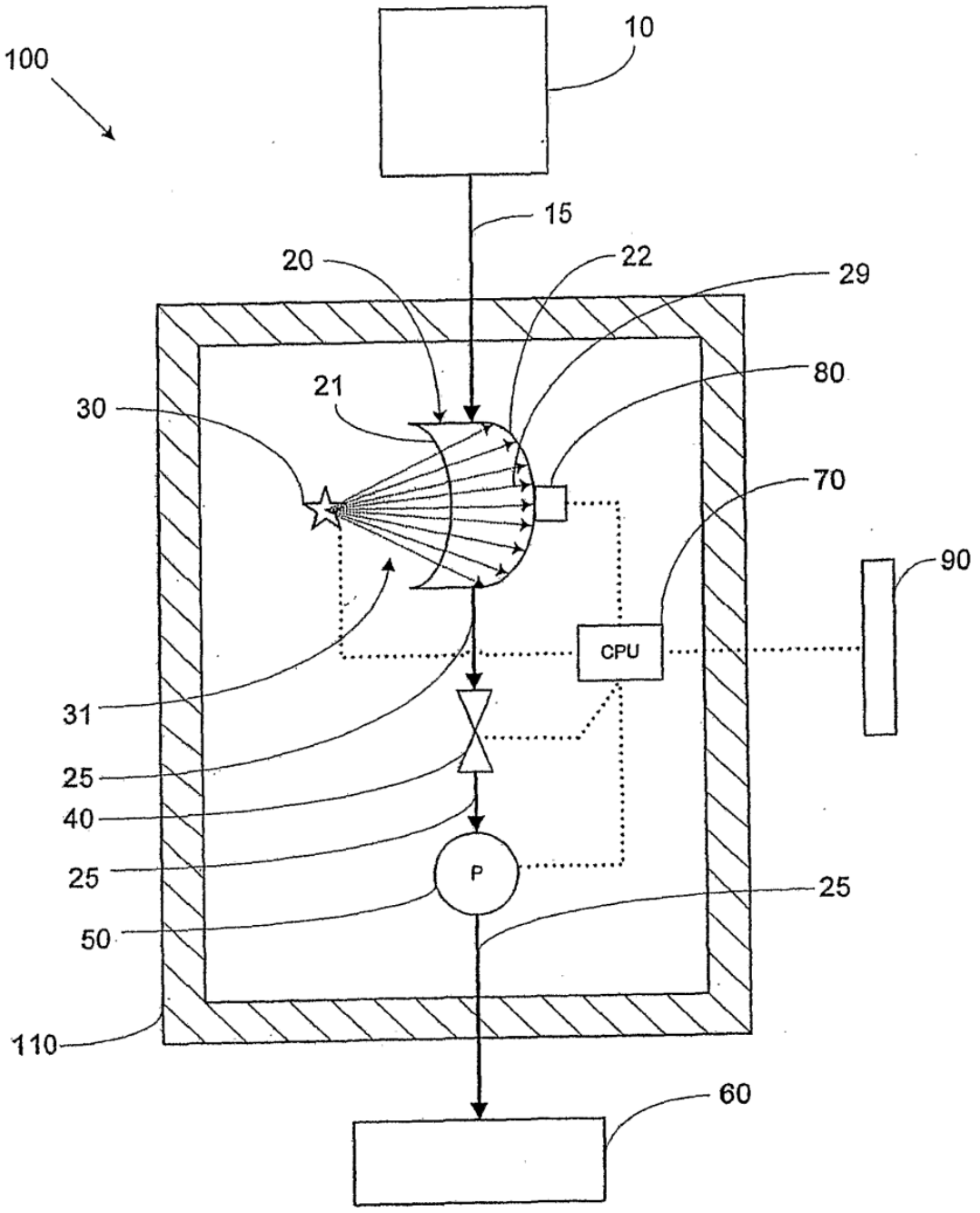


FIGURE 1

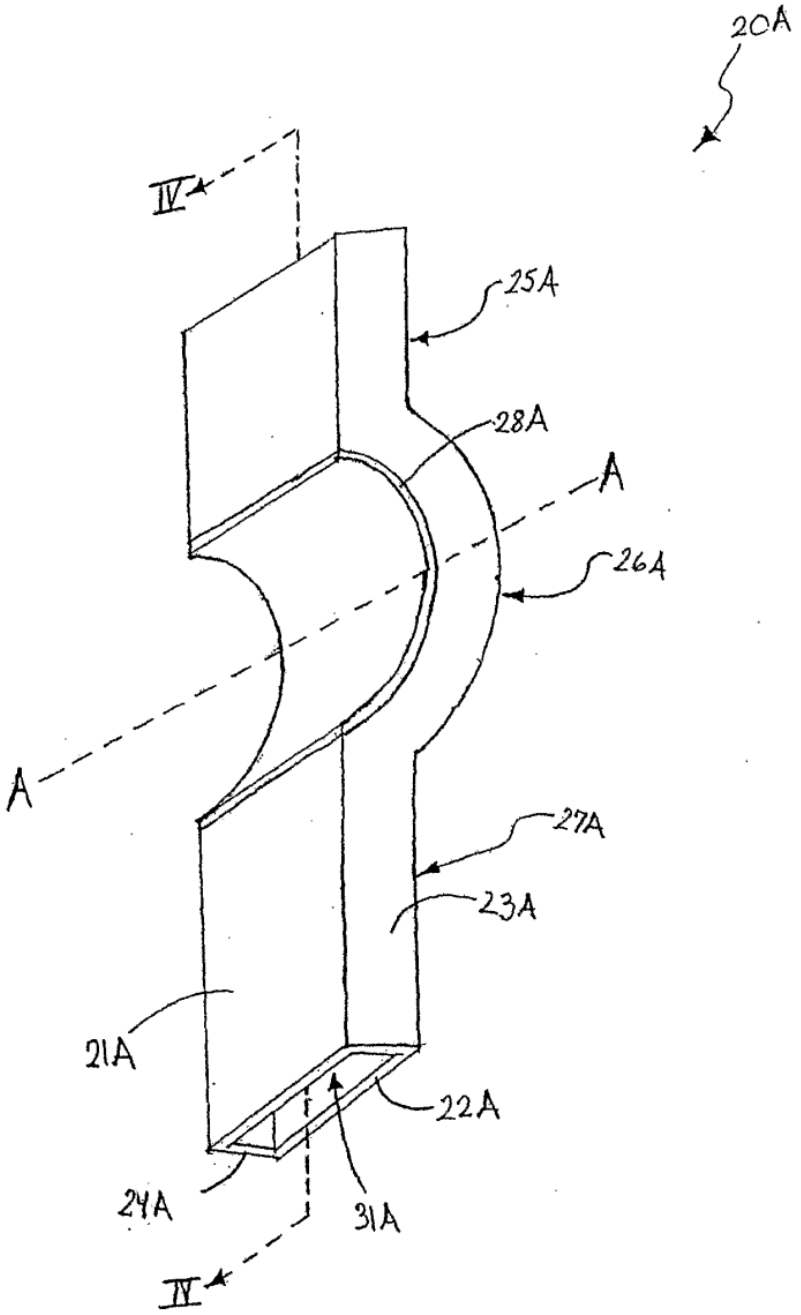


Figure 2

