

DRAWINGS

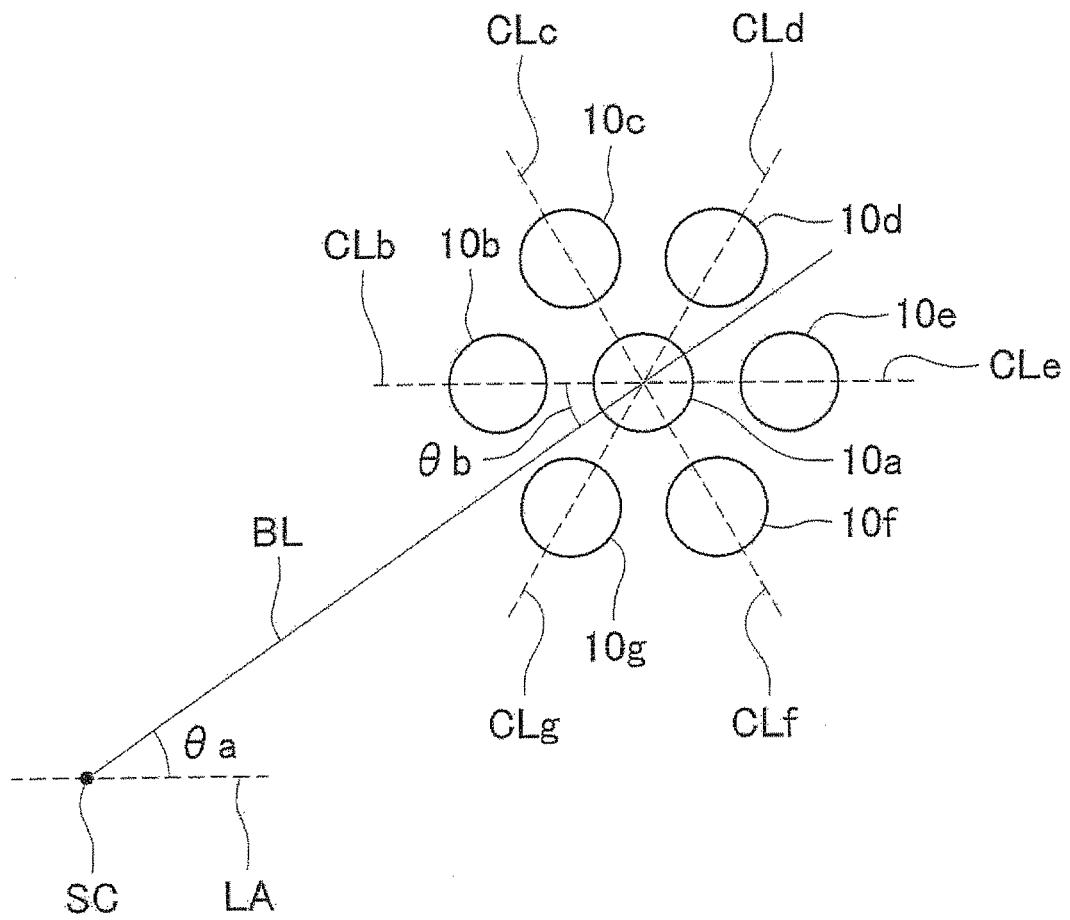


FIG. 1

