

Fig. 1

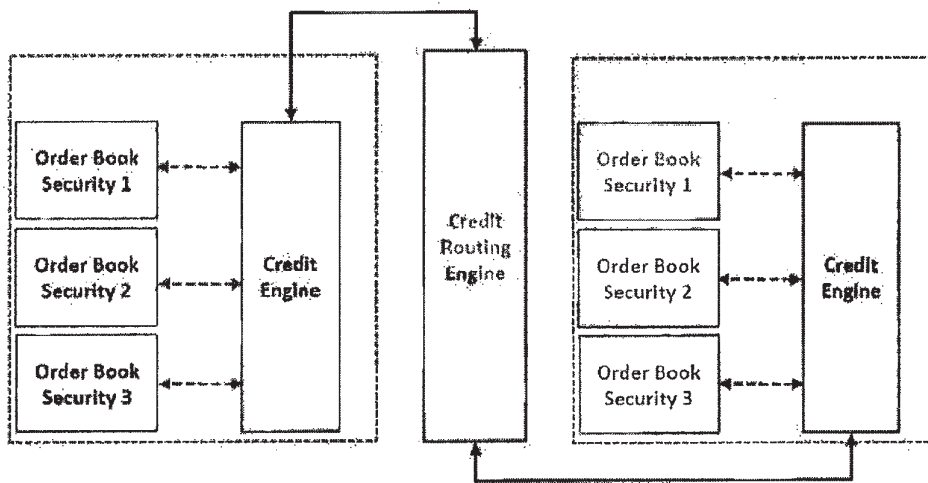


Fig. 2
Related Art

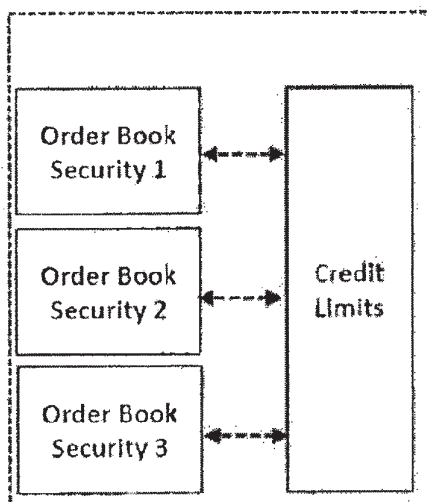
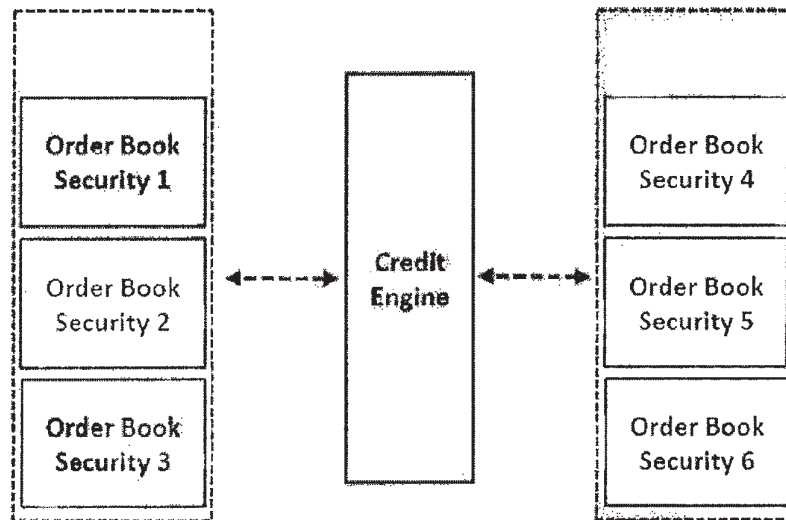


