

FIG. 1

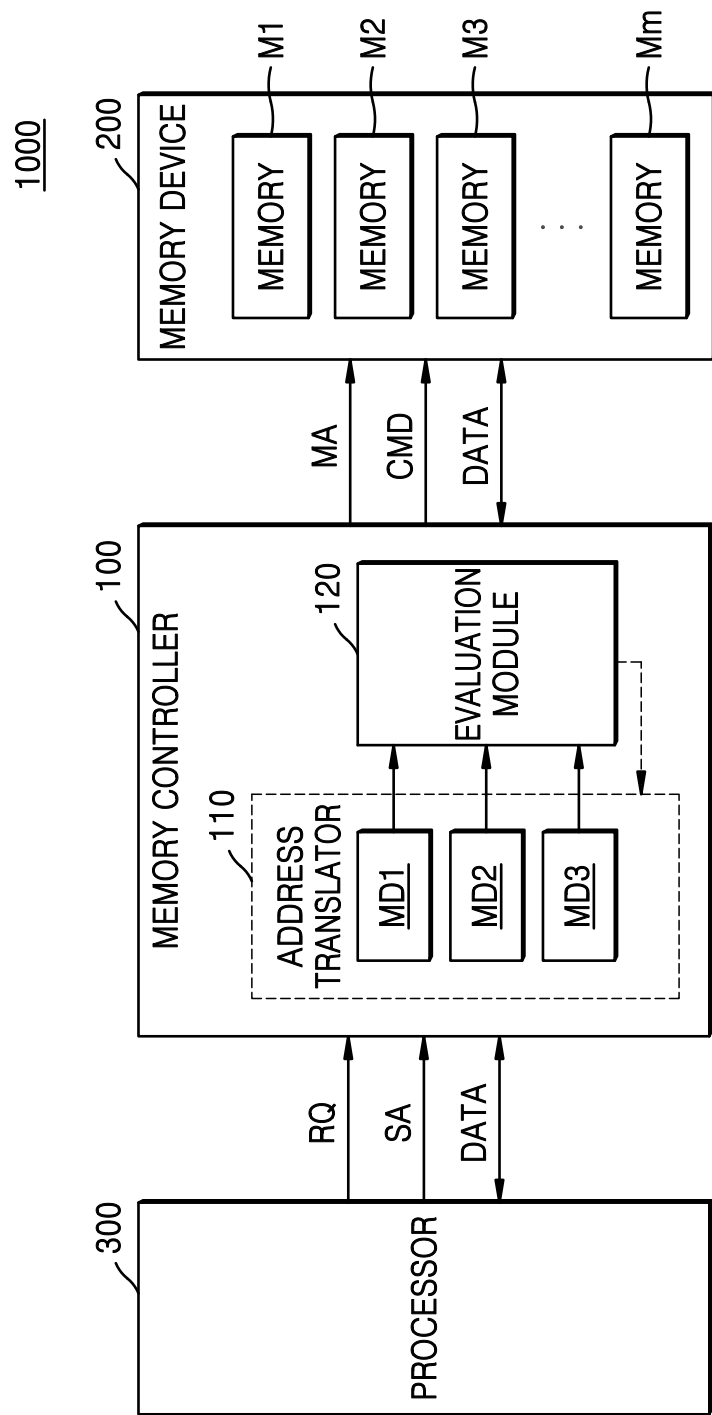


FIG. 2

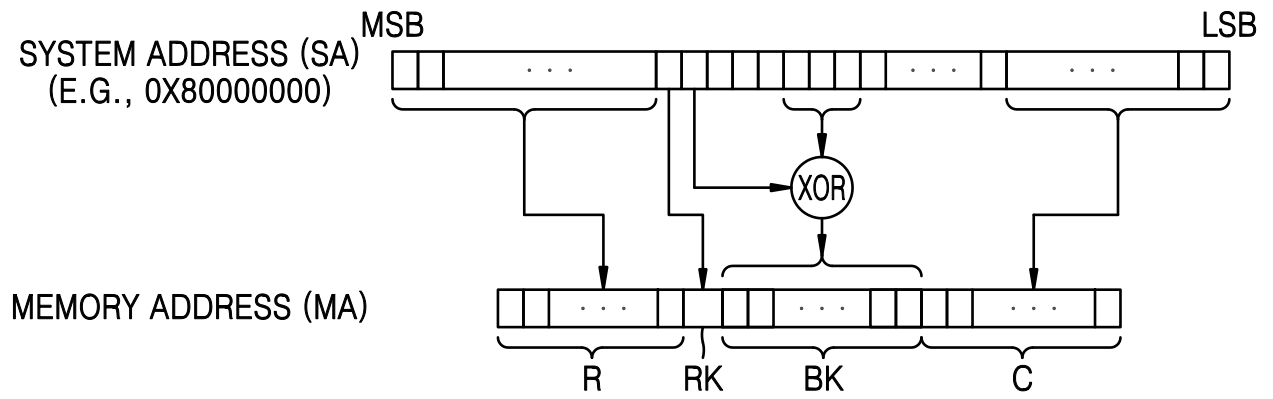


FIG. 3A

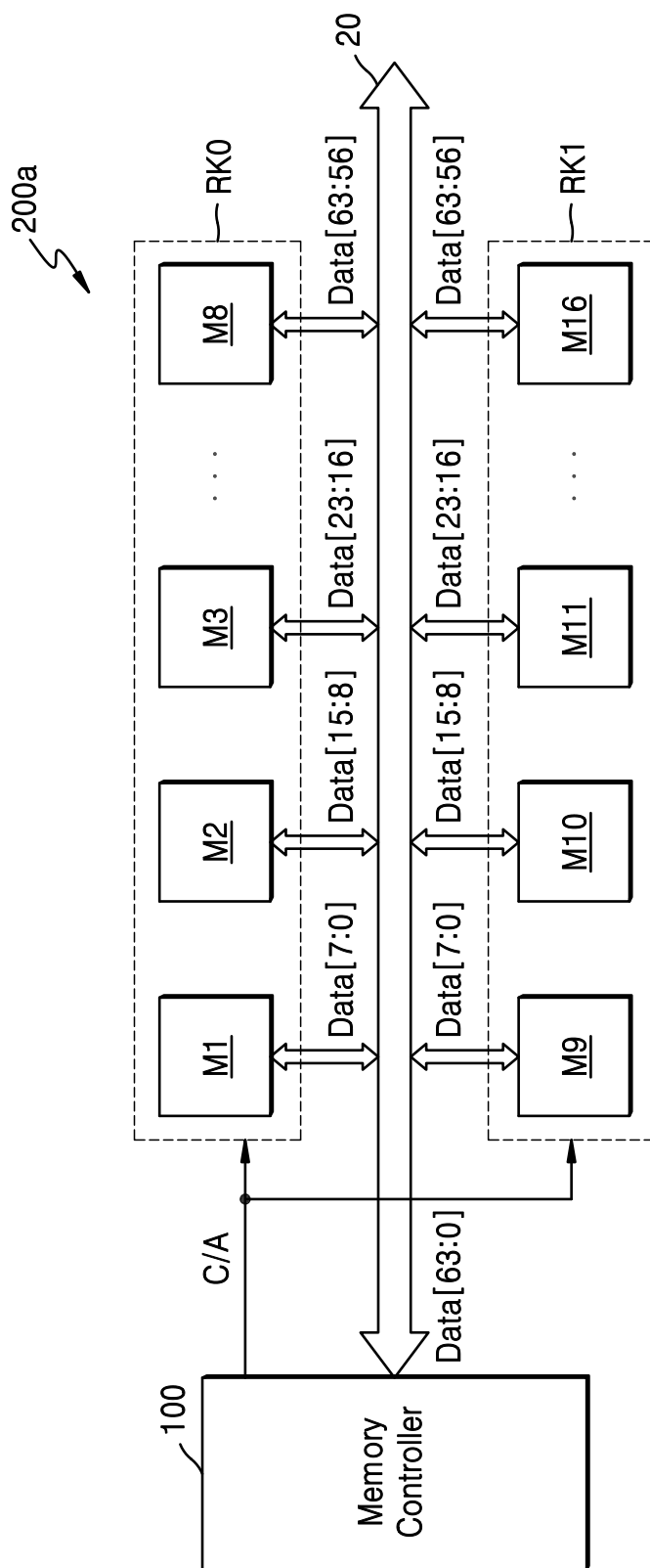


FIG. 3B

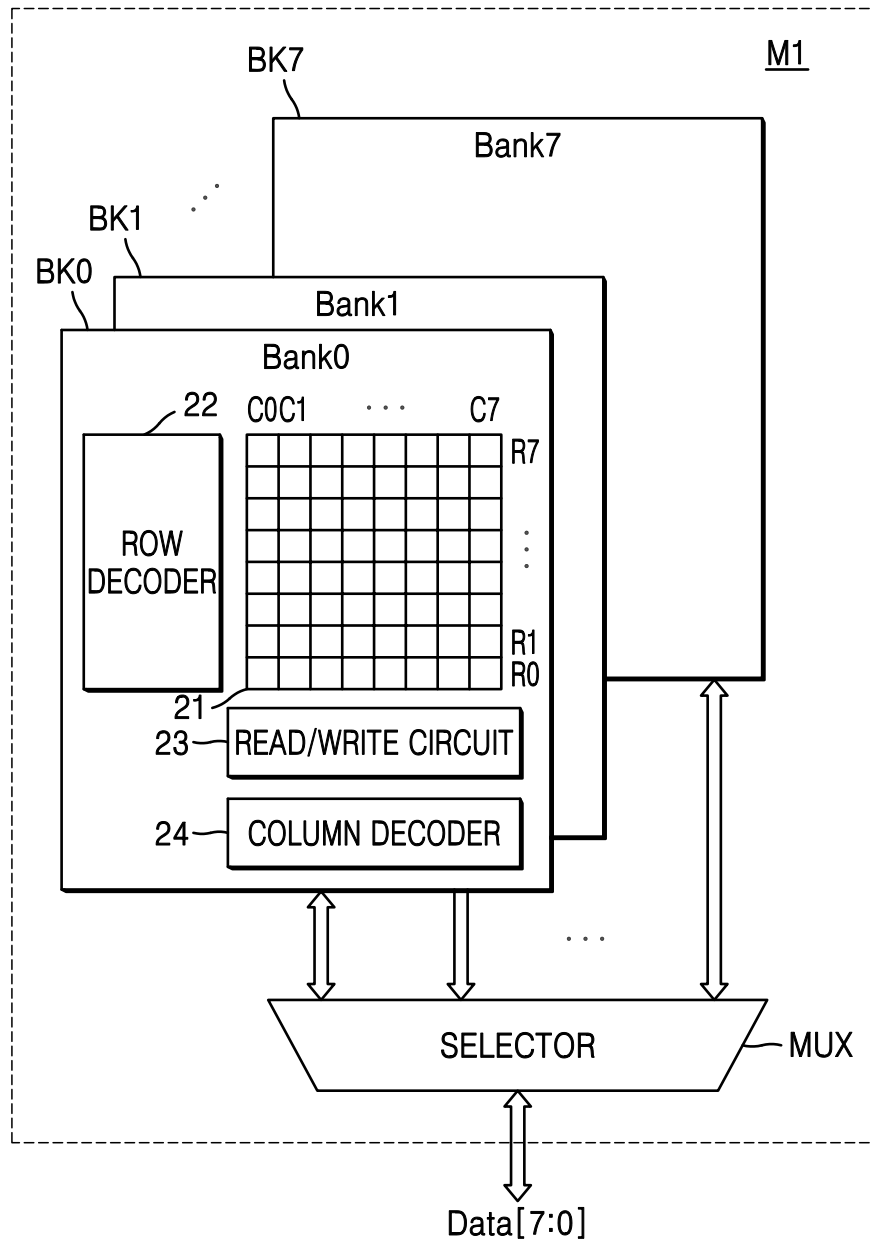


FIG. 4

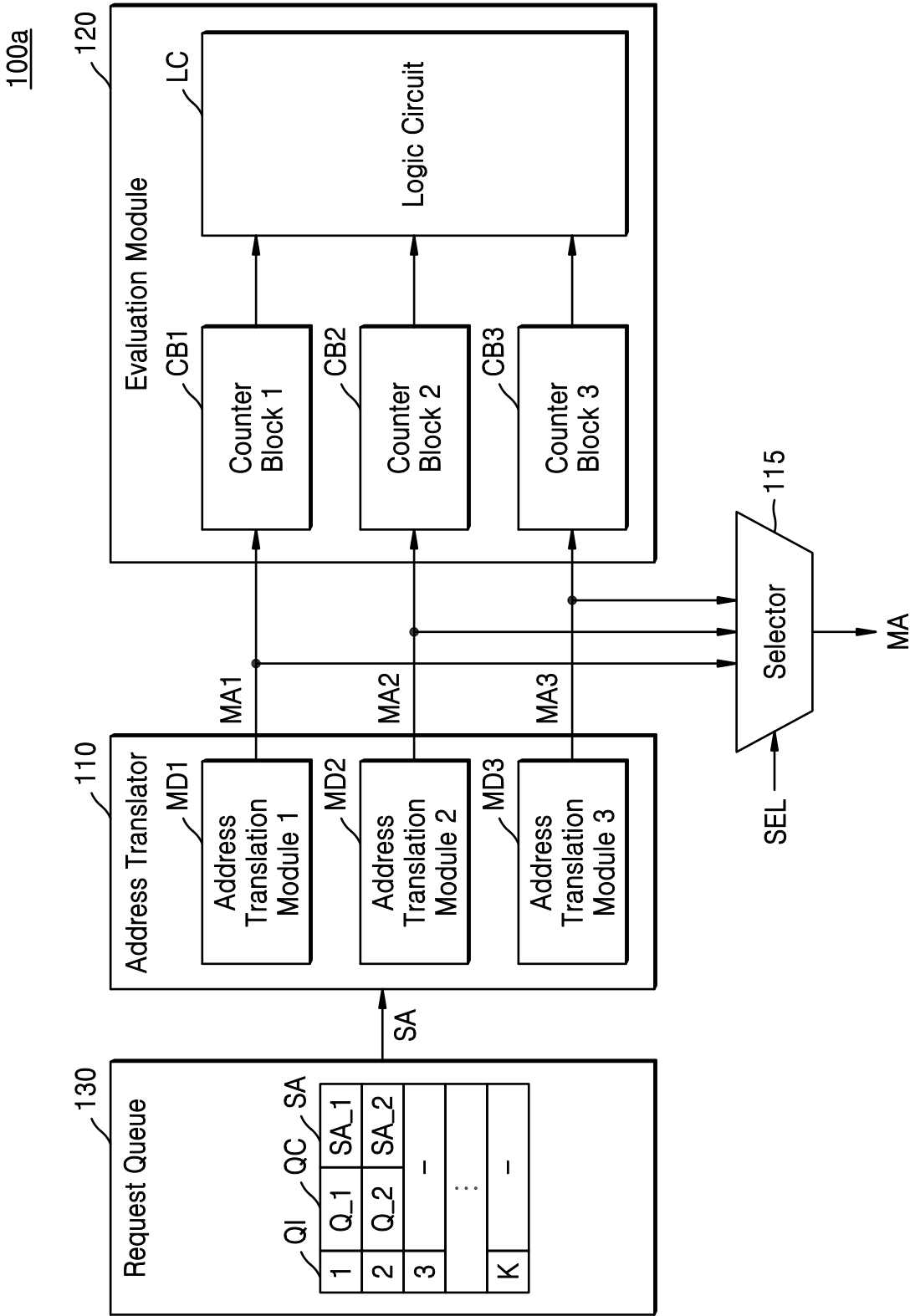


