIG. 15

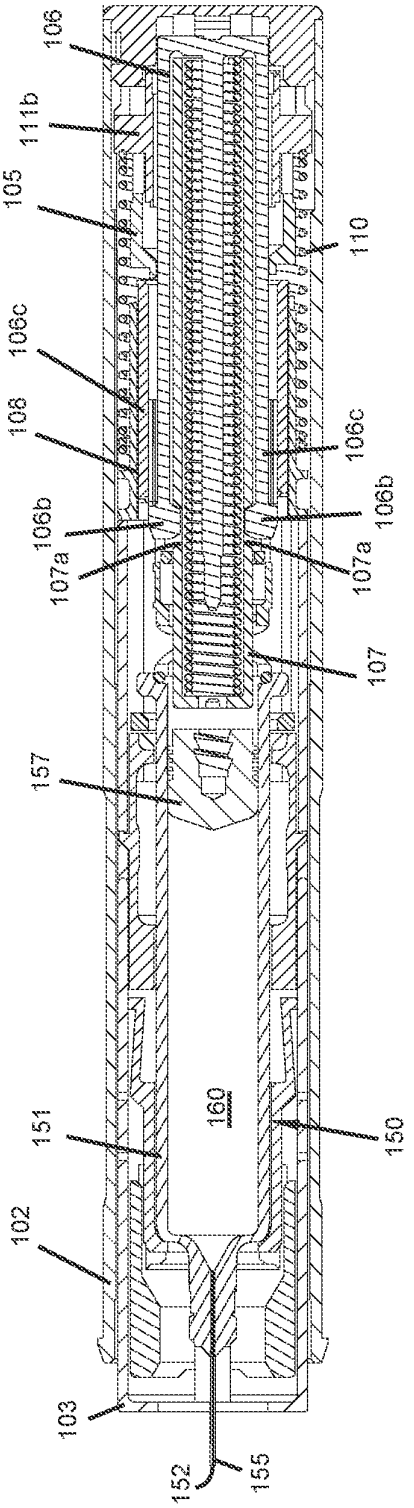

106
111b
105
110
106c
108
106c
106b
106b
107a
107a
107
157
160
151
150
102
103
152
155