Fig. 3
Related Art



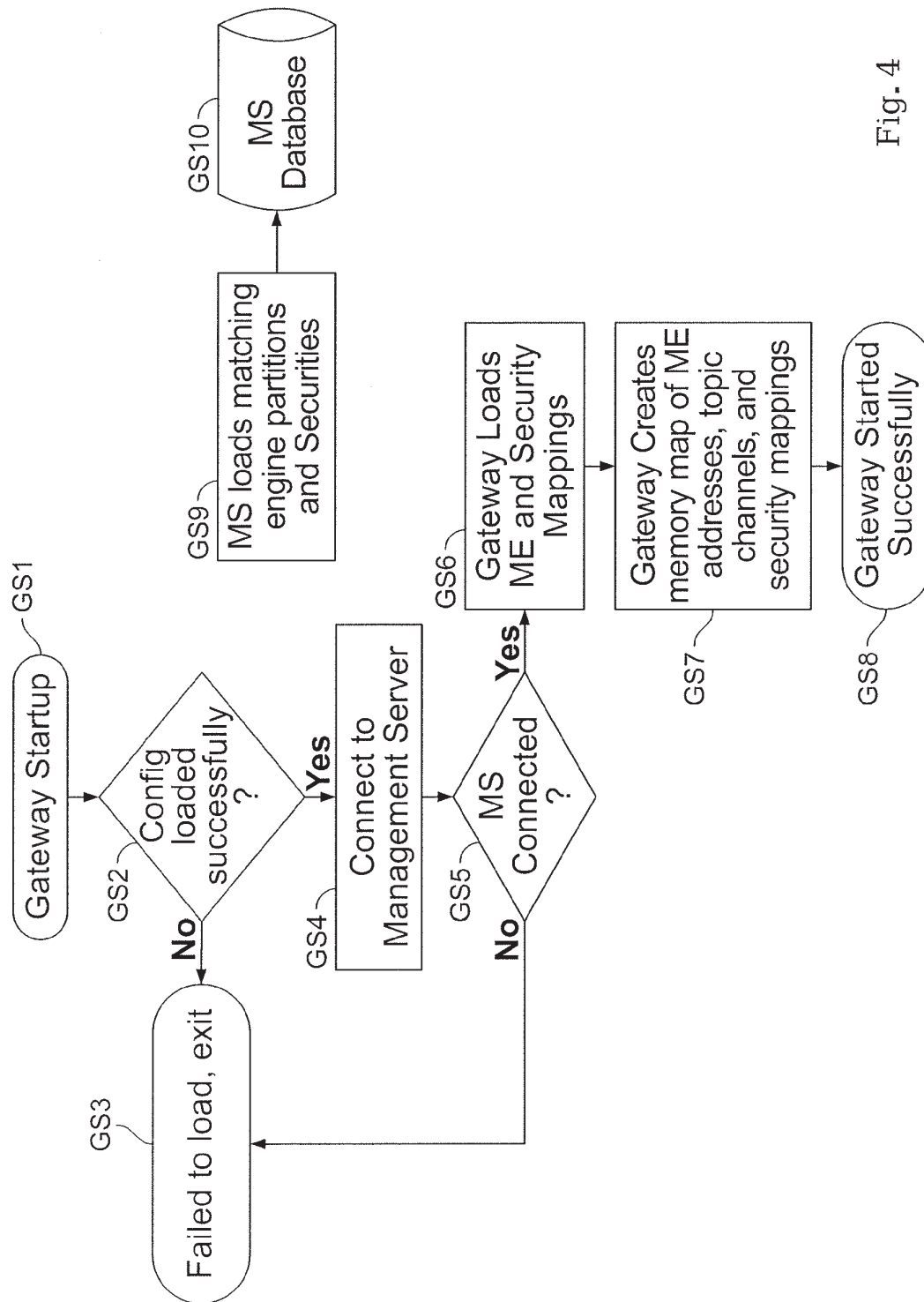


Fig. 4

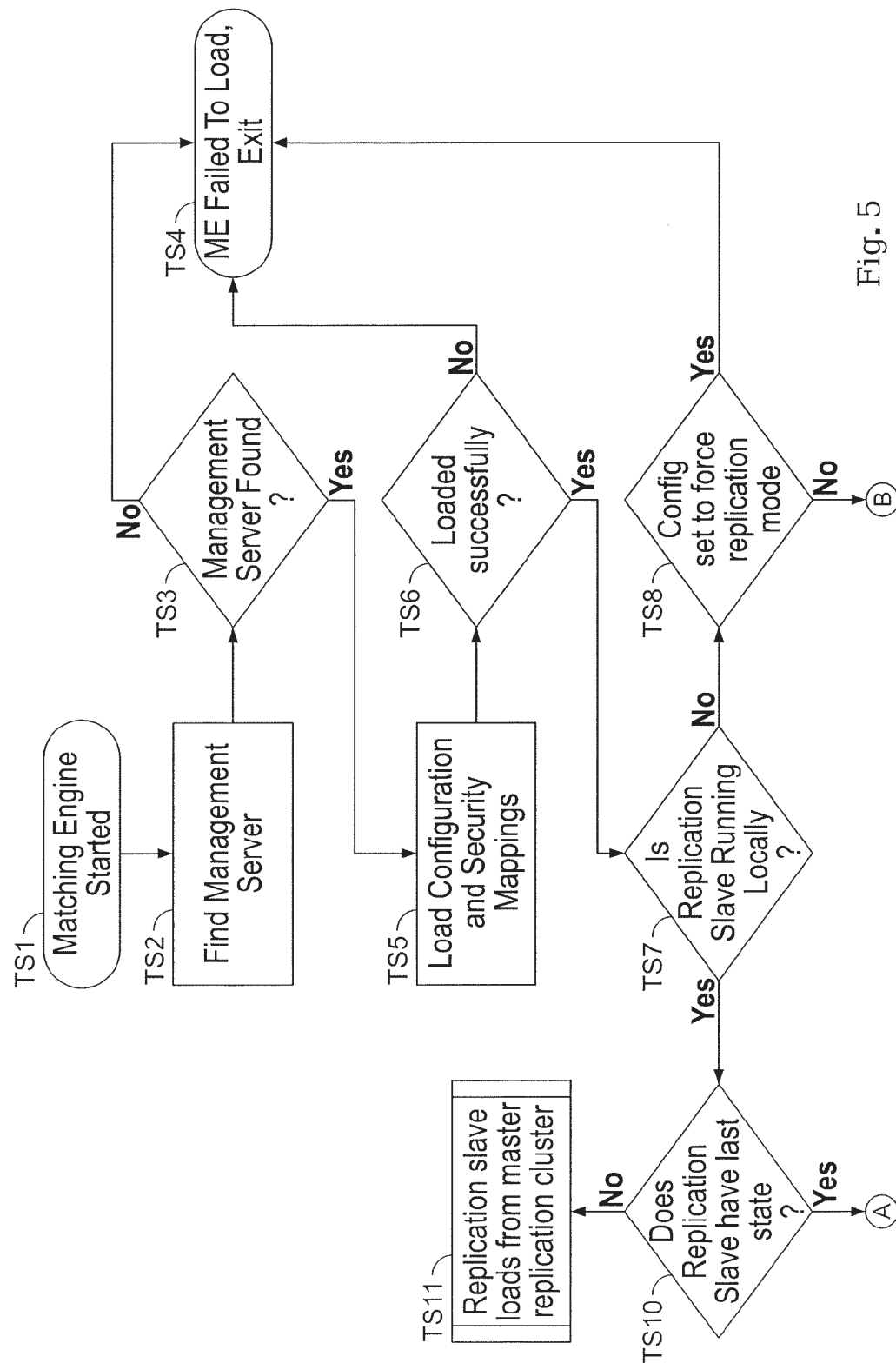


Fig. 5

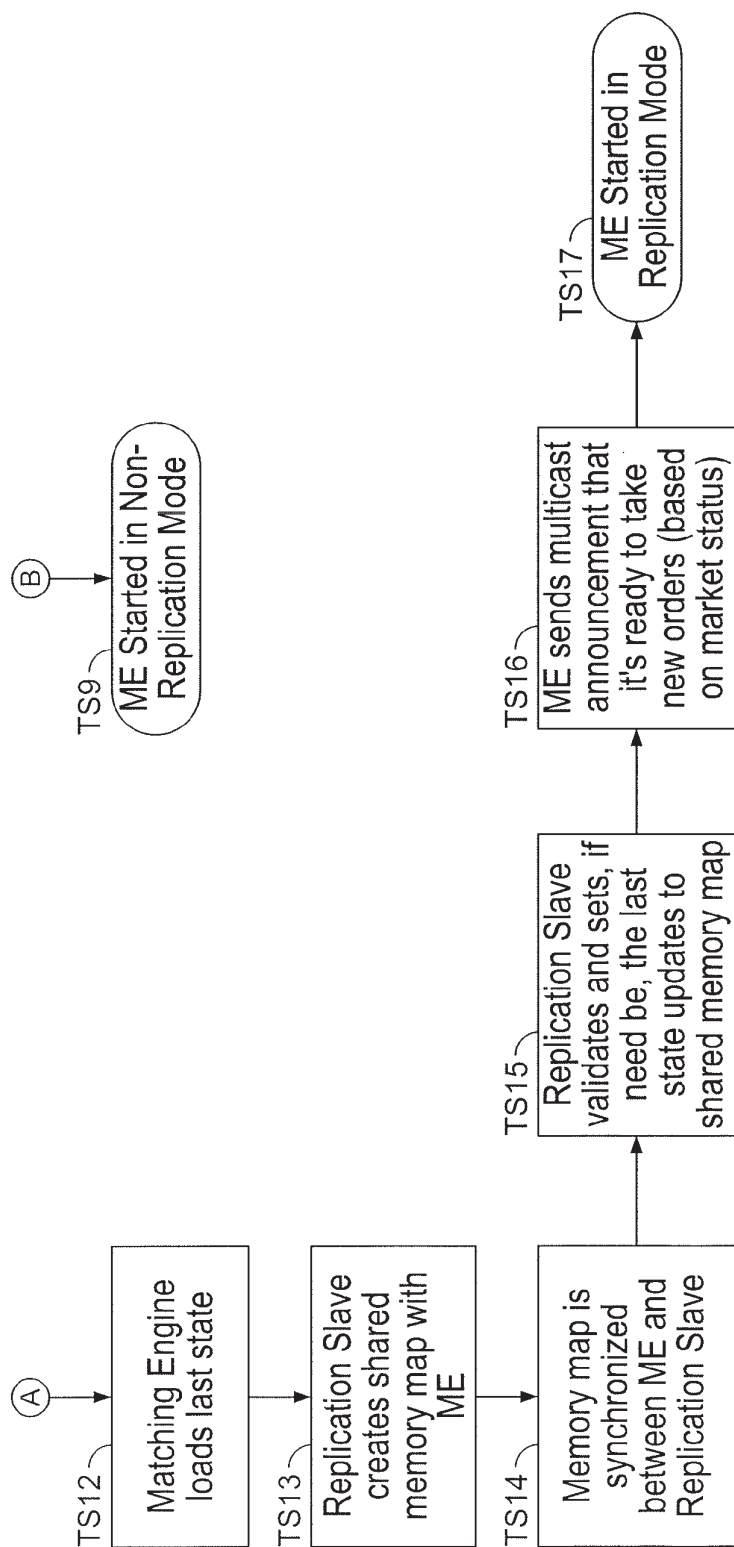


Fig. 5 (Cont.)