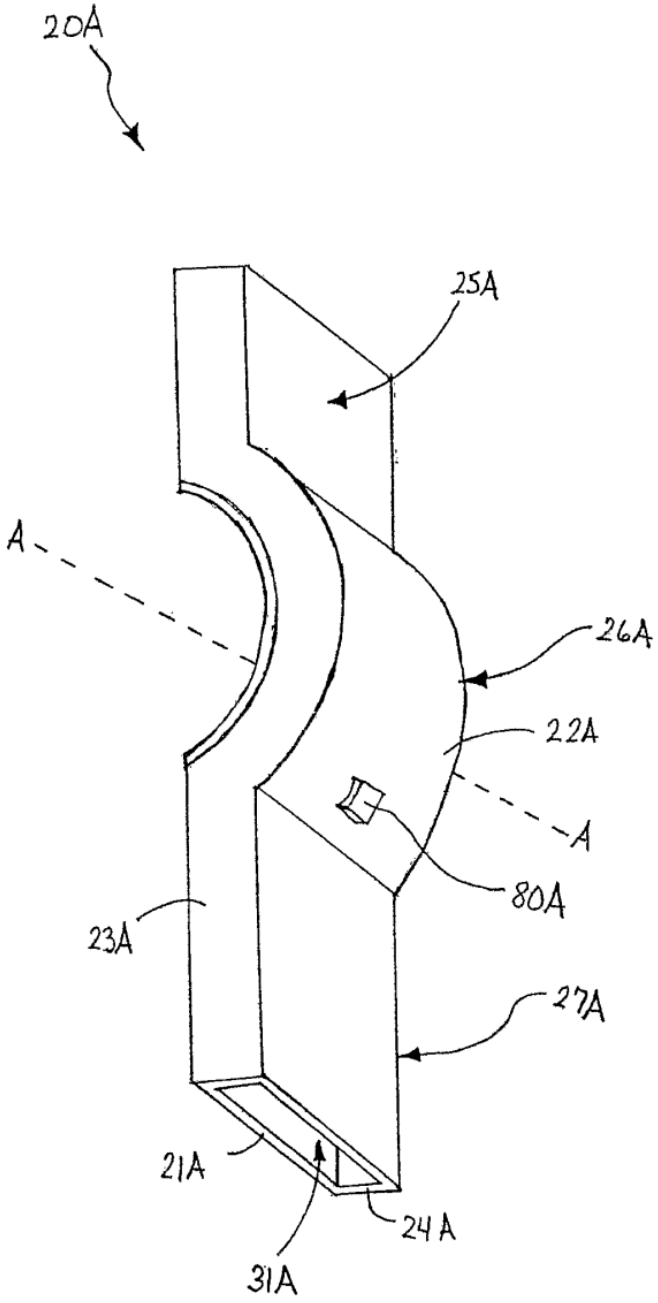


Figure 3

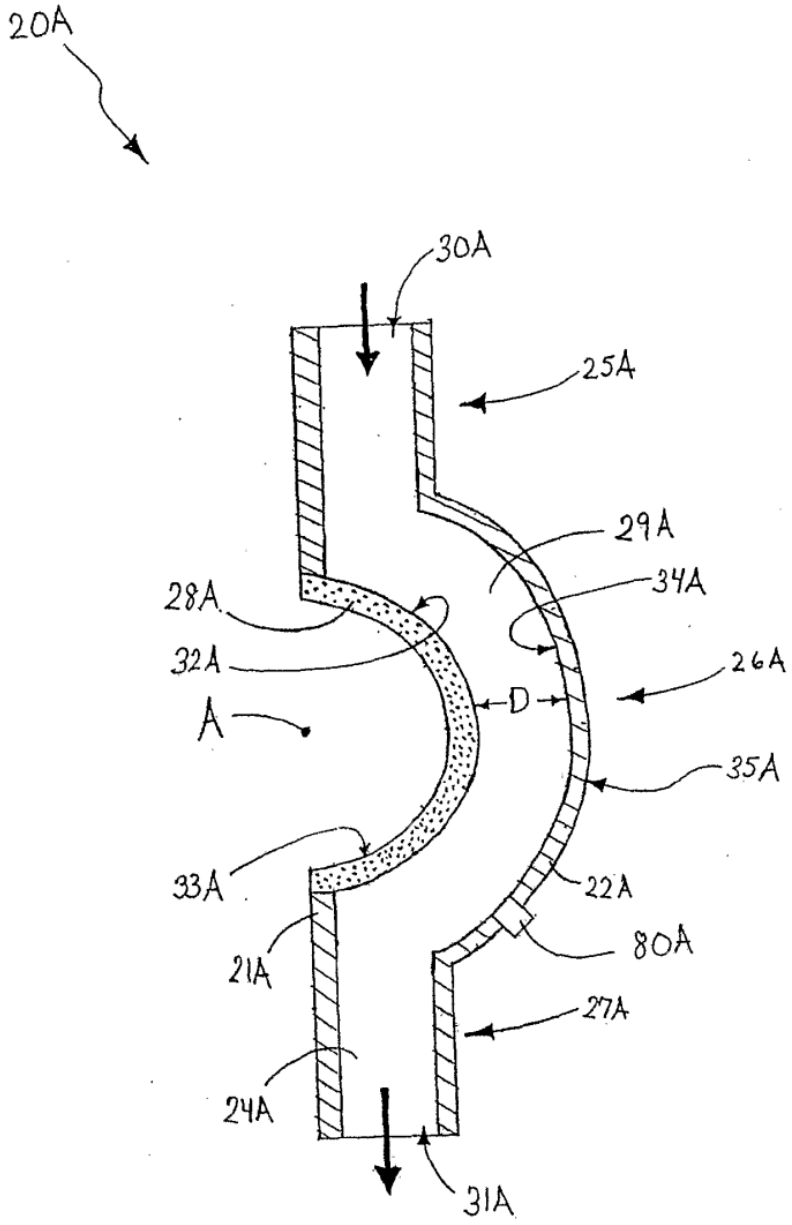

20A
30A
25A
29A
34A
28A
32A
26A
D
A
35A