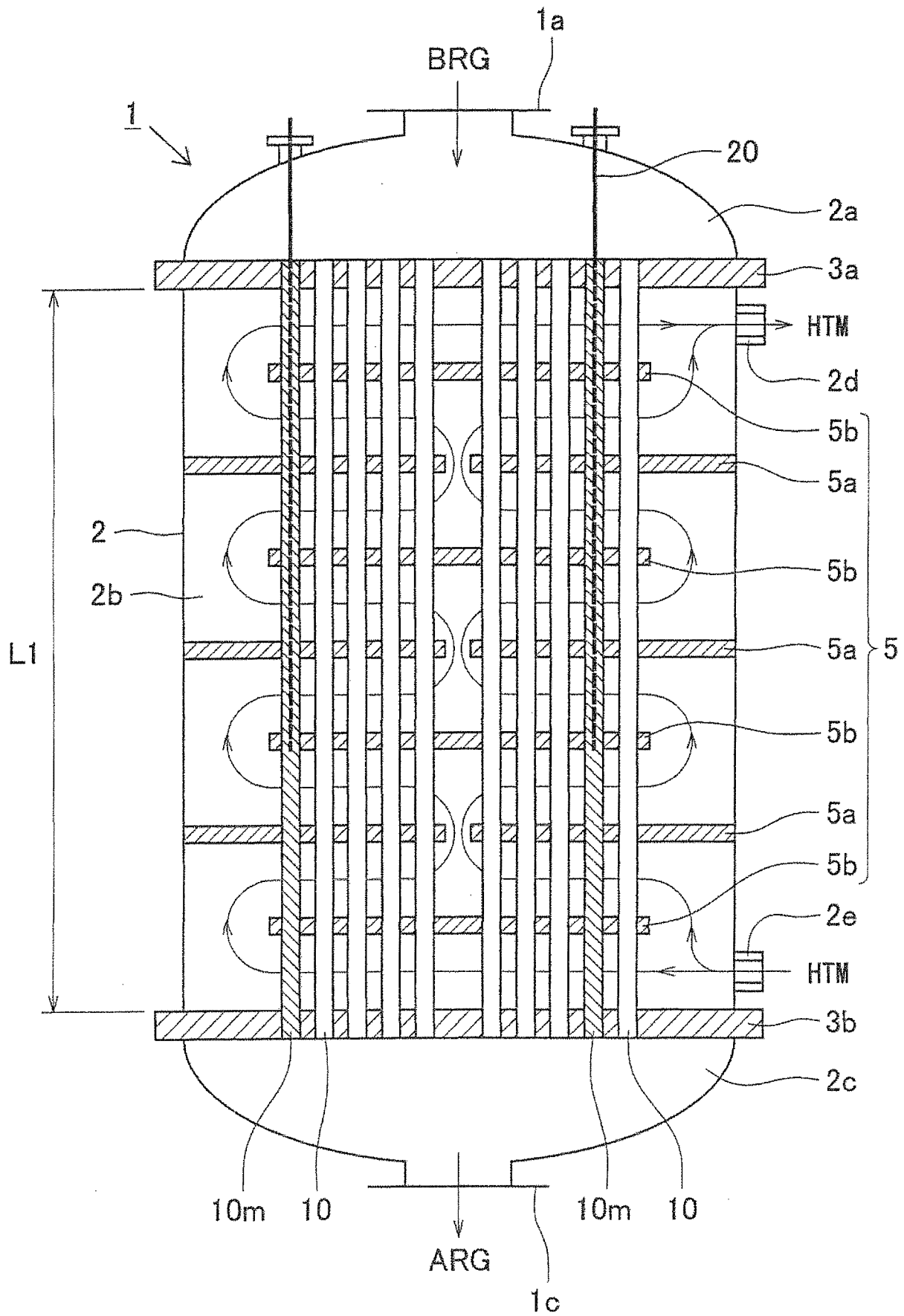


FIG. 2