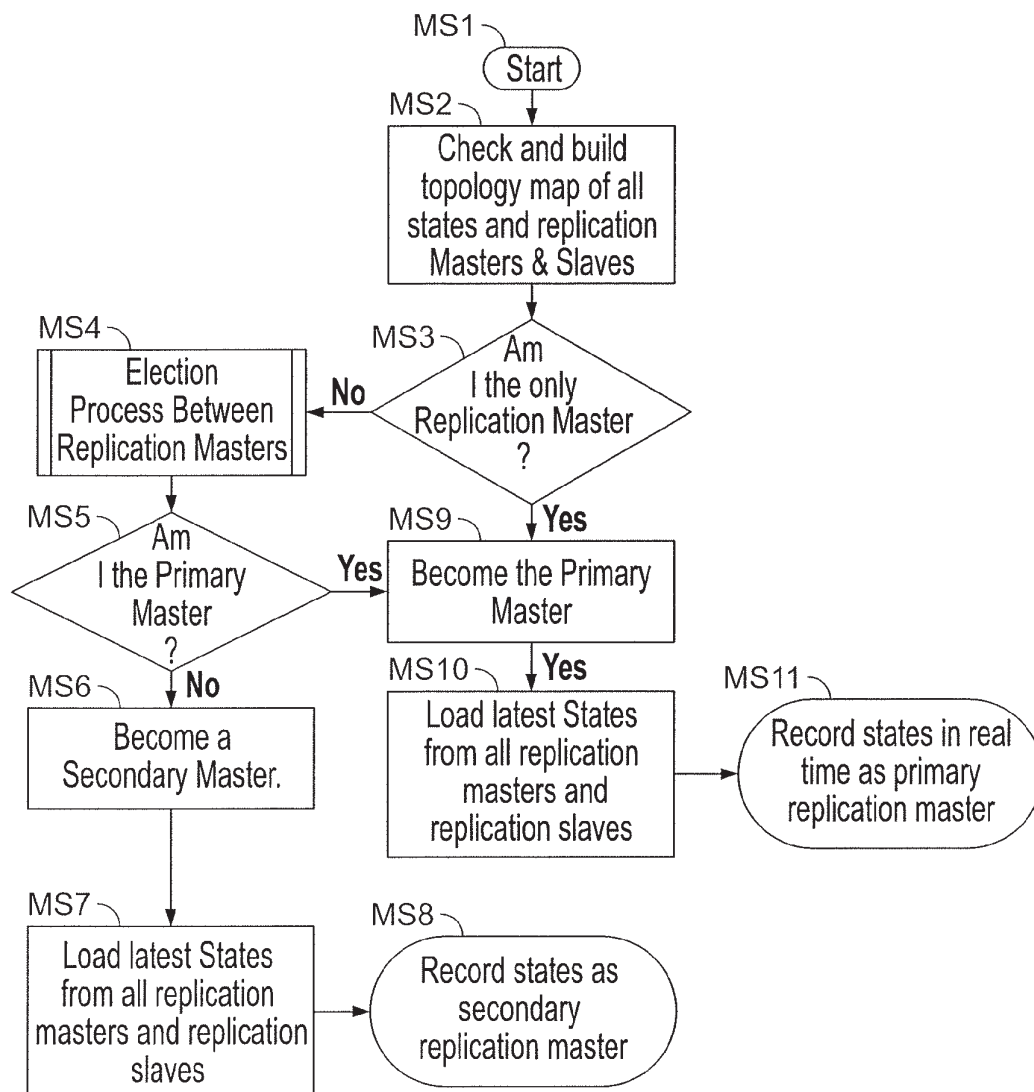


Fig. 6

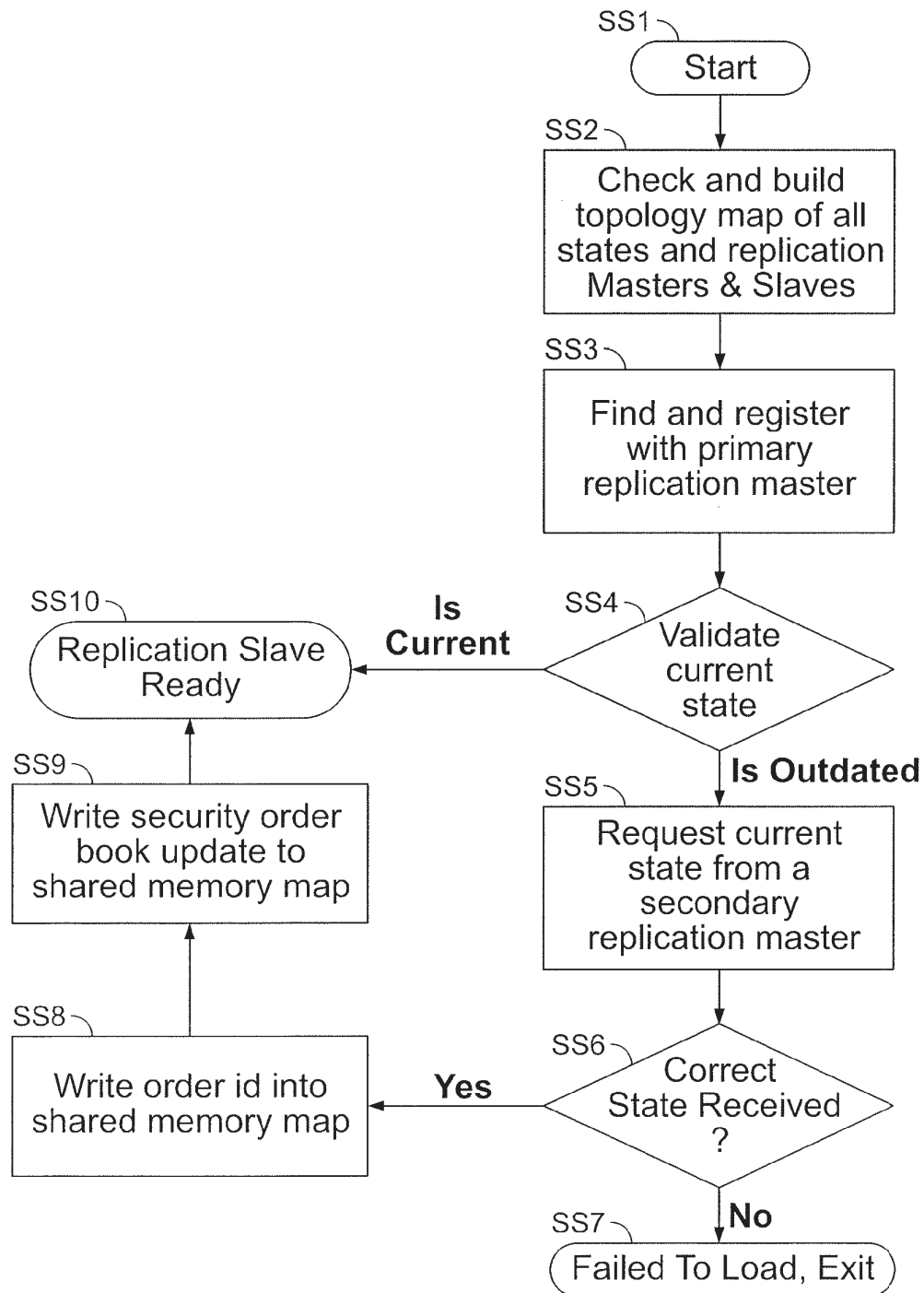