33A
22A
80A
21A
27A
24A
31A

Figure 4

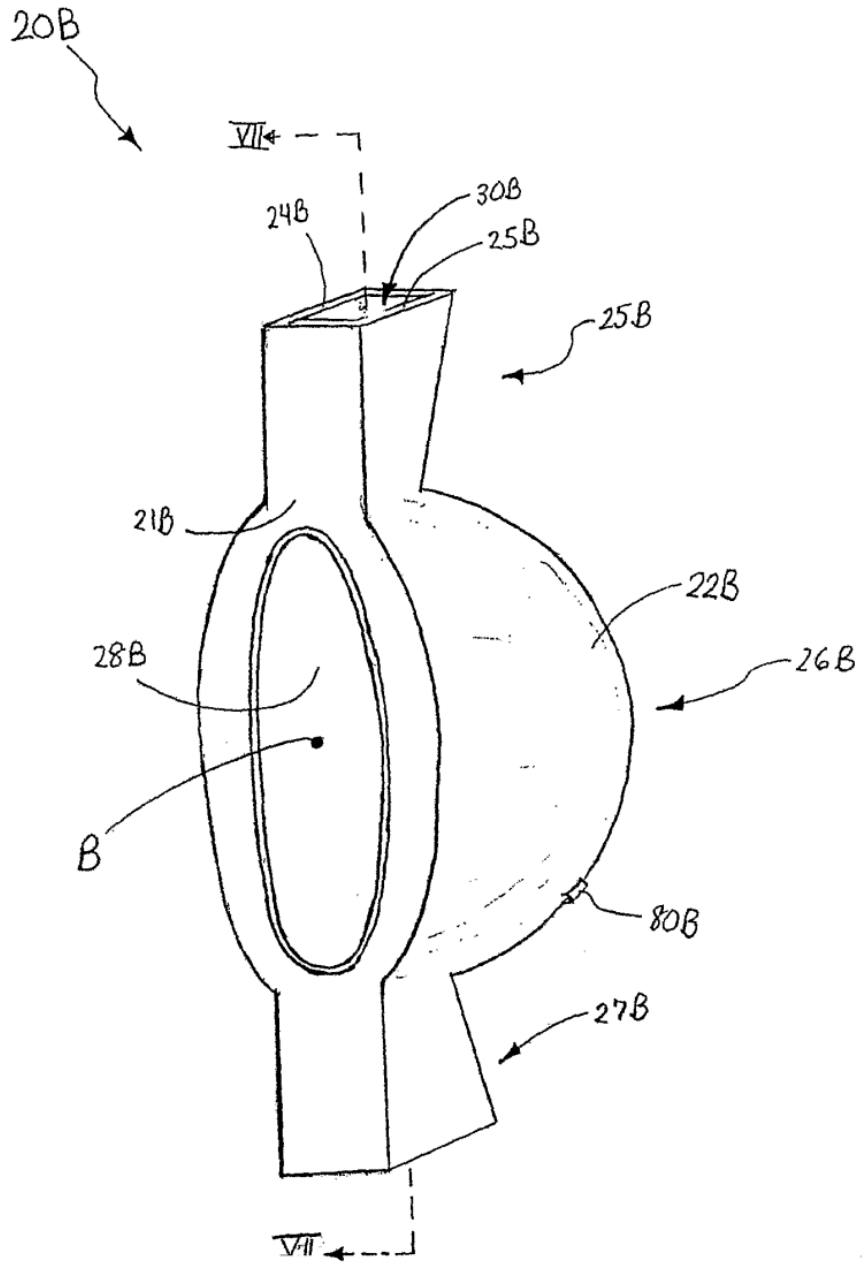


Figure 5

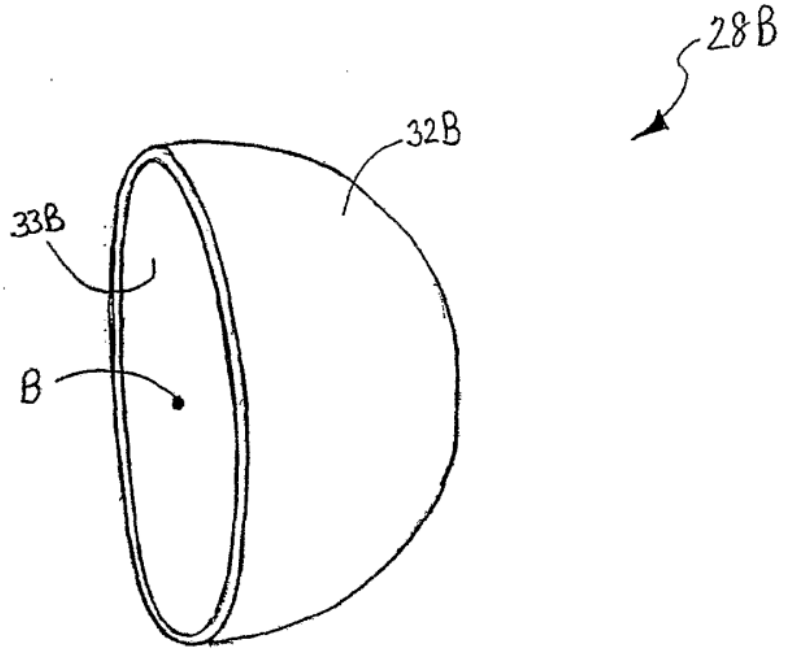


