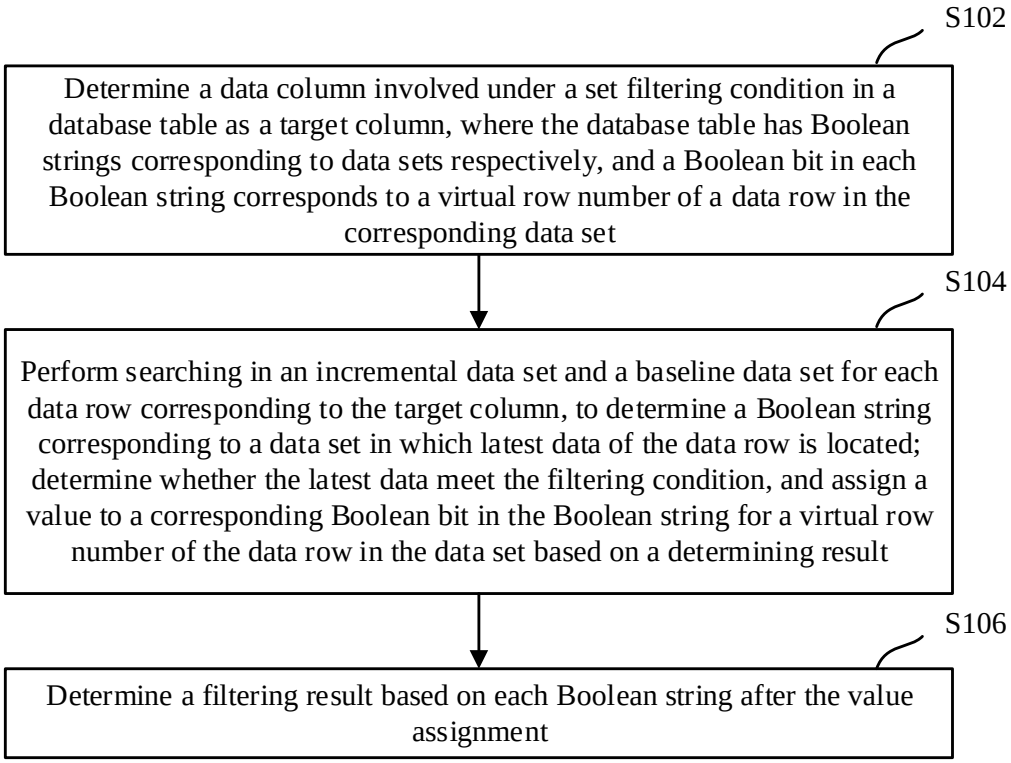

S102
Determine a data column involved under a set filtering condition in a database table as a target column, where the database table has Boolean strings corresponding to data sets respectively, and a Boolean bit in each Boolean string corresponds to a virtual row number of a data row in the corresponding data set
S104
Perform searching in an incremental data set and a baseline data set for each data row corresponding to the target column, to determine a Boolean string corresponding to a data set in which latest data of the data row is located; determine whether the latest data meet the filtering condition, and assign a value to a corresponding Boolean bit in the Boolean string for a virtual row number of the data row in the data set based on a determining result
S106
Determine a filtering result based on each Boolean string after the value assignment

FIG. 1

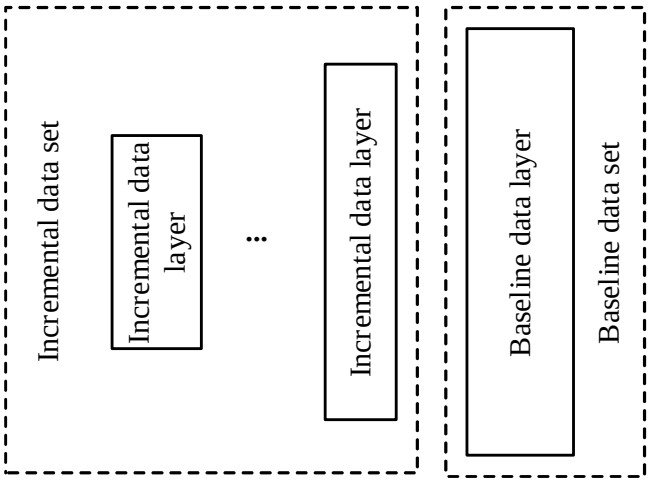

Incremental data set
Incremental data layer
Incremental data layer
Level 1
Level n-1
Level n
Baseline data layer
Baseline data set