FIG. 16

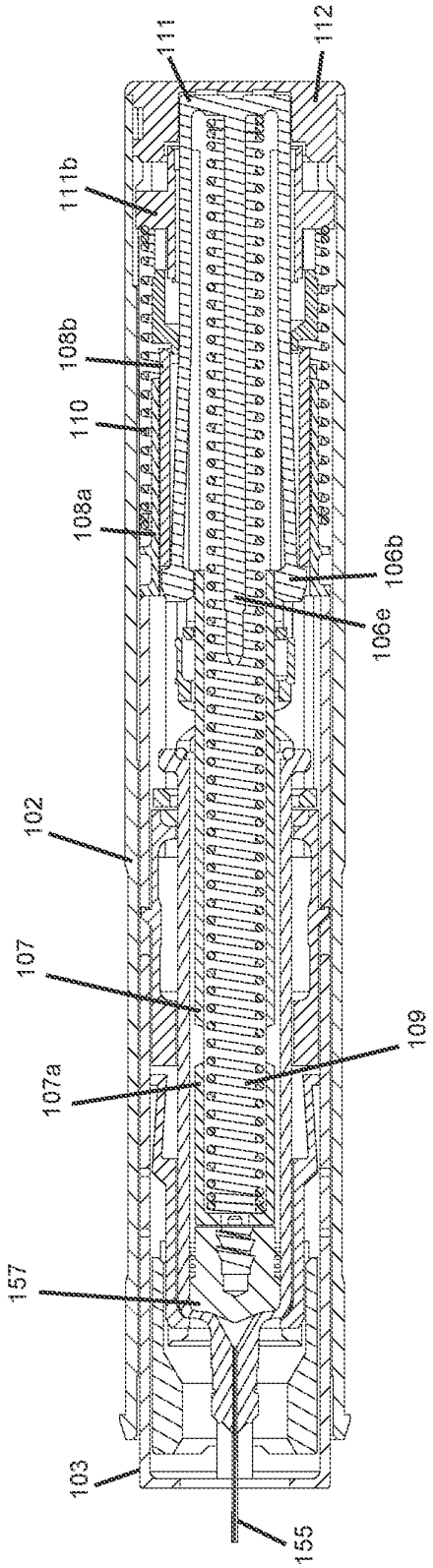
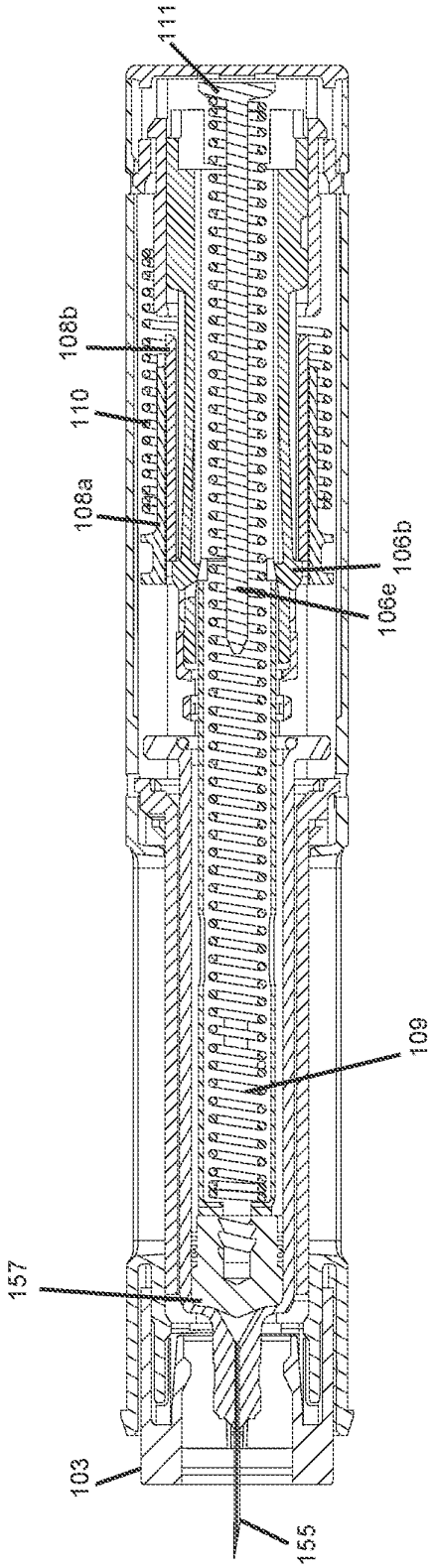

111
112
111b
108b
110
108a
106b
106e
102
107
109
107a
157
103
155

FIG. 17



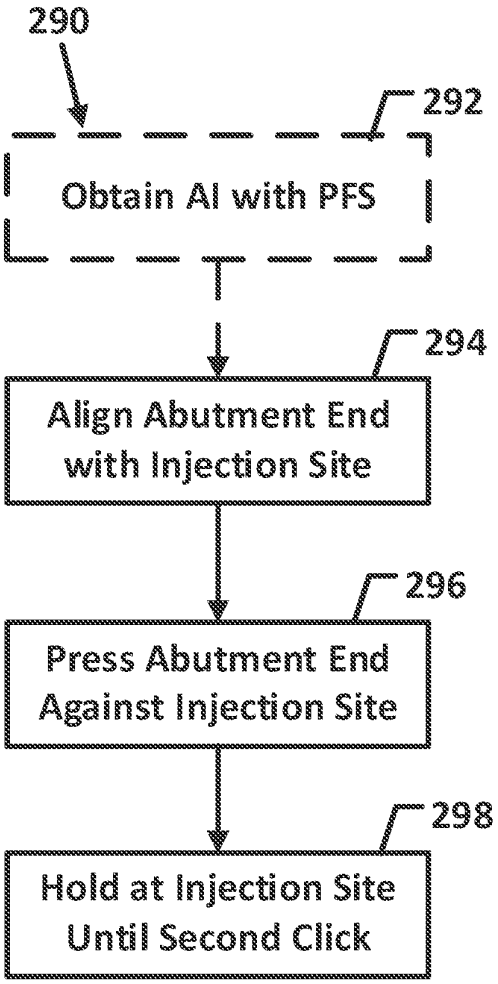

290
292
Obtain AI with PFS
294
Align Abutment End with Injection Site
296
Press Abutment End Against Injection Site
298
Hold at Injection Site Until Second Click