Figure 6

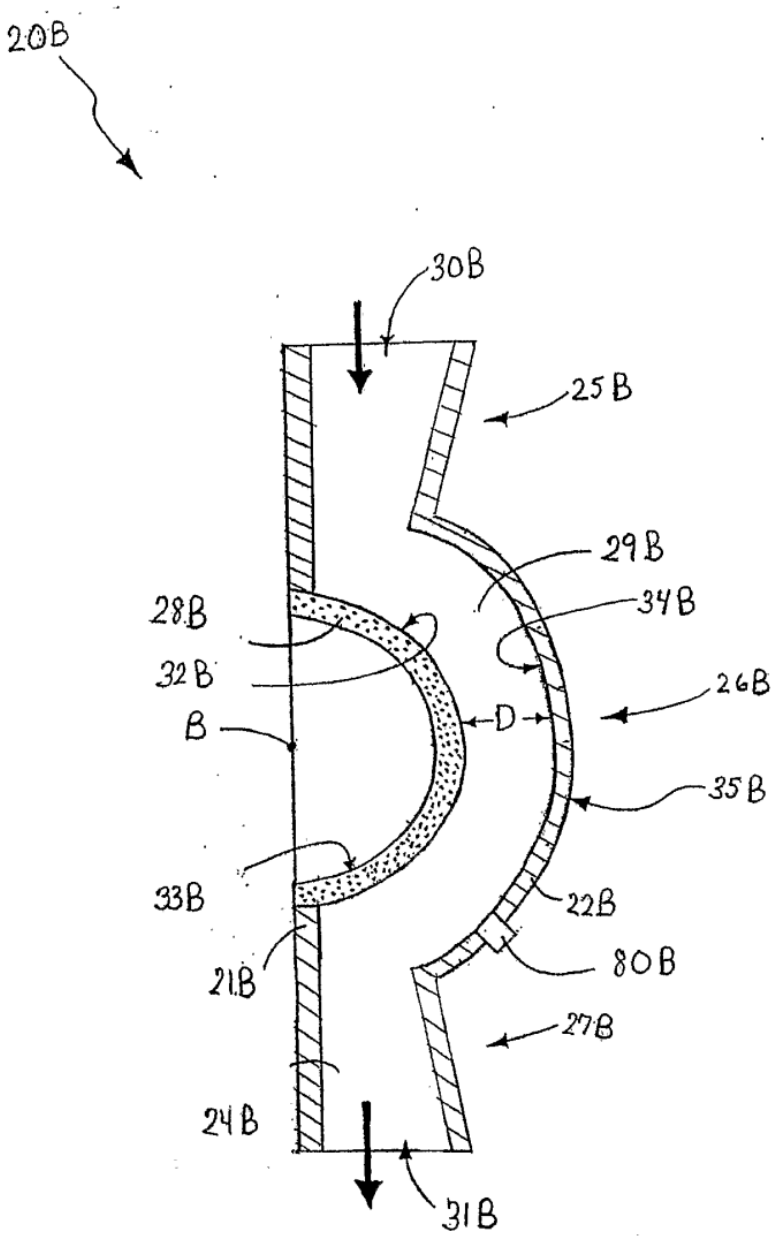

20B
30B
25B
29B
34B
28B
32B
26B
B
D
35B
33B
22B
80B