Fig. 7

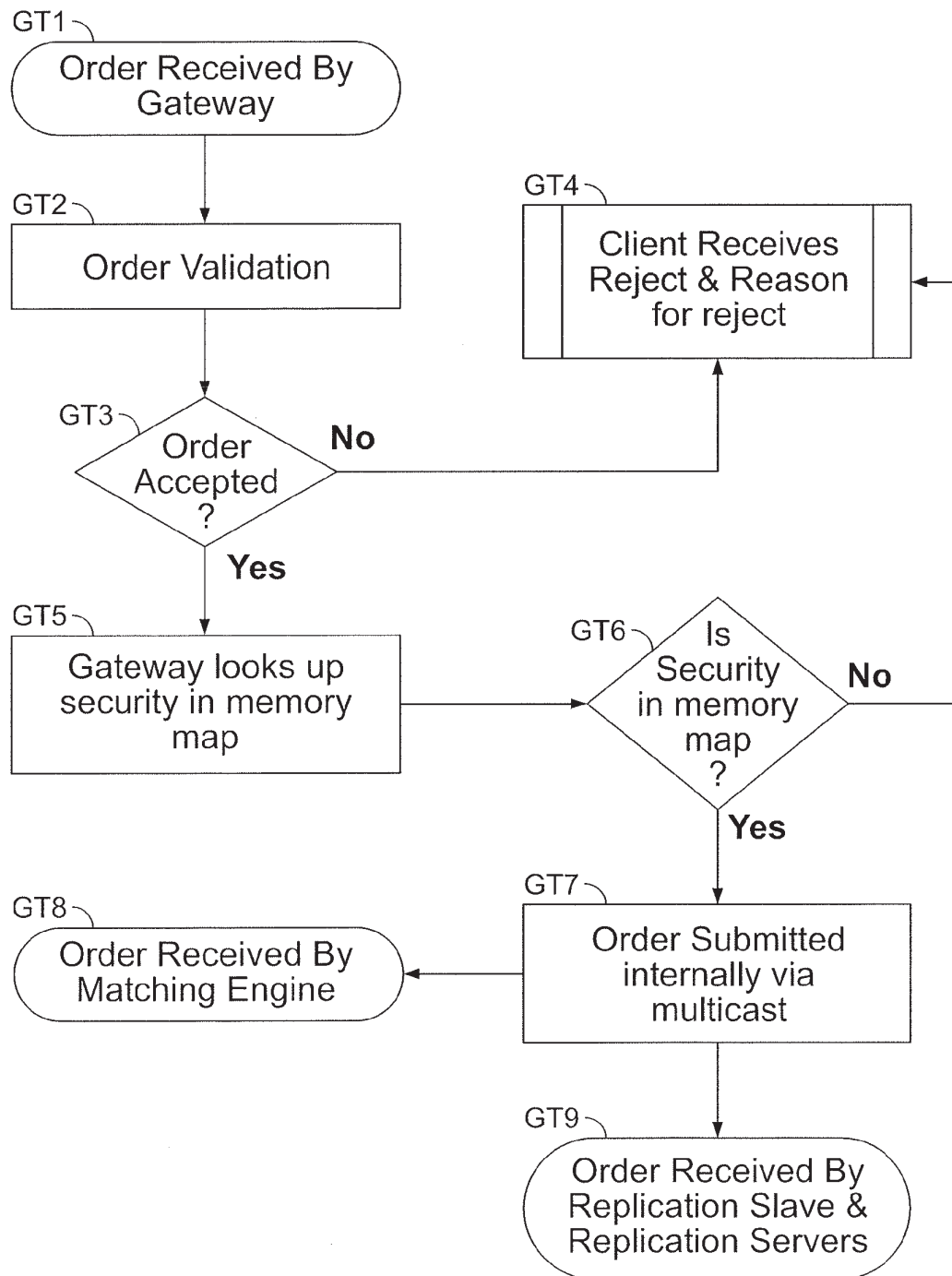
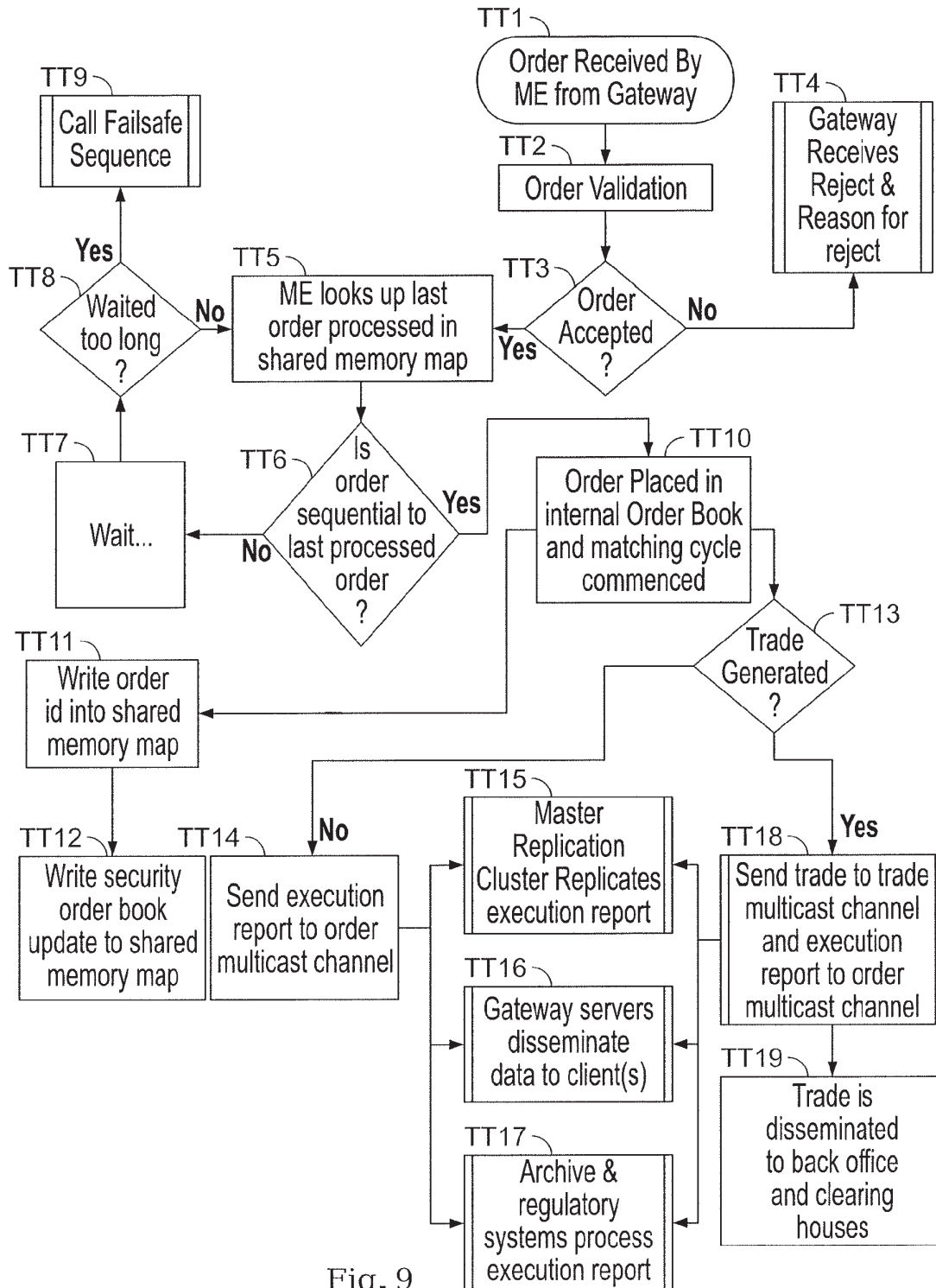