FIG. 18

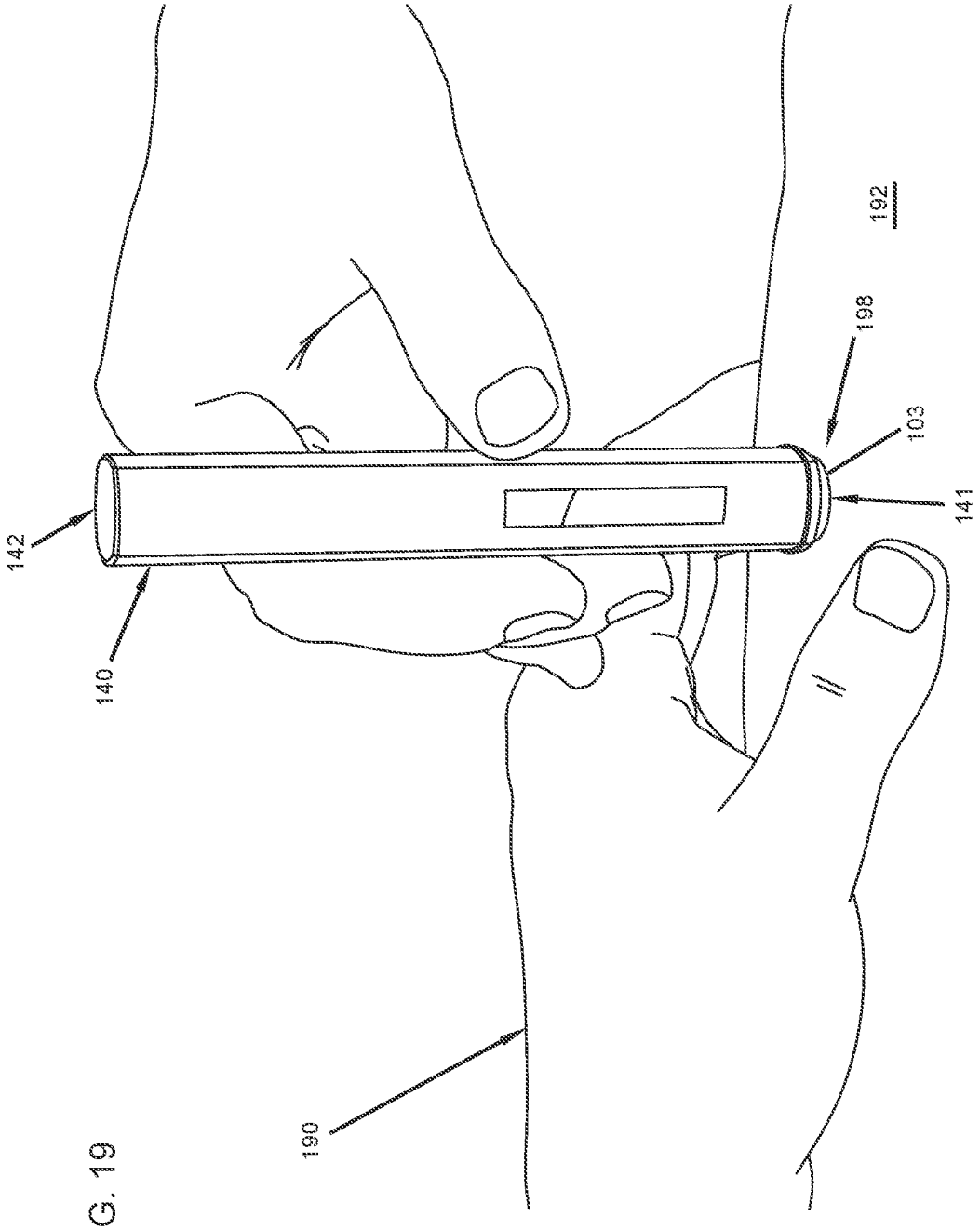


FIG. 19