21B
27B
24B
31B

Figure 7

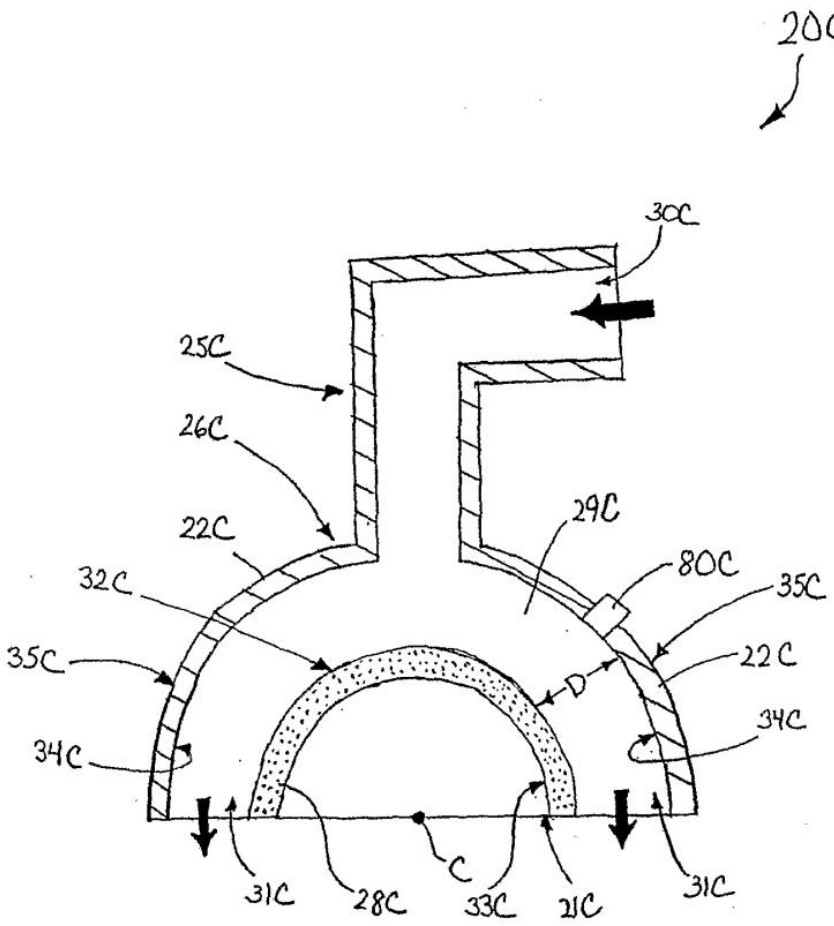

20C
30C
25C
26C
22C
29C
80C
35C
32C
35C
22C
D
34C