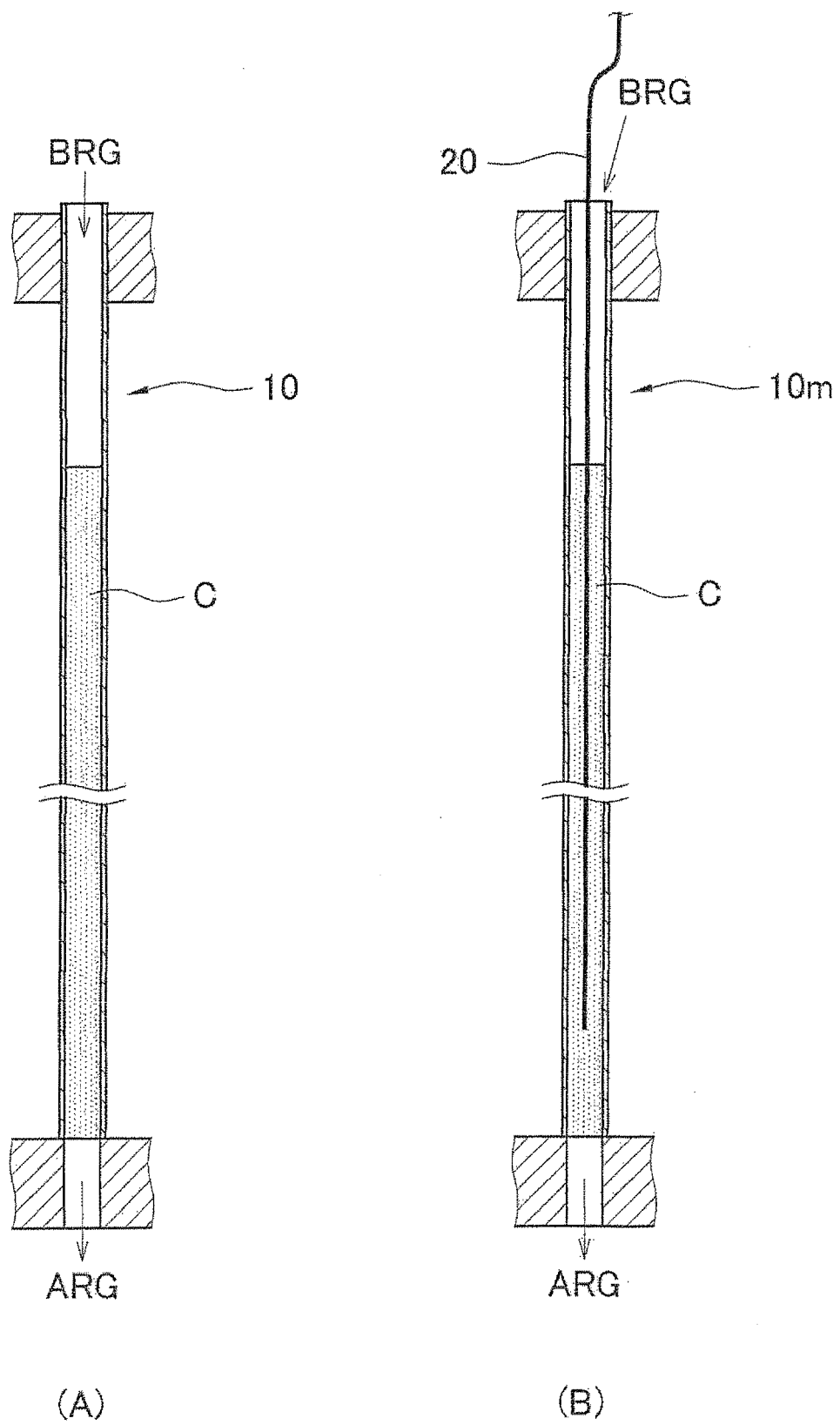


FIG. 3

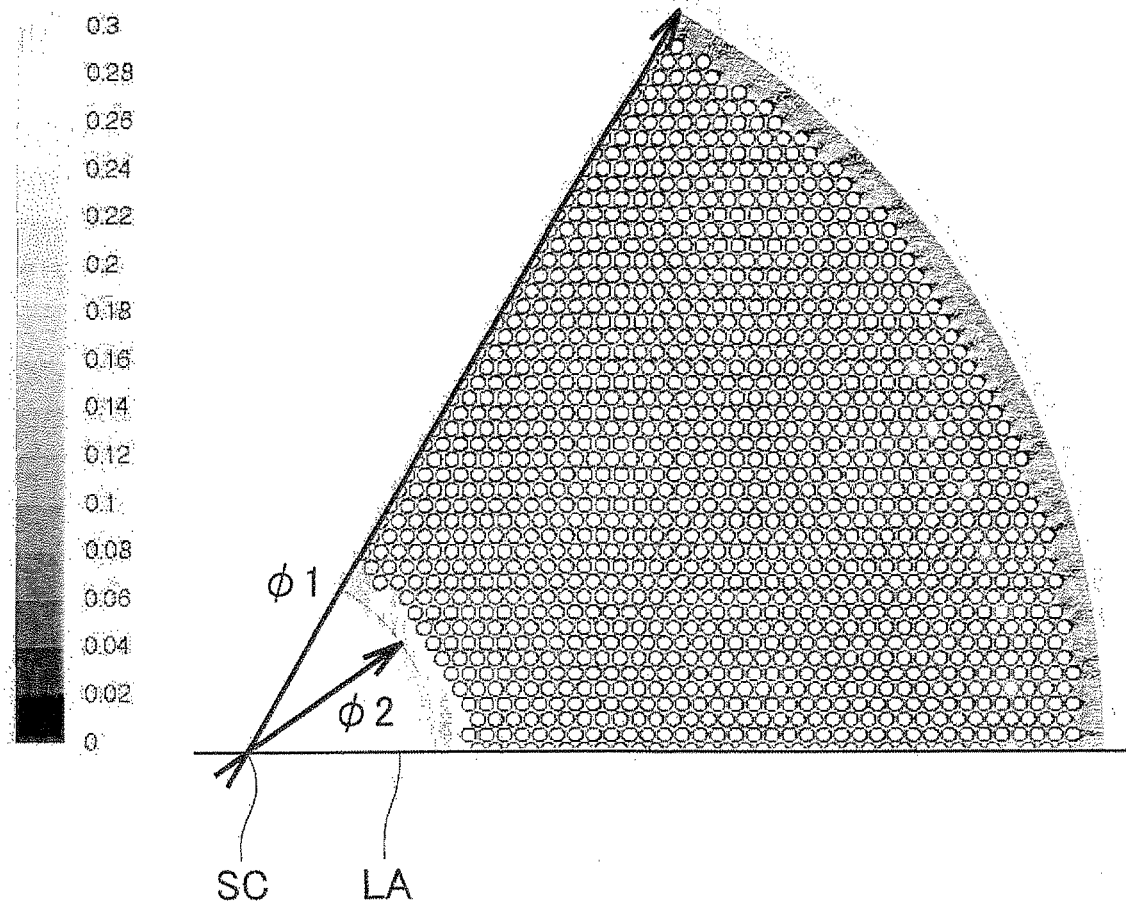