Fig. 8



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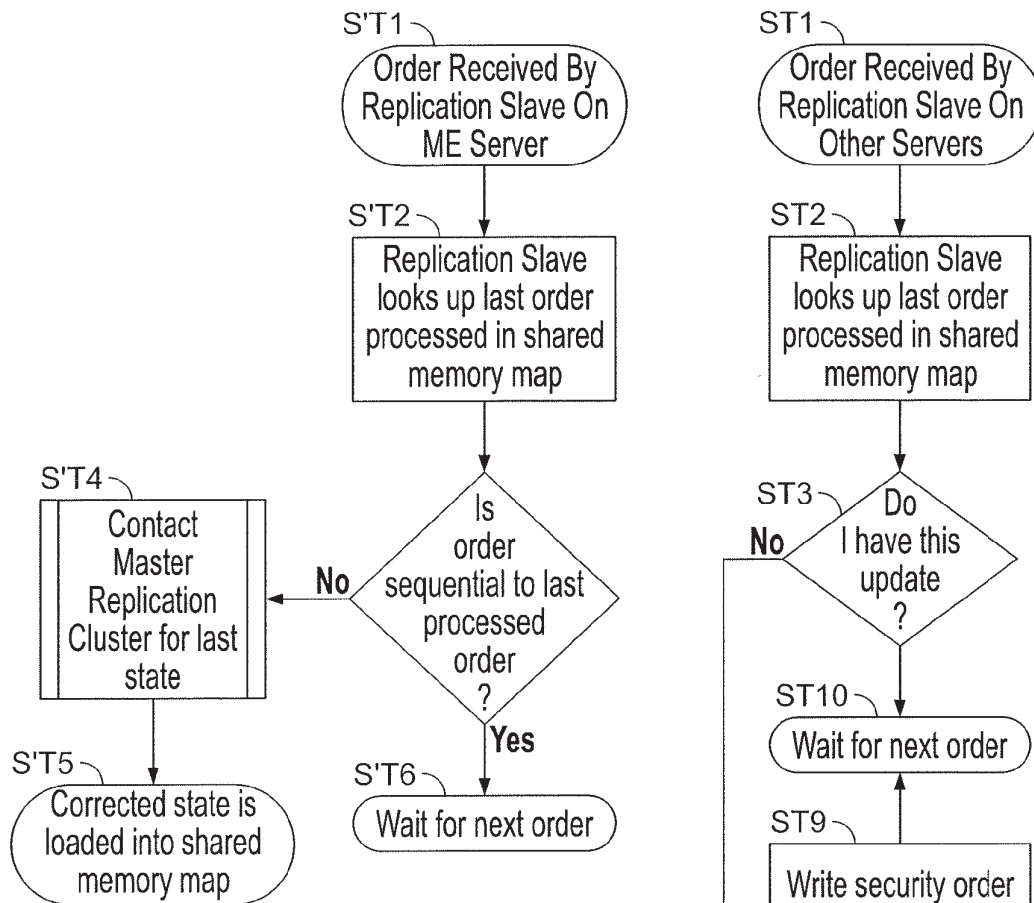