FIG. 5

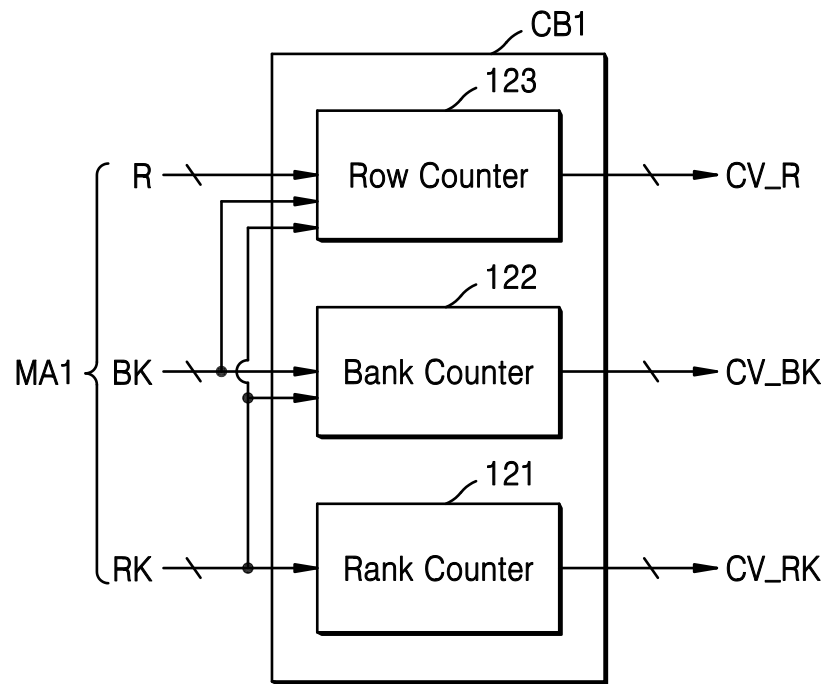


FIG. 6

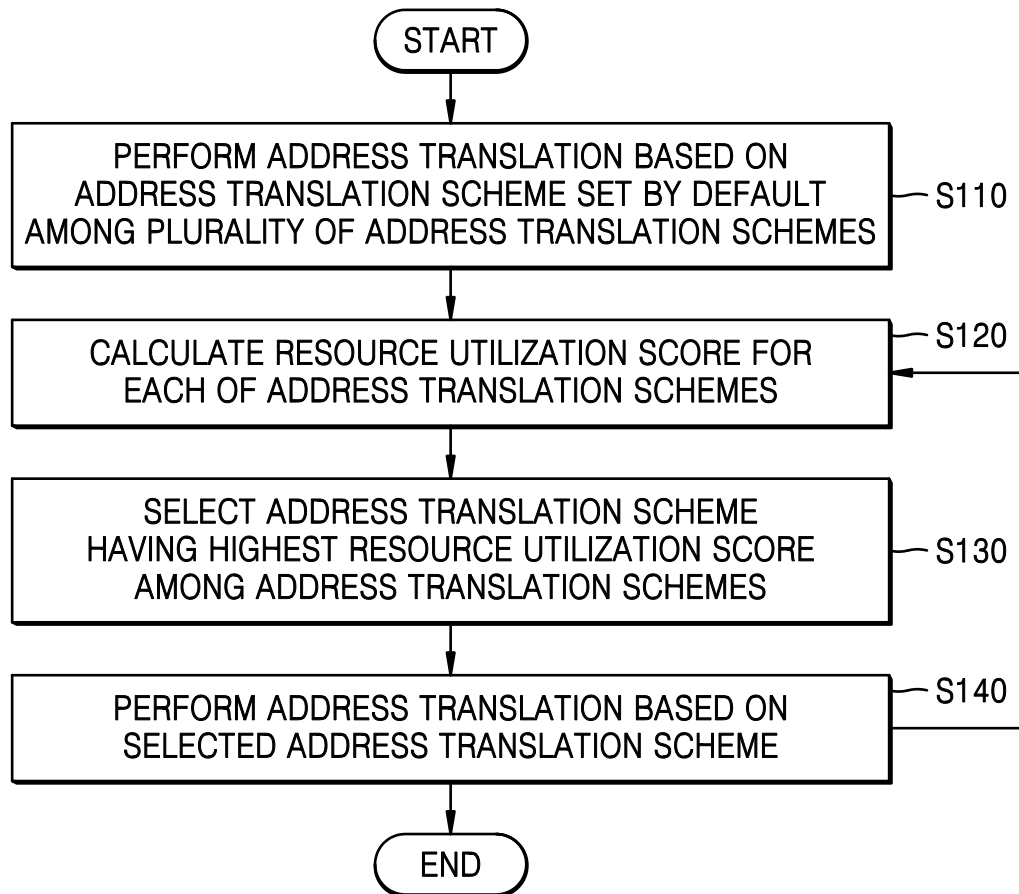


FIG. 7

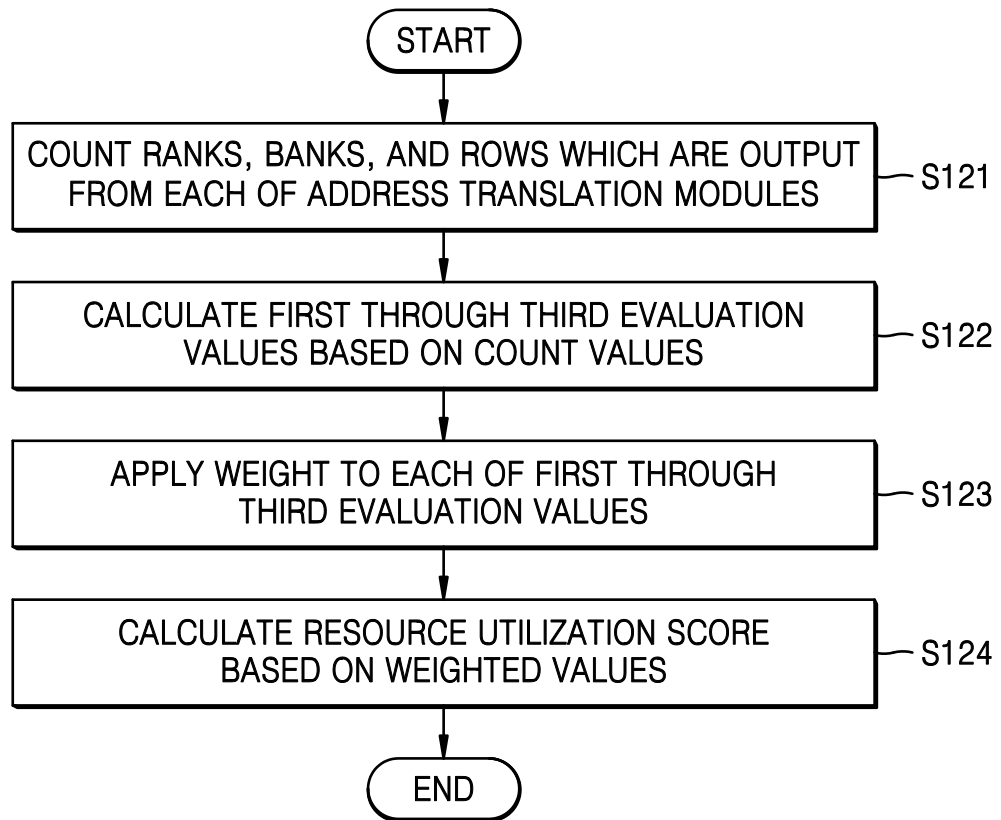


FIG. 8

Request queue index (QI)	Rank	Bank	Rows	EV1 (Max value: 2)	EV2 (Max value: 16)	EV3 (Min value: 1)