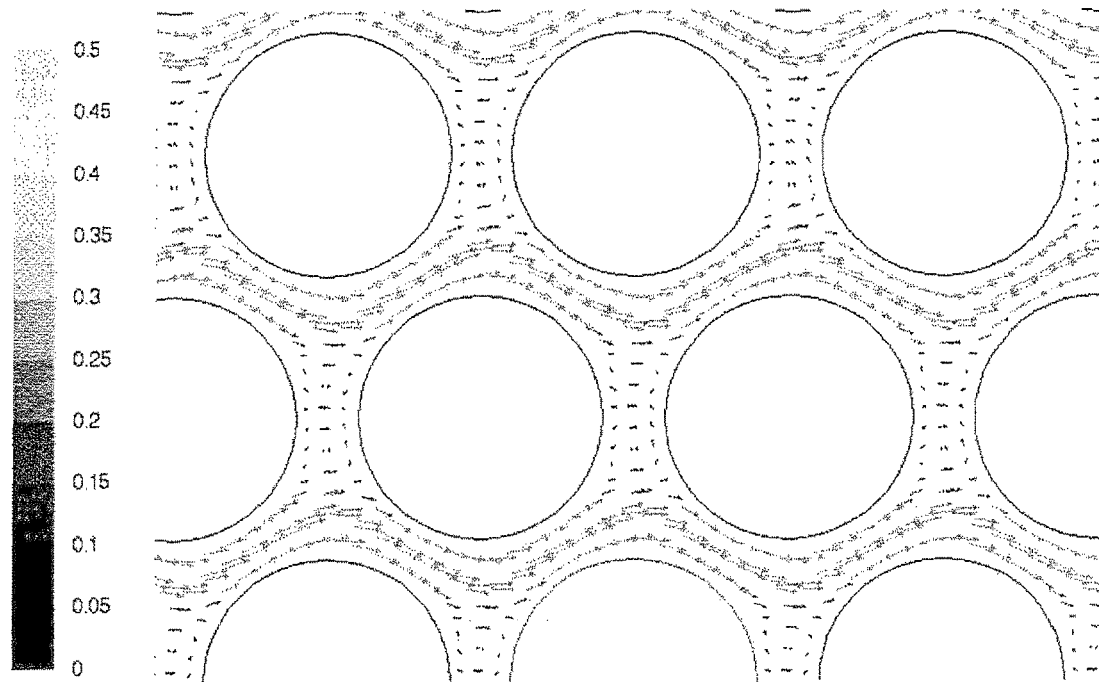