Fig. 10

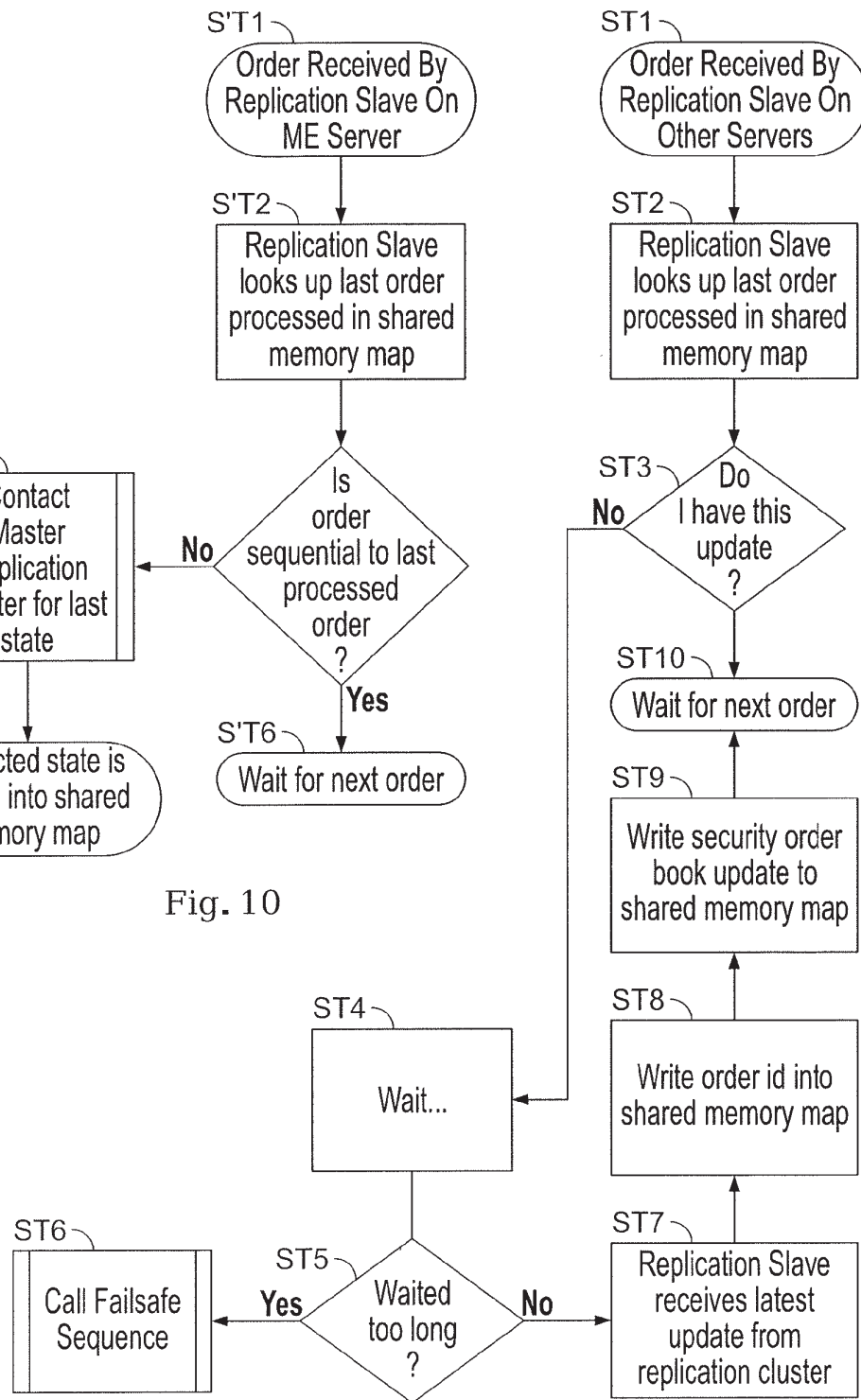


Fig. 11

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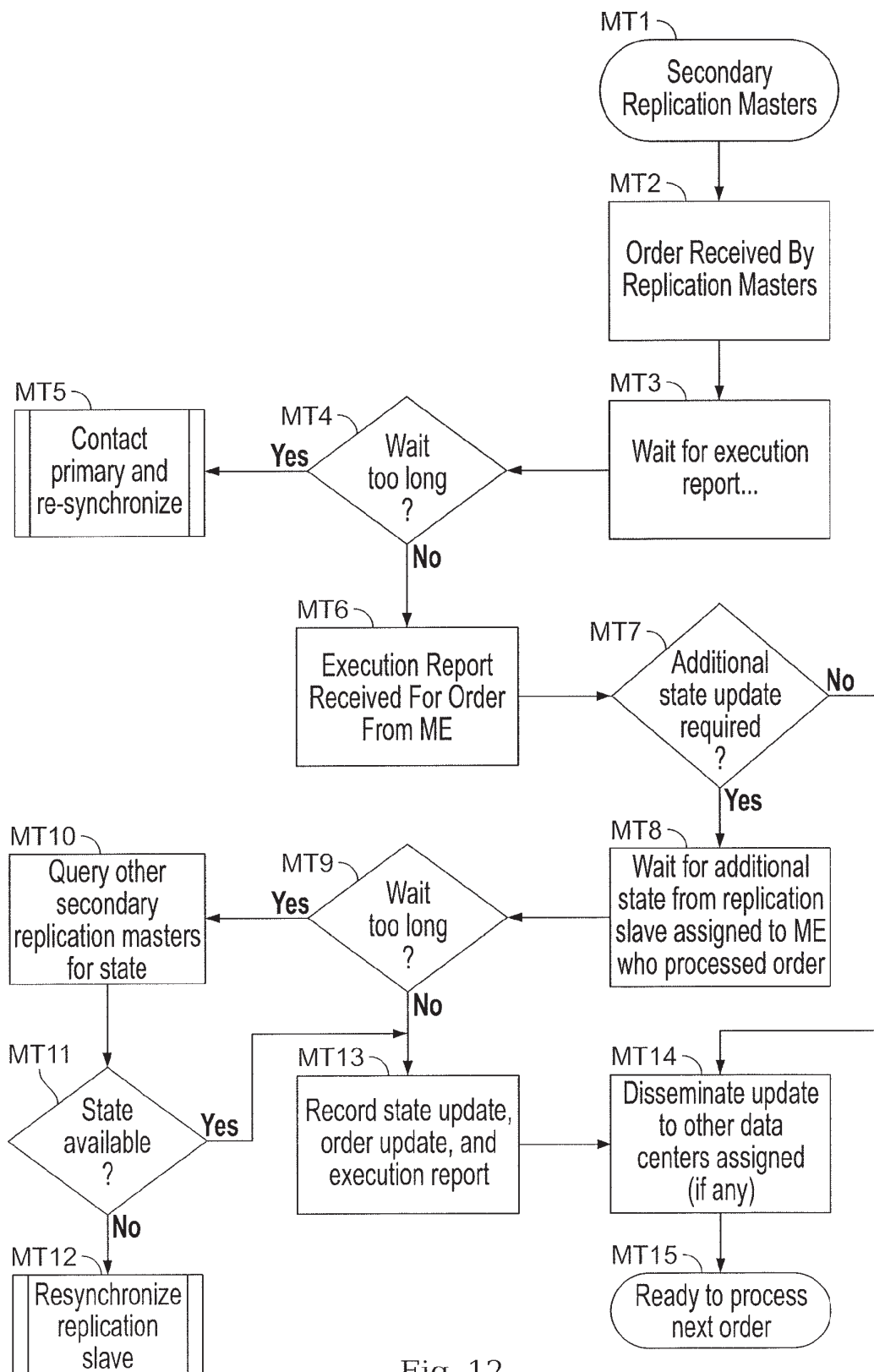