FIG. 2a

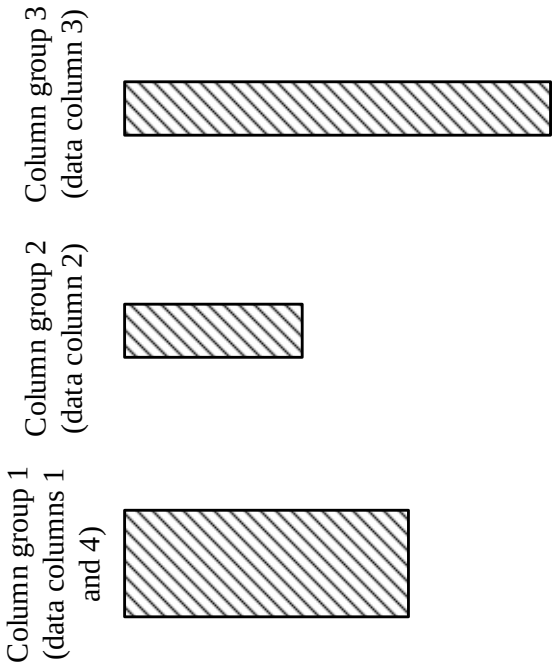

Column group 1 (data columns 1 and 4)
Column group 2 (data column 2)
Column group 3 (data column 3)

FIG. 2b

Virtual row number (baseline data set or incremental data set)	Boolean string
1	**0**
2	**1**
3	**0**
4	**1**
5	**1**
6	**0**