				Average rank usage [ranks]	Unique bank # [banks]	Average row usage per 'bank/rank' [unique rows/unique banks]
1	0	1	0	1.38	4	4.00
2	0	1	1			
3	0	3	0			
4	0	3	1			
5	0	3	2			
6	0	3	3			
7	0	3	4			
8	0	7	0			
9	0	7	1			
10	0	7	2			
11	0	7	3			
12	0	7	4			
13	0	7	5			
14	1	0	0			
15	1	0	1			
16	1	0	2			

Window Size: 16

FIG. 9A

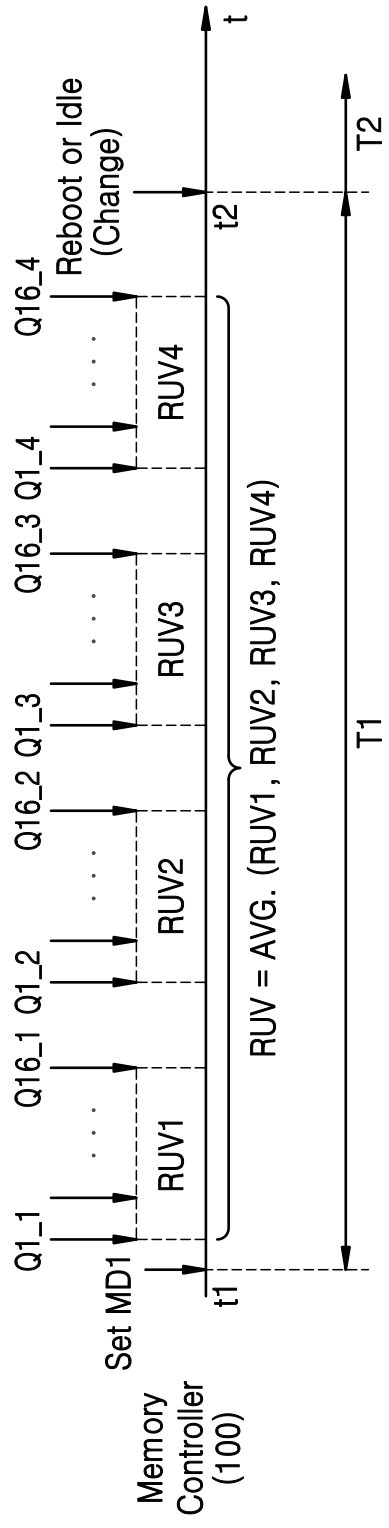


FIG. 9B

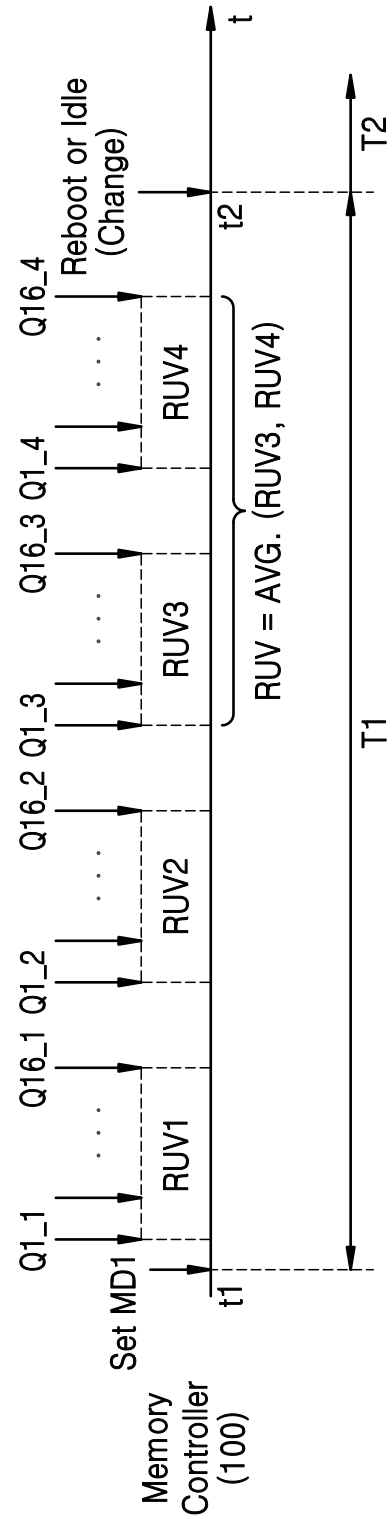


FIG. 10A

MD1 – Rank intlv: (BW-a)th bit, – Bank intlv: hashing function1		MD2 – Rank intlv: (BW-b)th bit, – Bank intlv: hashing function2		MD3 – Rank intlv: (BW-c)th bit, – Bank intlv: hashing function3	
EV1 (rank)	–	EV1 (rank)	–	EV1 (rank)	–
EV2 (bank)	–	EV2 (bank)	–	EV2 (bank)	–
EV3 (row)	–	EV3 (row)	–	EV3 (row)	–
RUV	–	RUV	–	RUV	–