Fig. 12

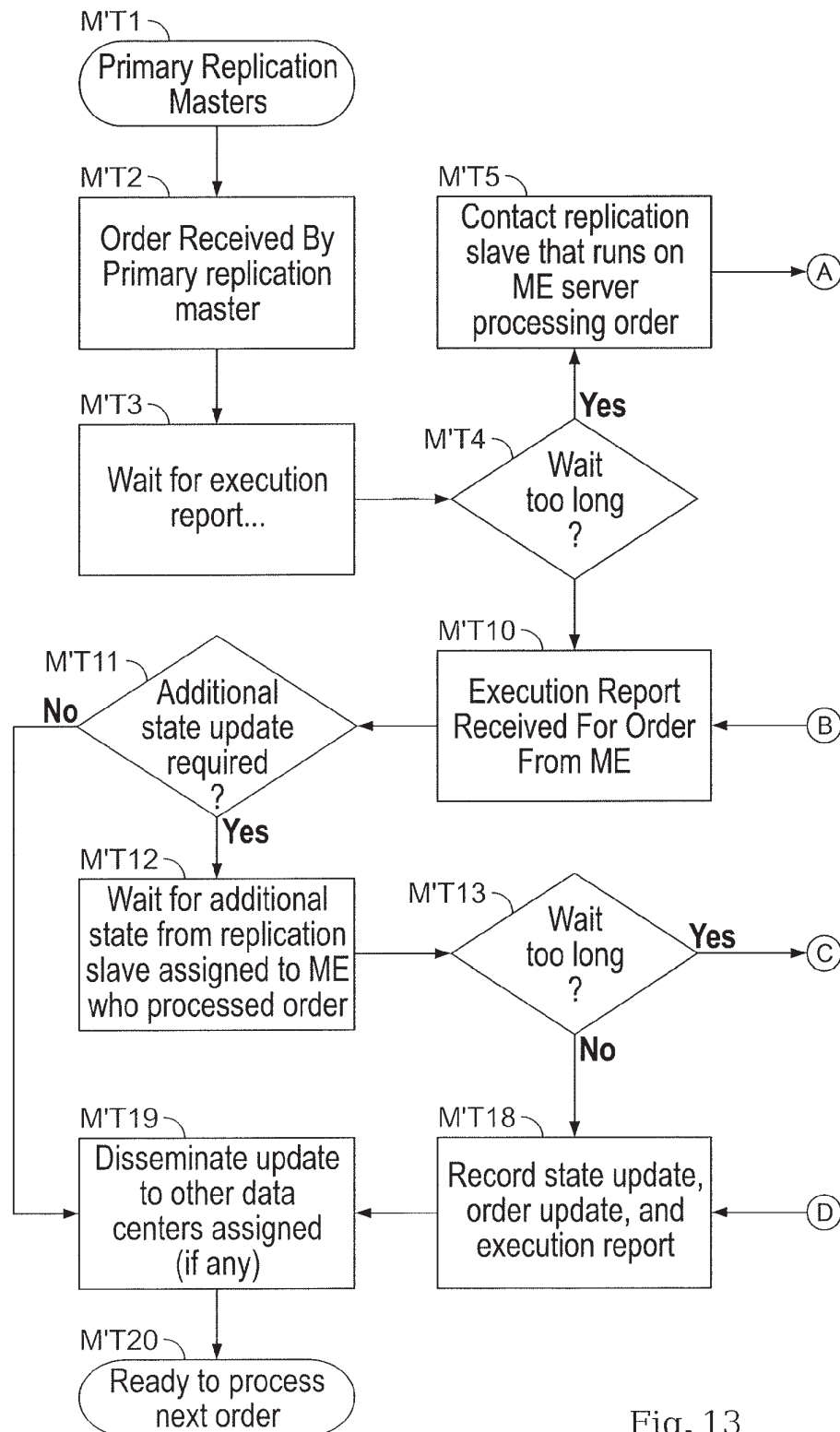


Fig. 13

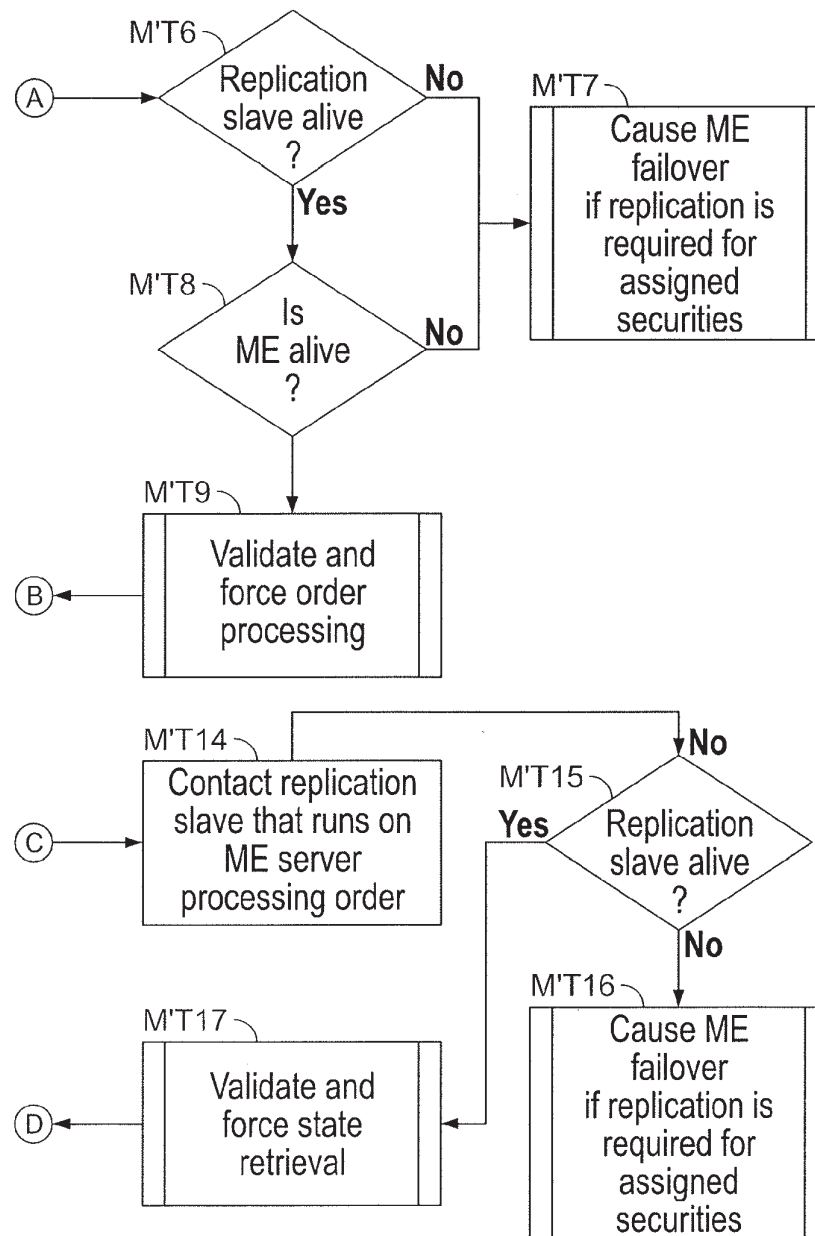
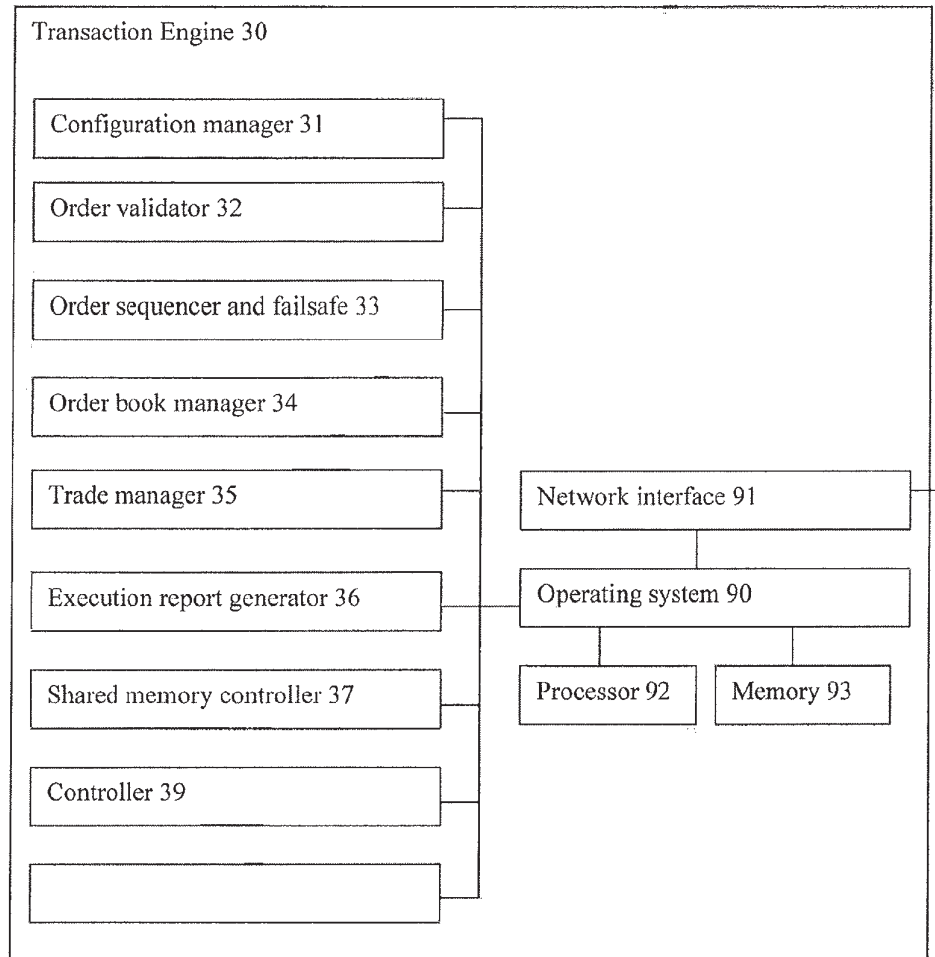


Fig. 13 (Cont.)