FIG. 3

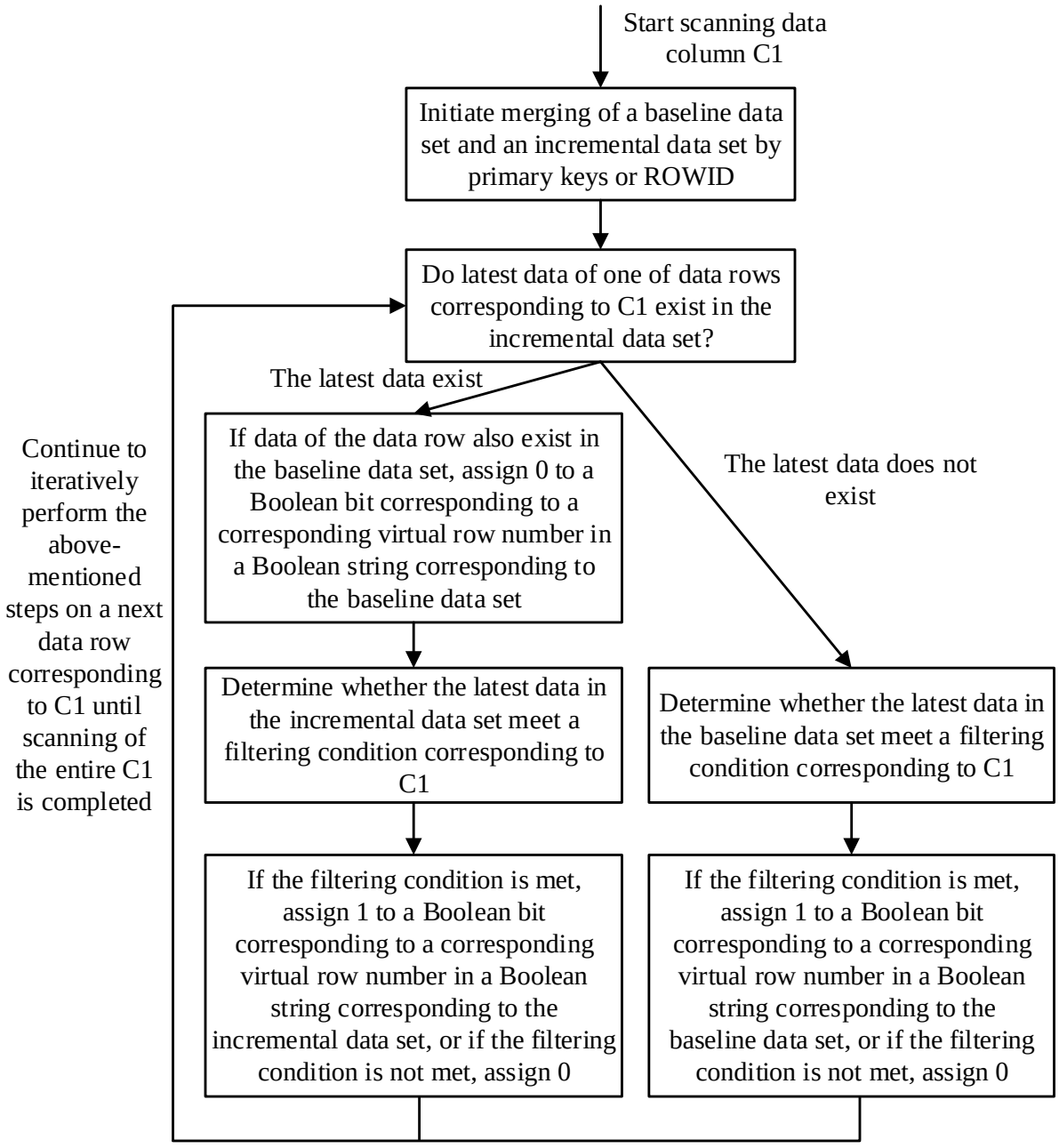

Start scanning data column C1
Initiate merging of a baseline data set and an incremental data set by primary keys or ROWID
Do latest data of one of data rows corresponding to C1 exist in the incremental data set?
The latest data exist
The latest data does not exist
If data of the data row also exist in the baseline data set, assign 0 to a Boolean bit corresponding to a corresponding virtual row number in a Boolean string corresponding to the baseline data set
Determine whether the latest data in the incremental data set meet a filtering condition corresponding to C1
Determine whether the latest data in the baseline data set meet a filtering condition corresponding to C1
If the filtering condition is met, assign 1 to a Boolean bit corresponding to a corresponding virtual row number in a Boolean string corresponding to the incremental data set, or if the filtering condition is not met, assign 0
If the filtering condition is met, assign 1 to a Boolean bit corresponding to a corresponding virtual row number in a Boolean string corresponding to the baseline data set, or if the filtering condition is not met, assign 0
Continue to iteratively perform the above-mentioned steps on a next data row corresponding to C1 until scanning of the entire C1 is completed

