FIG. 1

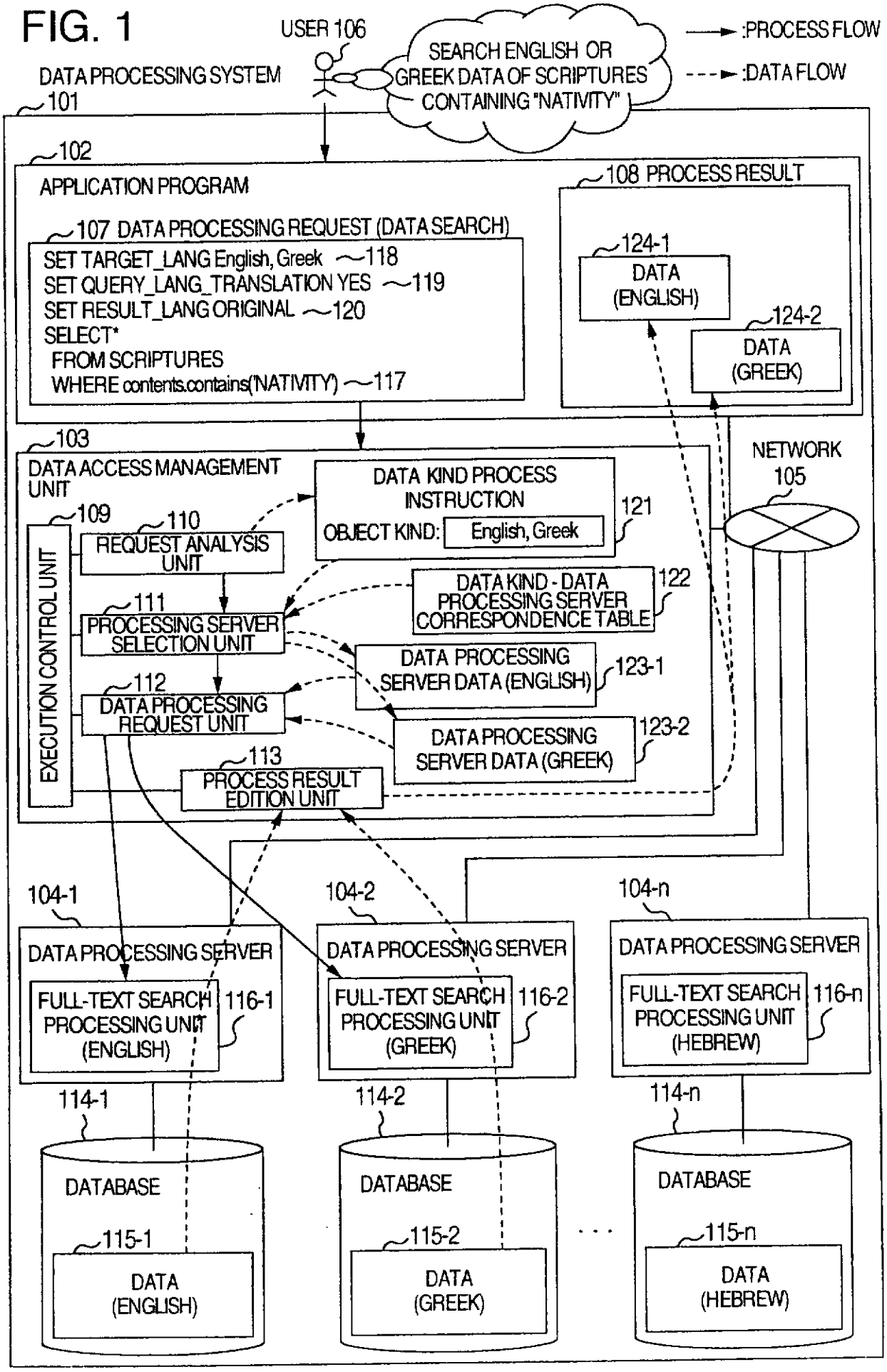

USER 106
SEARCH ENGLISH OR GREEK DATA OF SCRIPTURES CONTAINING "NATIVITY"
:PROCESS FLOW
:DATA FLOW
DATA PROCESSING SYSTEM
101
102
APPLICATION PROGRAM
107 DATA PROCESSING REQUEST (DATA SEARCH)
SET TARGET_LANG English, Greek 118
SET QUERY_LANG_TRANSLATION YES 119
SET RESULT_LANG ORIGINAL 120
SELECT*
FROM SCRIPTURES
WHERE contents.contains('NATIVITY') 117
108 PROCESS RESULT
124-1
DATA (ENGLISH)
124-2
DATA (GREEK)
103
DATA ACCESS MANAGEMENT UNIT
EXECUTION CONTROL UNIT
109
110
REQUEST ANALYSIS UNIT
111
PROCESSING SERVER SELECTION UNIT
112
DATA PROCESSING REQUEST UNIT
113
PROCESS RESULT EDITION UNIT
DATA KIND PROCESS INSTRUCTION
OBJECT KIND: English, Greek
121
DATA KIND - DATA PROCESSING SERVER CORRESPONDENCE TABLE
122
DATA PROCESSING SERVER DATA (ENGLISH)
123-1
DATA PROCESSING SERVER DATA (GREEK)
123-2
NETWORK
105
104-1
DATA PROCESSING SERVER
FULL-TEXT SEARCH PROCESSING UNIT (ENGLISH)
116-1
104-2
DATA PROCESSING SERVER
FULL-TEXT SEARCH PROCESSING UNIT (GREEK)
116-2
104-n
DATA PROCESSING SERVER
FULL-TEXT SEARCH PROCESSING UNIT (HEBREW)
116-n
114-1
DATABASE
115-1
DATA (ENGLISH)
114-2
DATABASE
115-2
DATA (GREEK)
114-n
DATABASE
115-n
DATA (HEBREW)