34C
31C
28C
C
33C
21C
31C

Figure 8

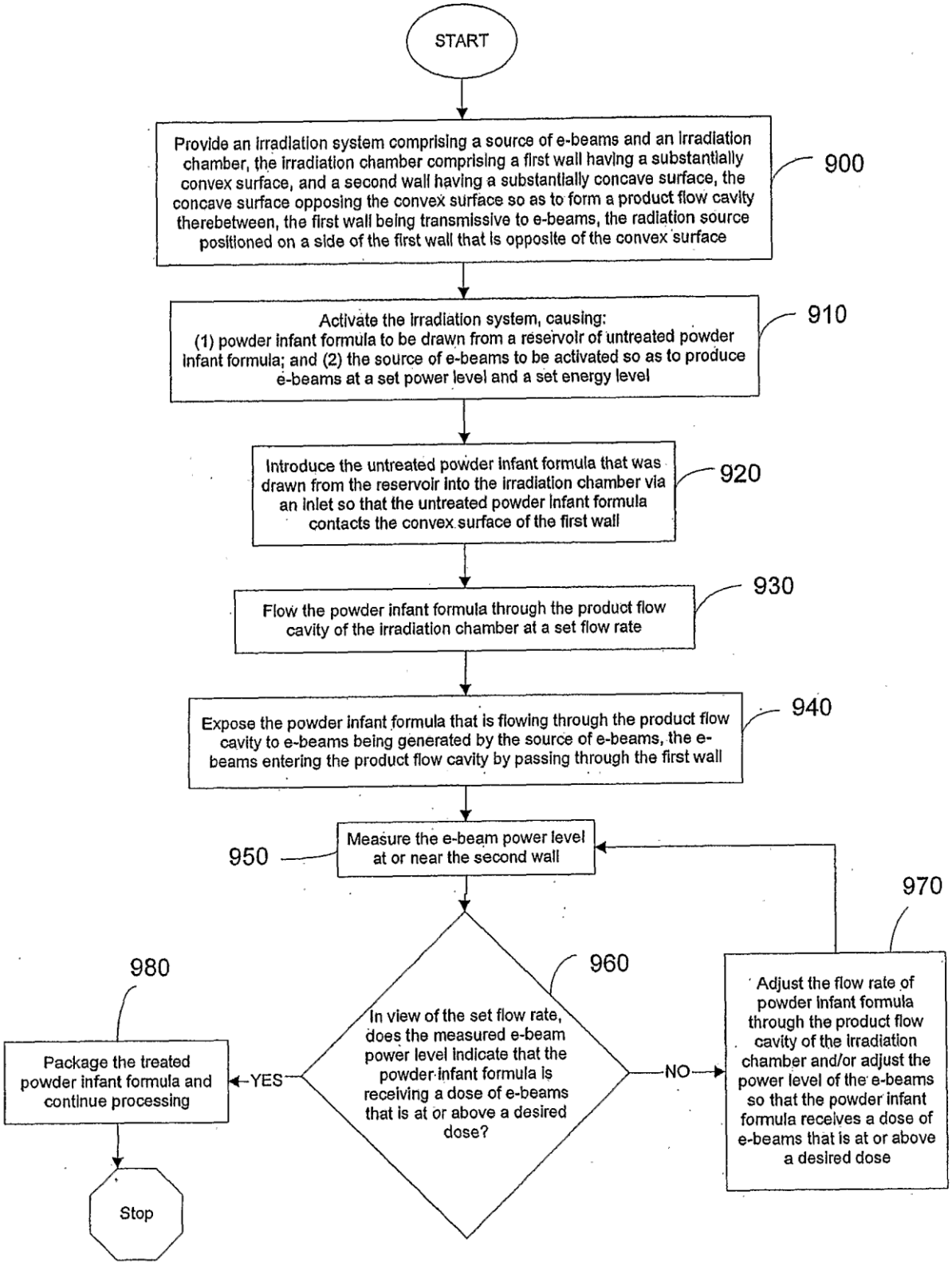
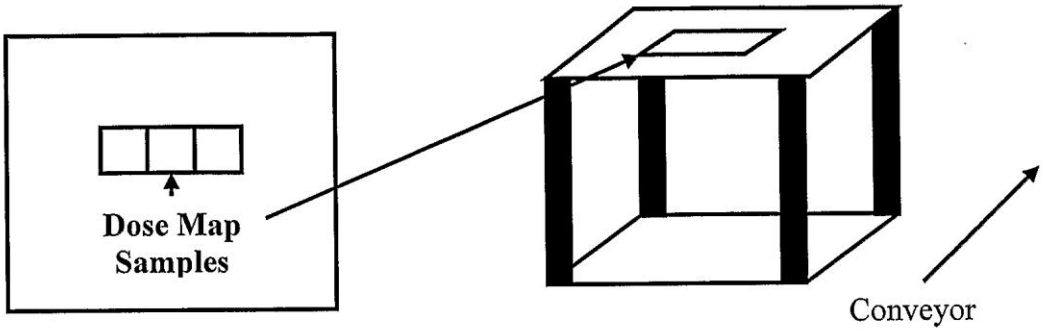