FIG. 4

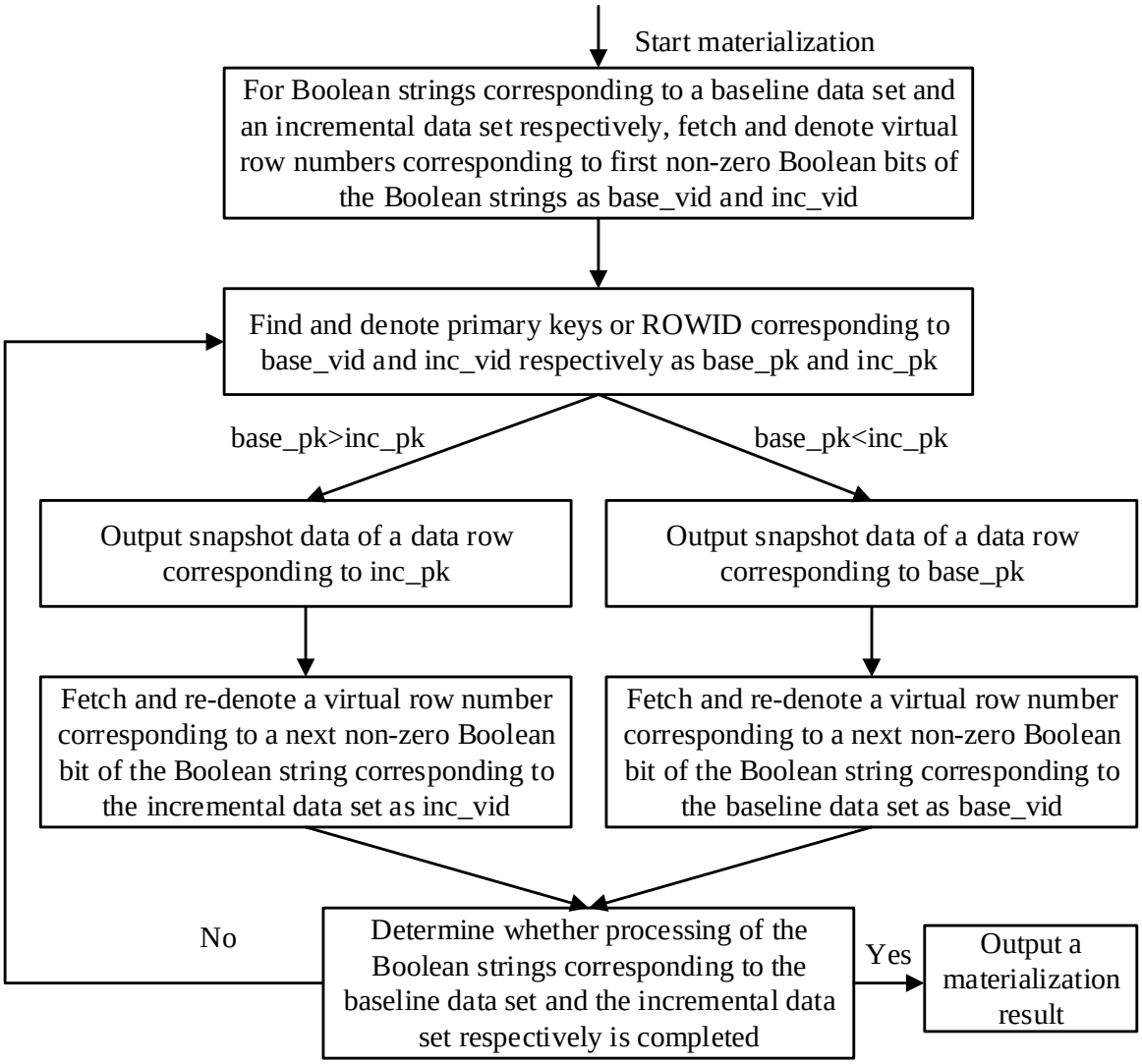

Start materialization
For Boolean strings corresponding to a baseline data set and an incremental data set respectively, fetch and denote virtual row numbers corresponding to first non-zero Boolean bits of the Boolean strings as base_vid and inc_vid
Find and denote primary keys or ROWID corresponding to base_vid and inc_vid respectively as base_pk and inc_pk
base_pk>inc_pk
base_pk<inc_pk
Output snapshot data of a data row corresponding to inc_pk
Output snapshot data of a data row corresponding to base_pk
Fetch and re-denote a virtual row number corresponding to a next non-zero Boolean bit of the Boolean string corresponding to the incremental data set as inc_vid
Fetch and re-denote a virtual row number corresponding to a next non-zero Boolean bit of the Boolean string corresponding to the baseline data set as base_vid
No
Determine whether processing of the Boolean strings corresponding to the baseline data set and the incremental data set respectively is completed
Yes
Output a materialization result