FIG. 10B

MD1 – Rank intlv: (BW-a)th bit, – Bank intlv: hashing function1		MD2 – Rank intlv: (BW-b)th bit, – Bank intlv: hashing function2		MD3 – Rank intlv: (BW-c)th bit, – Bank intlv: hashing function3	
EV1 (rank)	1.38	EV1 (rank)	1.5	EV1 (rank)	1.38
EV2 (bank)	4	EV2 (bank)	12	EV2 (bank)	11
EV3 (row)	4	EV3 (row)	1.25	EV3 (row)	1.36
RUV	38.67	RUV	67.13	RUV	58.86

MD1 selected(Default)
MD2 and MD3 (Background count)

FIG. 10C

MD1		MD2		MD3	
– Rank intlv: (BW-a)th bit, – Bank intlv: hashing function1		– Rank intlv: (BW-b)th bit, – Bank intlv: hashing function2		– Rank intlv: (BW-c)th bit, – Bank intlv: hashing function3	
EV1 (rank)	1.25	EV1 (rank)	1.38	EV1 (rank)	1.5
EV2 (bank)	10	EV2 (bank)	9	EV2 (bank)	11
EV3 (row)	1.5	EV3 (row)	1.33	EV3 (row)	1
RUV	50.55	RUV	54.02	RUV	64.99

MD2 selected
MD1 and MD3 (Background count)

FIG. 10D

MD1 – Rank intlv: (BW–a)th bit, – Bank intlv: hashing function1		MD2 – Rank intlv: (BW–b)th bit, – Bank intlv: hashing function2		MD3 – Rank intlv: (BW–c)th bit, – Bank intlv: hashing function3	
EV1 (rank)	1.5	EV1 (rank)	1.5	EV1 (rank)	1.75
EV2 (bank)	12	EV2 (bank)	11	EV2 (bank)	13
EV3 (row)	1.33	EV3 (row)	1.36	EV3 (row)	1.23
RUV	67.03	RUV	64.56	RUV	81

MD3 selected
MD1 and MD2 (Background count)

FIG. 10E

MD1 – Rank intlv: (BW-a)th bit, – Bank intlv: hashing function1		MD2 – Rank intlv: (BW-b)th bit, – Bank intlv: hashing function2		MD3 – Rank intlv: (BW-c)th bit, – Bank intlv: hashing function3	
EV1 (rank)	1.88	EV1 (rank)	1.75	EV1 (rank)	2
EV2 (bank)	13	EV2 (bank)	14	EV2 (bank)	9
EV3 (row)	1.15	EV3 (row)	1	EV3 (row)	1.11
RUV	68.8	RUV	83.72	RUV	82.81

MD3 selected
MD1 and MD2 (Background count)