START
Provide an irradiation system comprising a source of e-beams and an irradiation chamber, the irradiation chamber comprising a first wall having a substantially convex surface, and a second wall having a substantially concave surface, the concave surface opposing the convex surface so as to form a product flow cavity therebetween, the first wall being transmissive to e-beams, the radiation source positioned on a side of the first wall that is opposite of the convex surface
900
Activate the irradiation system, causing: (1) powder infant formula to be drawn from a reservoir of untreated powder infant formula; and (2) the source of e-beams to be activated so as to produce e-beams at a set power level and a set energy level
910
Introduce the untreated powder infant formula that was drawn from the reservoir into the irradiation chamber via an inlet so that the untreated powder infant formula contacts the convex surface of the first wall
920
Flow the powder infant formula through the product flow cavity of the irradiation chamber at a set flow rate
930
Expose the powder infant formula that is flowing through the product flow cavity to e-beams being generated by the source of e-beams, the e-beams entering the product flow cavity by passing through the first wall
940
Measure the e-beam power level at or near the second wall
950
In view of the set flow rate, does the measured e-beam power level indicate that the powder infant formula is receiving a dose of e-beams that is at or above a desired dose?
960
YES
NO
Package the treated powder infant formula and continue processing
980
Stop
Adjust the flow rate of powder infant formula through the product flow cavity of the irradiation chamber and/or adjust the power level of the e-beams so that the powder infant formula receives a dose of e-beams that is at or above a desired dose
970