FIG. 5

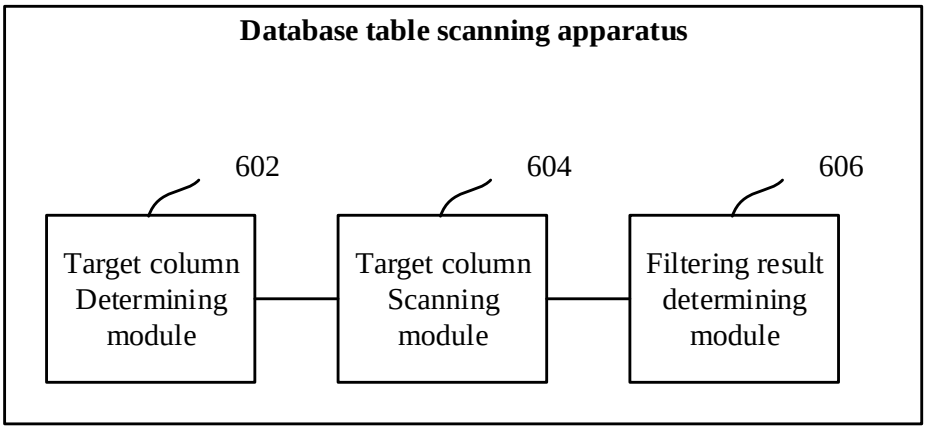

Database table scanning apparatus
602
604
606
Target column Determining module
Target column Scanning module
Filtering result determining module

FIG. 6

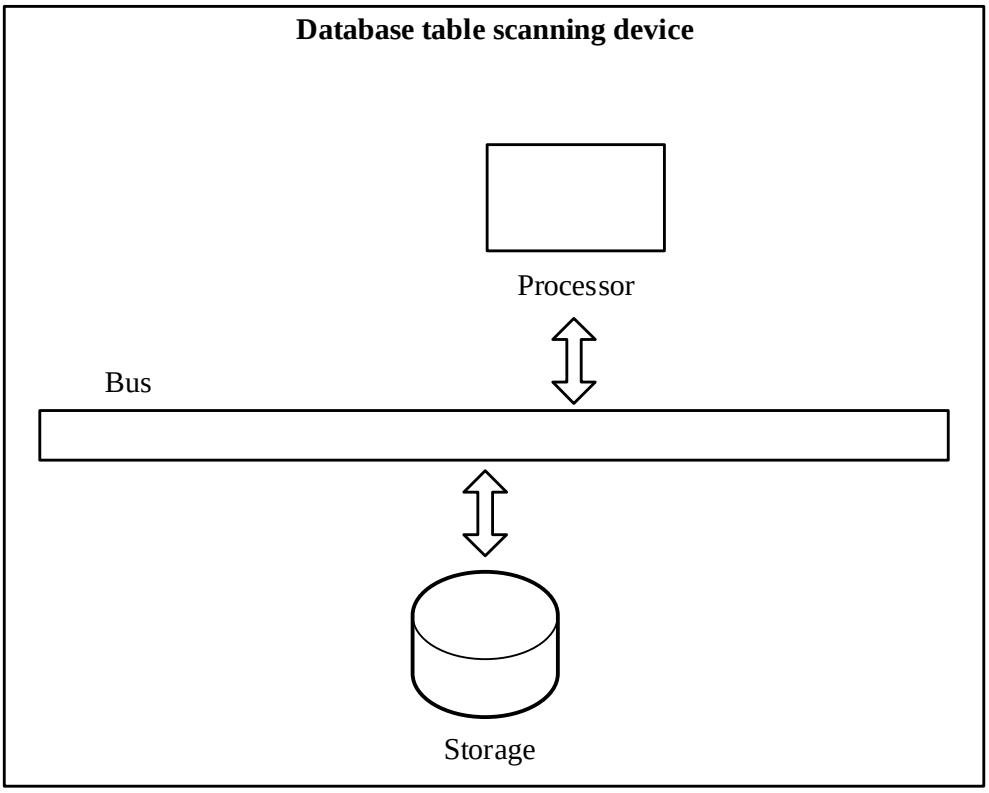

Database table scanning device
Processor
Bus
Storage

FIG. 7