FIG. 11

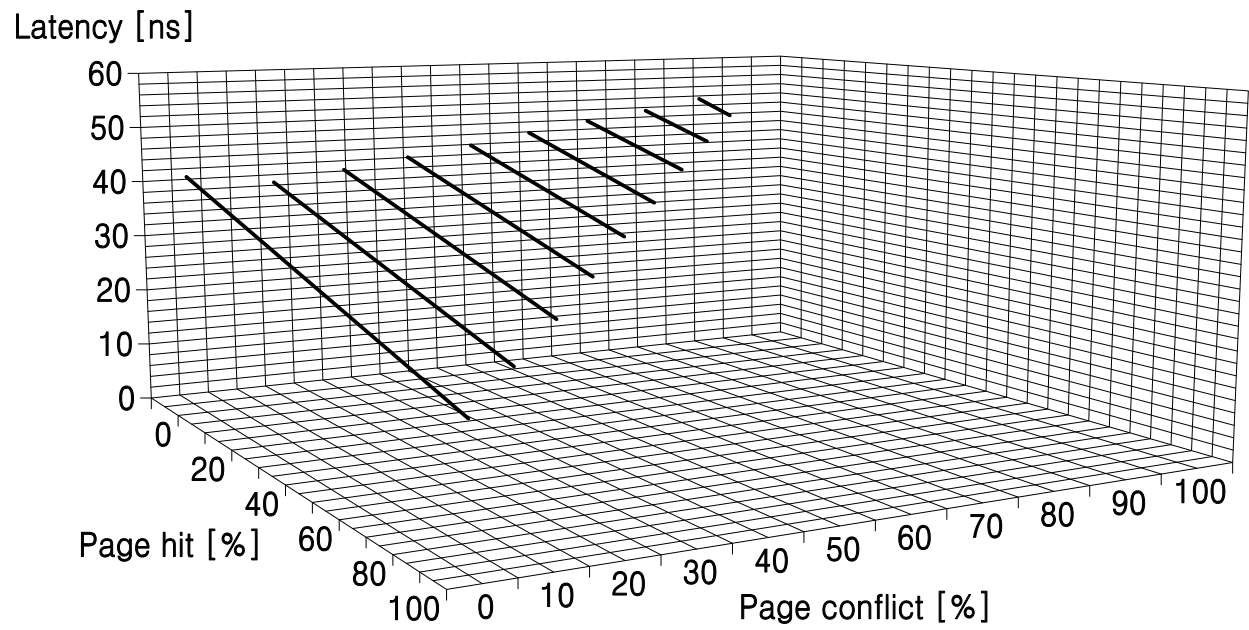


FIG. 12

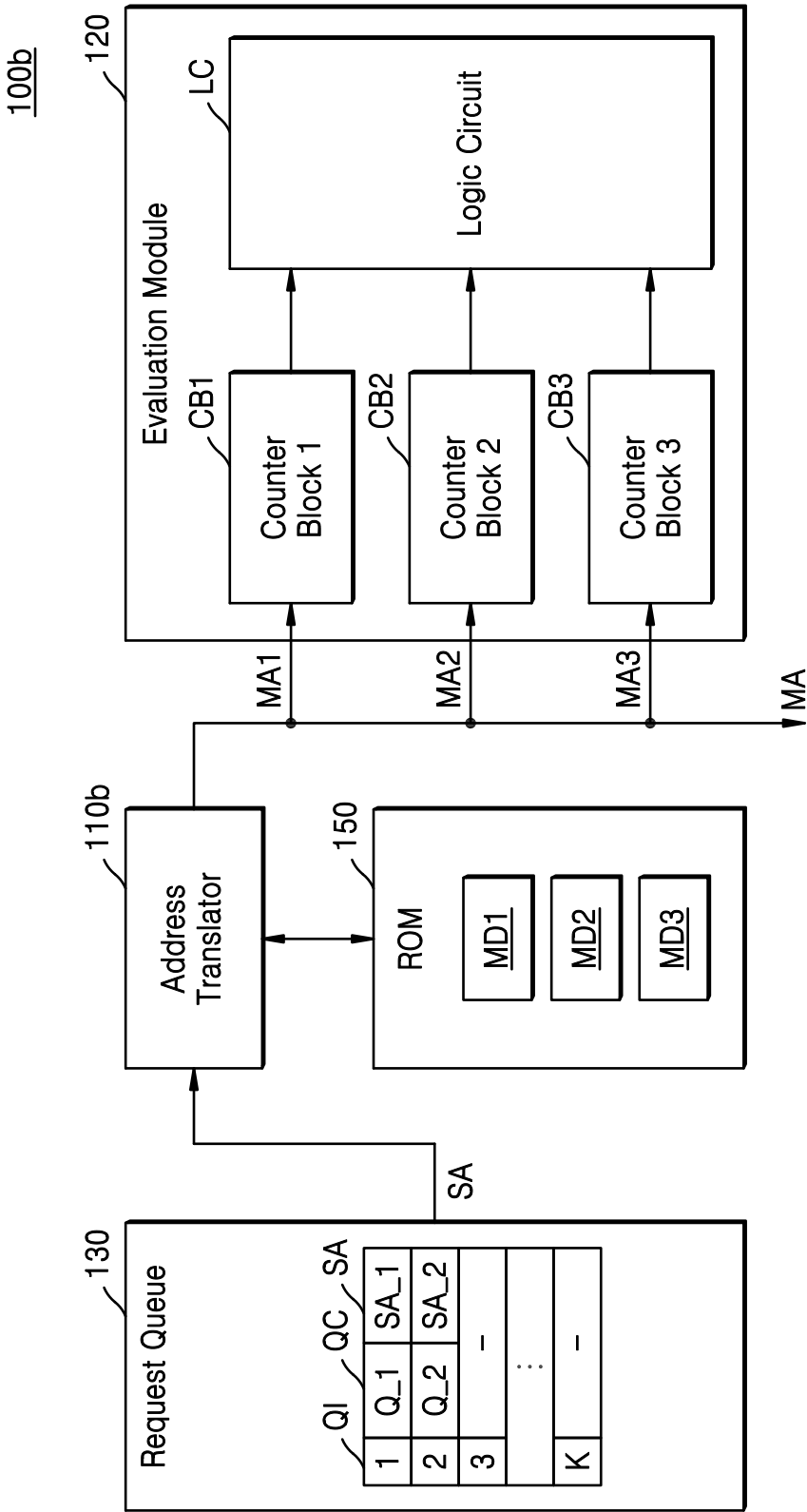