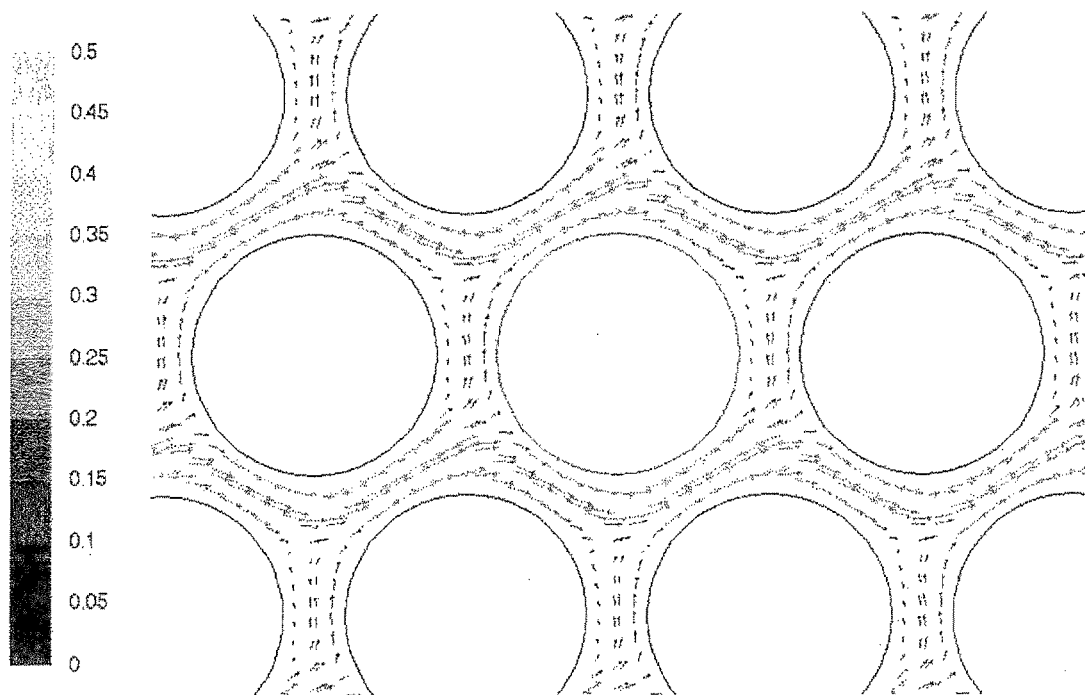
FIG. 4

Flow Condition at 0 degree



(A)