Figure 9



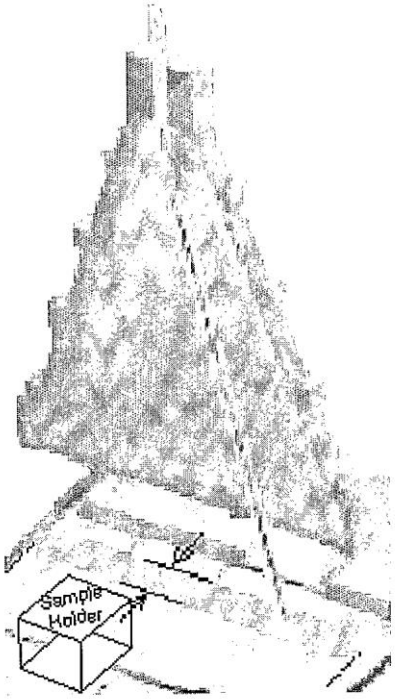


Figure 10

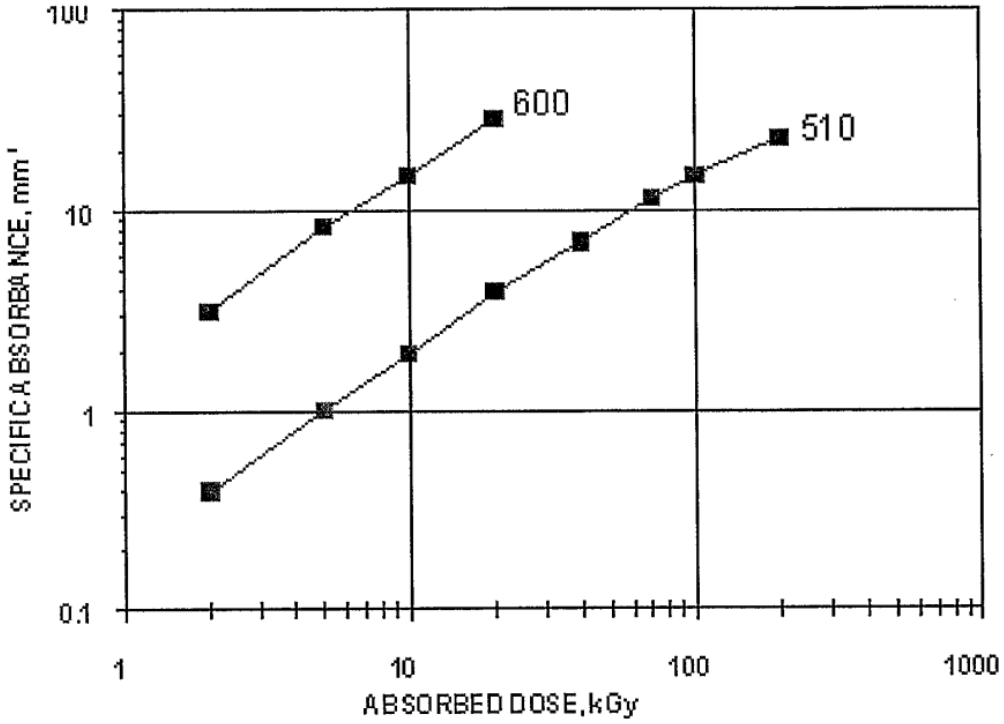

100
10
1
0.1
SPECIFIC ABSORBANCE, mm⁻¹
600
510
1
10
100
1000
ABSORBED DOSE, kGy

Figure 11

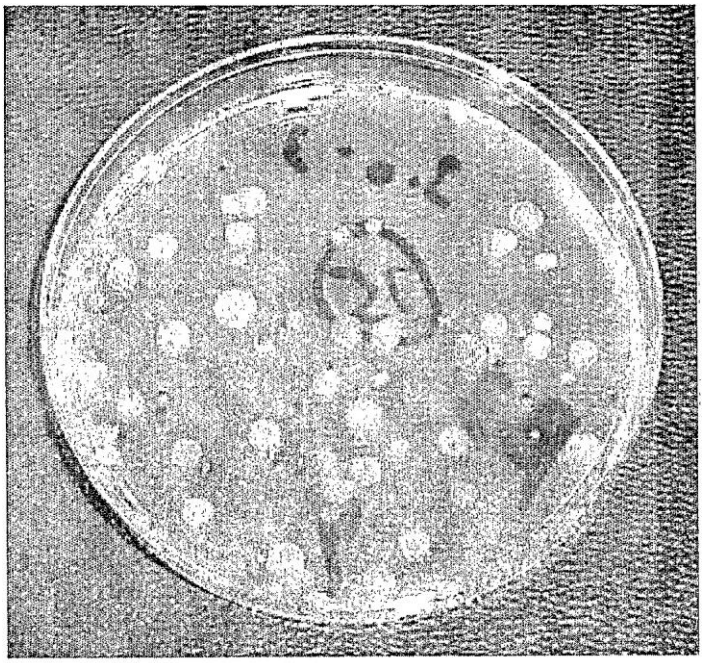


Figure 12

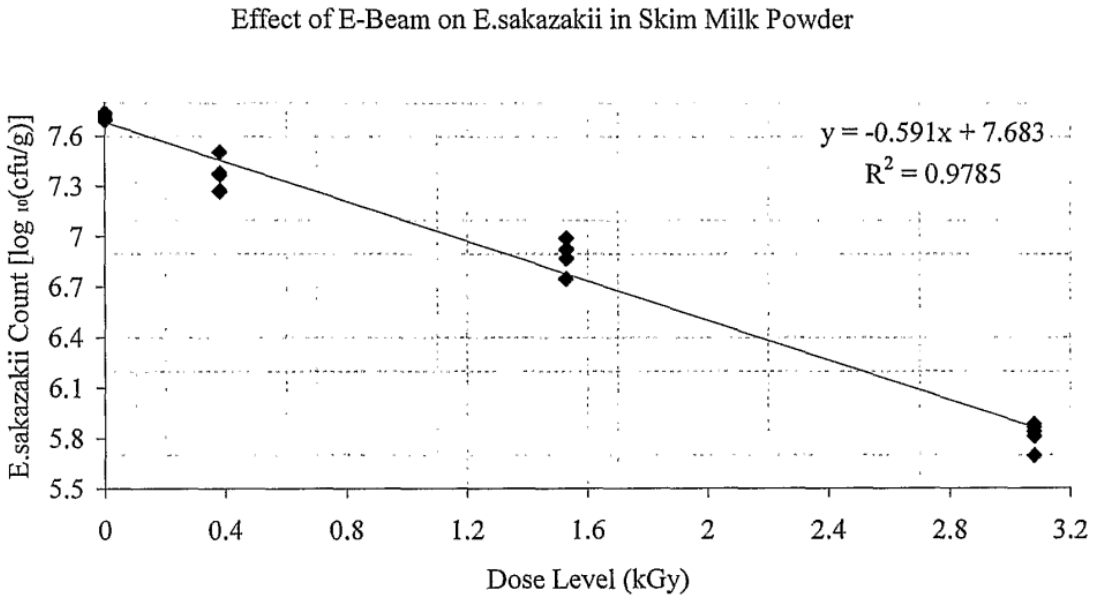

Effect of E-Beam on E.sakazakii in Skim Milk Powder
E.sakazakii Count [log 10(cfu/g)]
7.6
7.3
7
6.7
6.4
6.1
5.8
5.5
0
0.4
0.8
1.2
1.6
2
2.4
2.8
3.2
Dose Level (kGy)
y = -0.591x + 7.683
R2 = 0.9785

Figure 13