FIG. 13

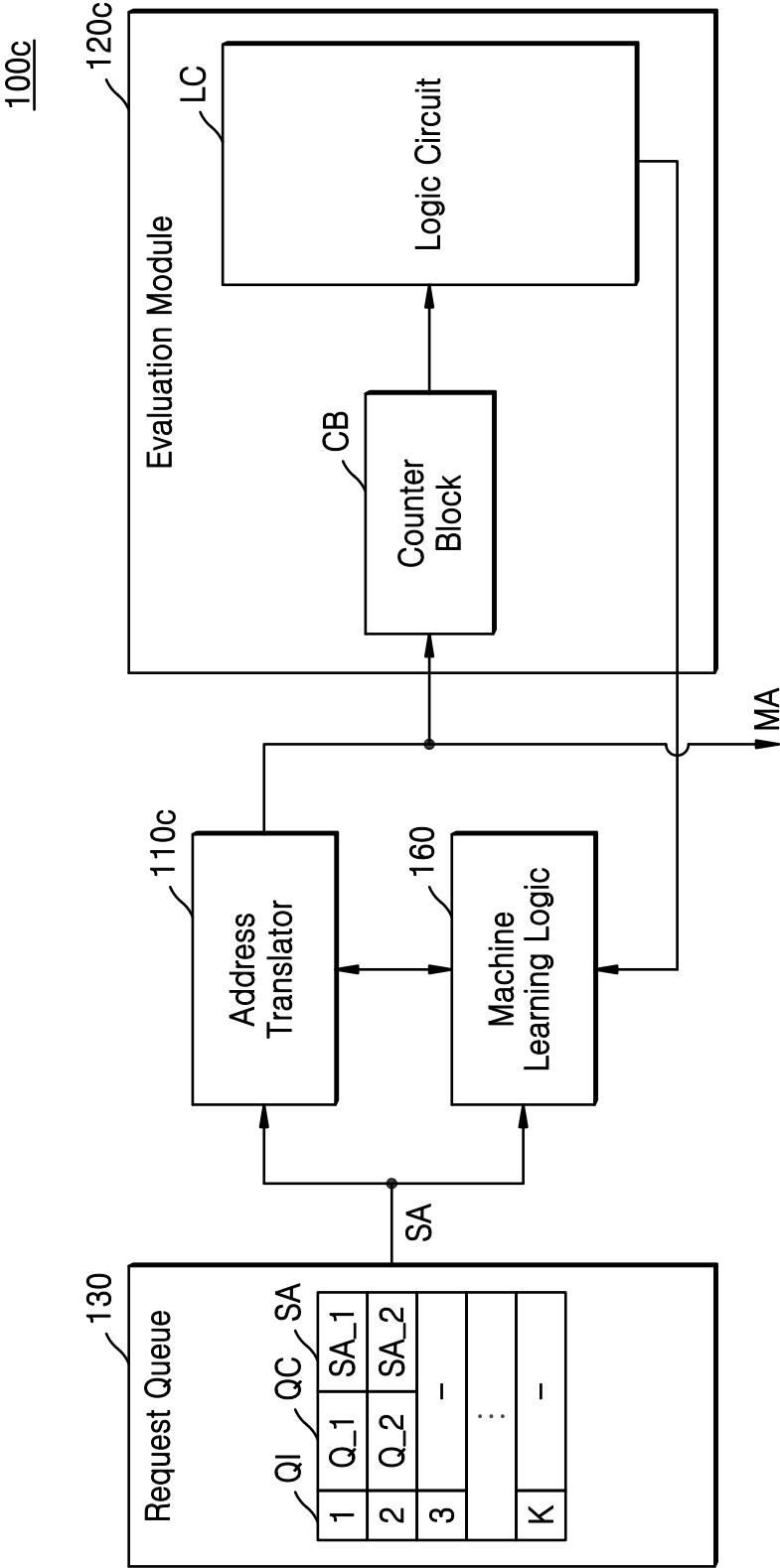


FIG. 14

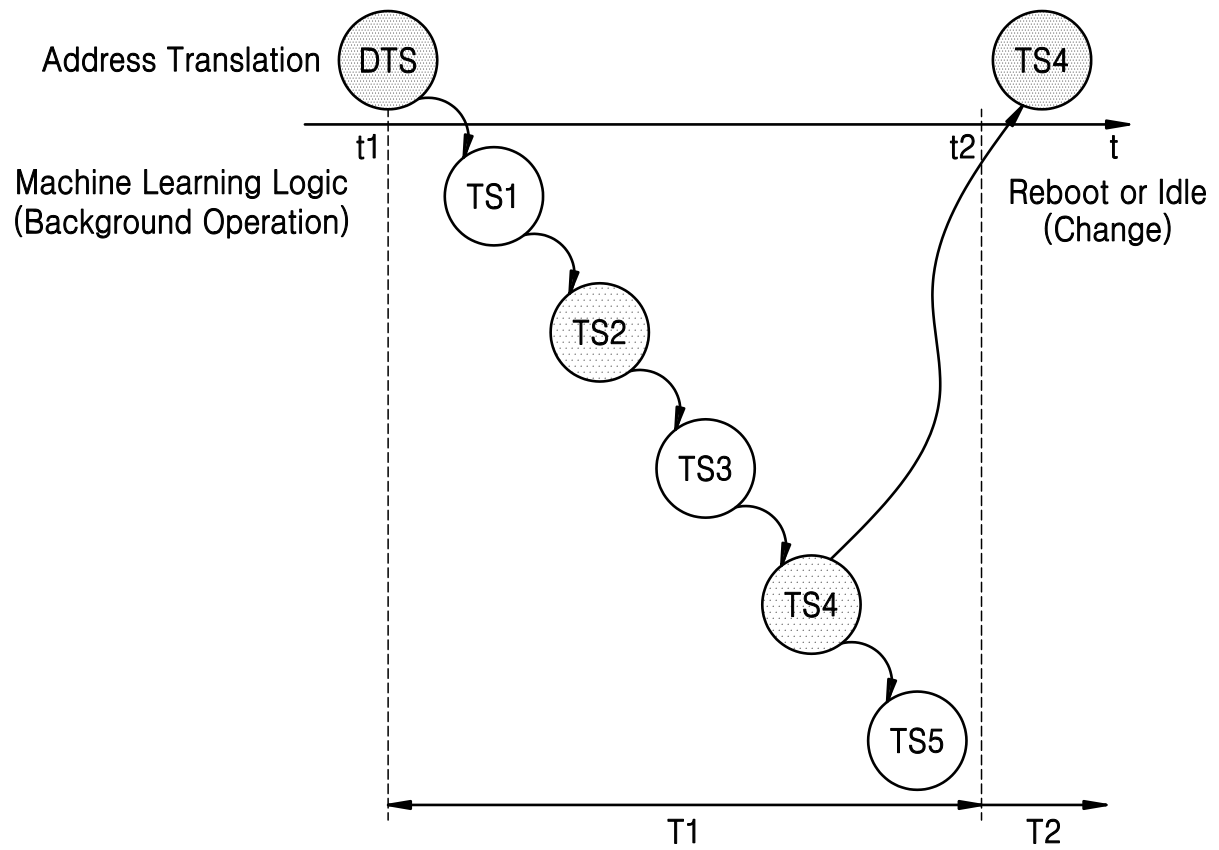


FIG. 15