	Gateway (20)	Transaction Engine 1 (30)	Memory Slave Controller 1 (40)	Memory Slave Controller 2 (60)	Master (70)
Start up	Load configuration	Find management server		Receive from master the states of the master	Build topology map
	Load transaction engine mappings	Load configuration and mapping		Built topology map based on the received information	Become Primary Master
			Create shared memory map with transaction engine 1	Register with the master	Load Latest states from all masters and memory slave controllers
	Create memory map of transaction engine addresses and topic/channels (which transaction engine processes what types of orders)		Send multitask announcement (advertised) that memory slave controller 1 is ready for new orders/transactions		
Transaction processing:	Validate order	Validate order	Receive order	Order received from gateway multitask	Receive order
	Multitask order to the proper transaction engine and all memory slaves and the masters	Is order sequential? If no: go to failsafe and master supplies missing sequence	Look up last order processed in Transaction Engine 1 in the shared memory map	Look up last order processed in shared memory map	Wait for Transaction Engine to send execution report
		If yes: place order/transaction in Order Book	If order is out of sequence: contact master	Do I have this update?	If too long of a wait, then take remedial action
		Generate trade	If order is in sequence: wait for next order (no need to update shared memory because Transaction Engine already updated the shared memory map)	If no: wait for confirmation, which includes order ID, trade generated and other information	Receive Execution Report from Transaction Engine
		Send execution report on multitask channel		Write order ID into shared memory map	Disseminate update to other data centers (if any)
		Write order ID in shared memory map and update Order Book		Update Order Book	Record state update

Fig. 14

Fig. 15A



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Fig. 15B

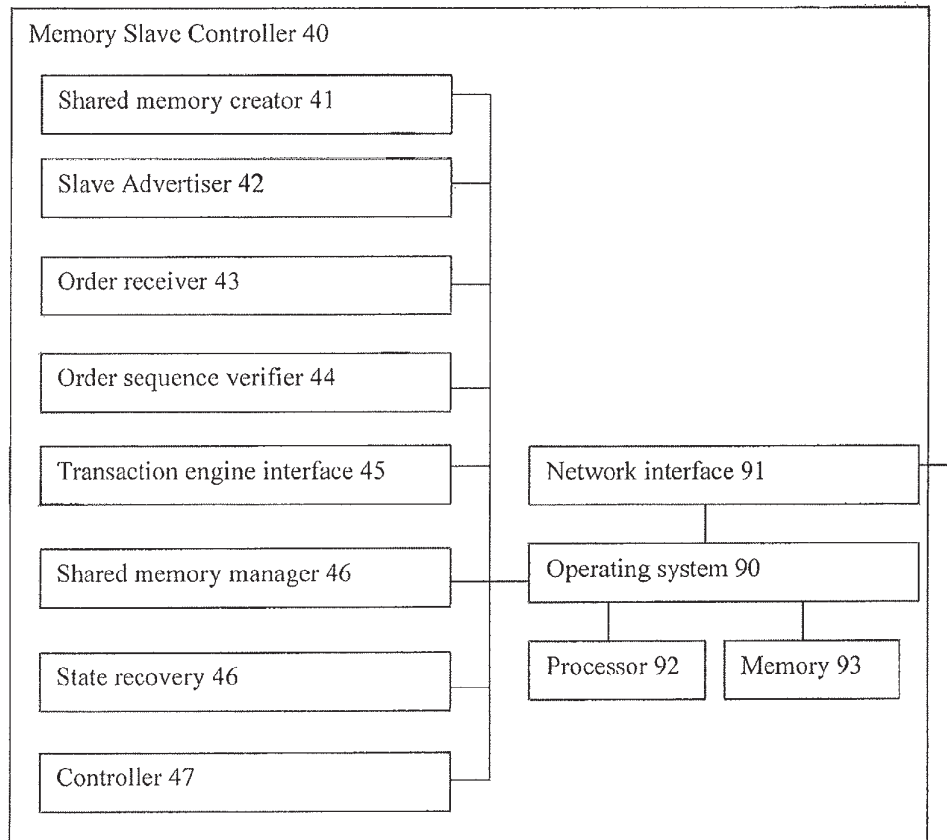


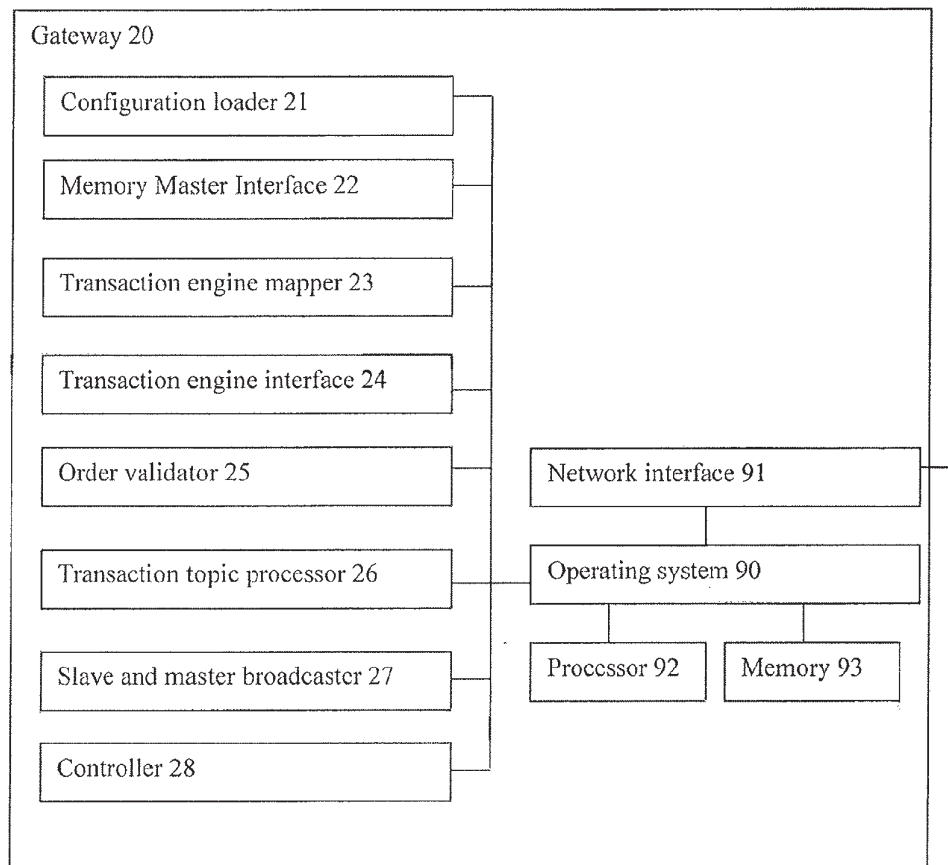
Fig. 16

Fig. 17