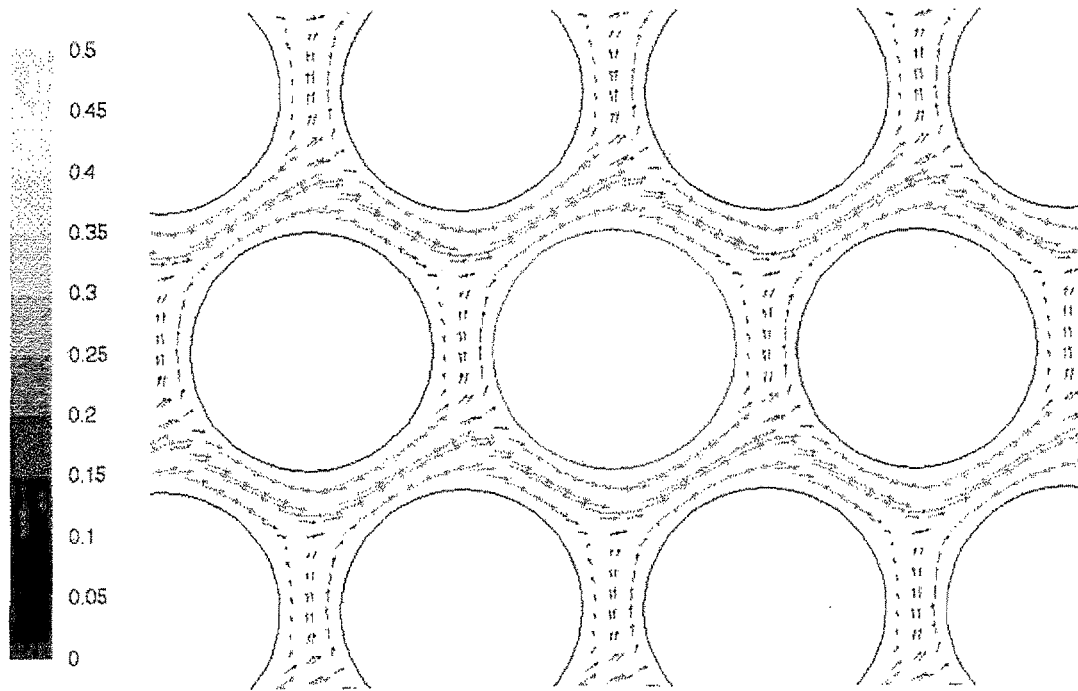
Flow Condition at 10 degree



(B)

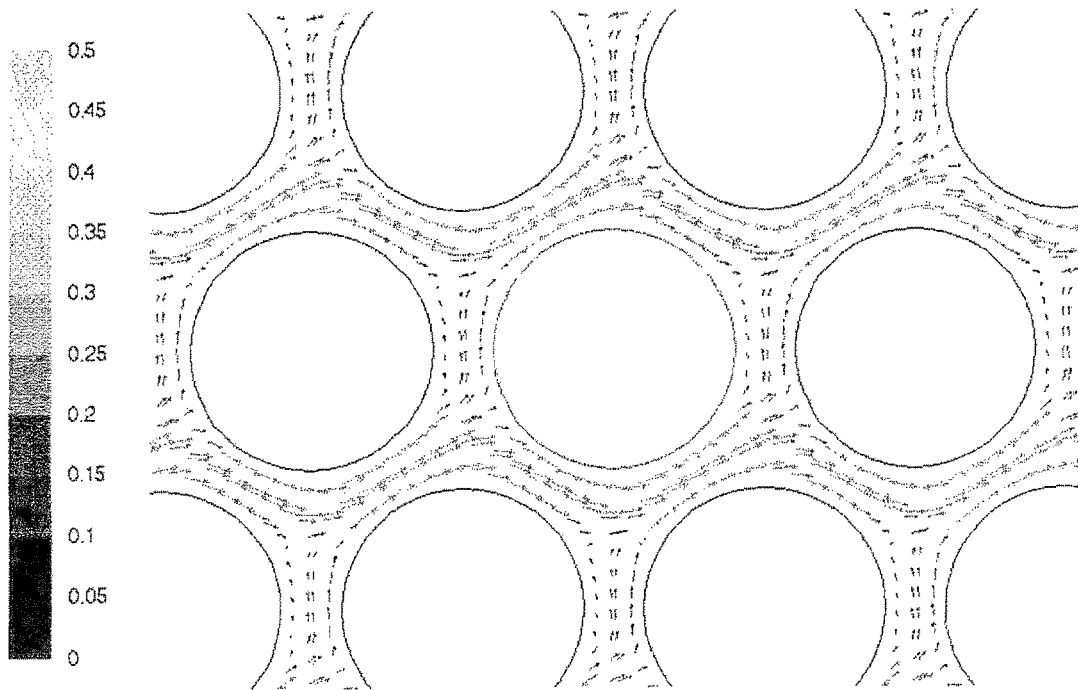
FIG. 5

Flow Condition at 20 degree



(A)

Flow Condition at 30 degree



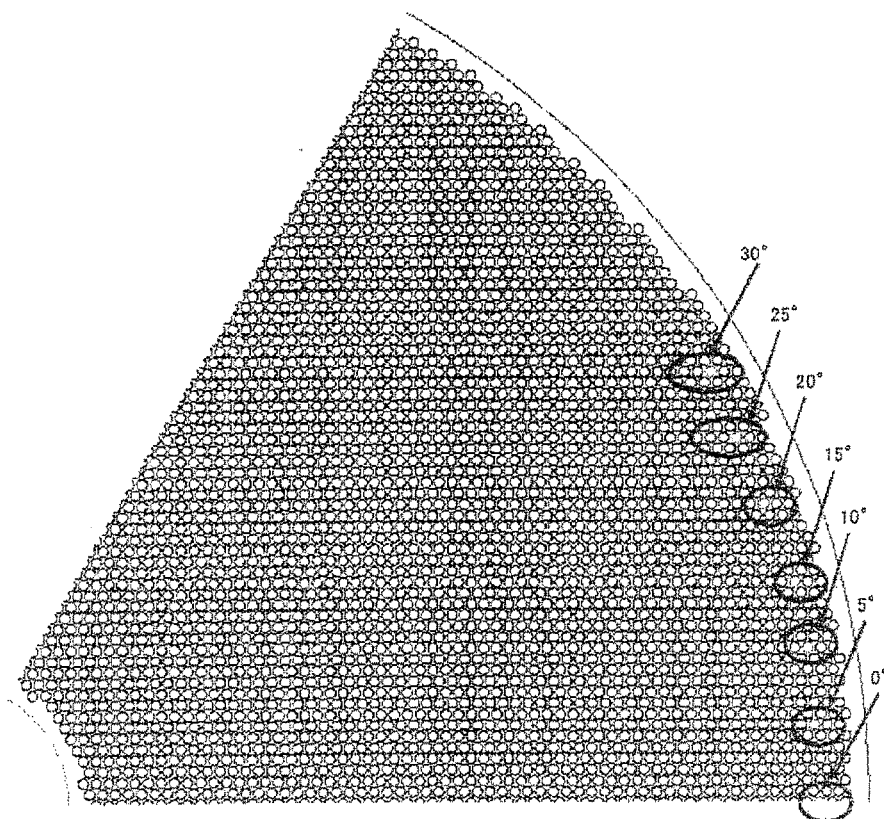
(B)

FIG. 6

Change of tube-outside film heat transfer coefficient (unit: $W/(m^2 \cdot K)$)

Angle	Flow of Heat Transfer Medium/ Reaction Tube Number (m^3 /number)			Improvement Rate (%)		
	0.2	0.3	0.4	0.2	0.3	0.4
0	1670.1	1849.2	2123.9	100.0	100.0	100.0
5	1665	1840.4	2123.2	99.7	99.5	100.0
10	1667.8	1853.6	2155.3	99.9	100.2	101.5
15	1690.5	1888.5	2194.8	101.2	102.1	103.3
20	1716.2	1915.6	2237.6	102.8	103.6	105.4
25	1734.7	1960.1	2280.8	103.9	106.0	107.4
30	1743.1	1970.2	2282	104.4	106.5	107.4

(A)



(B)

FIG. 7