FIG. 2

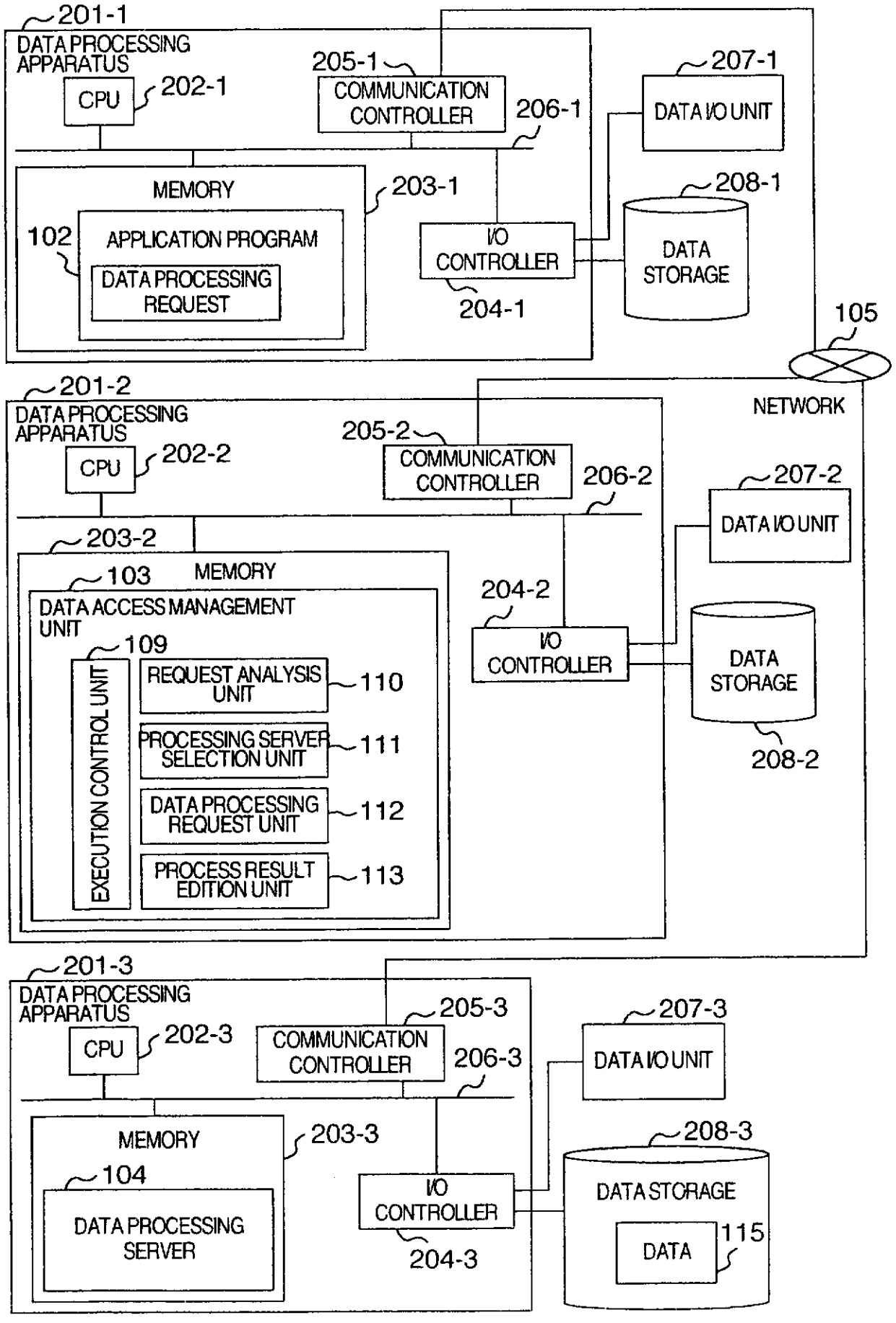

201-1
DATA PROCESSING APPARATUS
CPU
202-1
205-1
COMMUNICATION CONTROLLER
206-1
207-1
DATA I/O UNIT
MEMORY
203-1
102
APPLICATION PROGRAM
DATA PROCESSING REQUEST
I/O CONTROLLER
204-1
208-1
DATA STORAGE
105
NETWORK
201-2
DATA PROCESSING APPARATUS
CPU
202-2
205-2
COMMUNICATION CONTROLLER
206-2
207-2
DATA I/O UNIT
203-2
103
MEMORY
DATA ACCESS MANAGEMENT UNIT
109
EXECUTION CONTROL UNIT
REQUEST ANALYSIS UNIT
110
PROCESSING SERVER SELECTION UNIT
111
DATA PROCESSING REQUEST UNIT
112
PROCESS RESULT EDITION UNIT
113
204-2
I/O CONTROLLER
DATA STORAGE
208-2
201-3
DATA PROCESSING APPARATUS
CPU
202-3
205-3
COMMUNICATION CONTROLLER
206-3
207-3
DATA I/O UNIT
MEMORY
203-3
104
DATA PROCESSING SERVER
I/O CONTROLLER
204-3
208-3
DATA STORAGE
DATA
115

FIG. 3

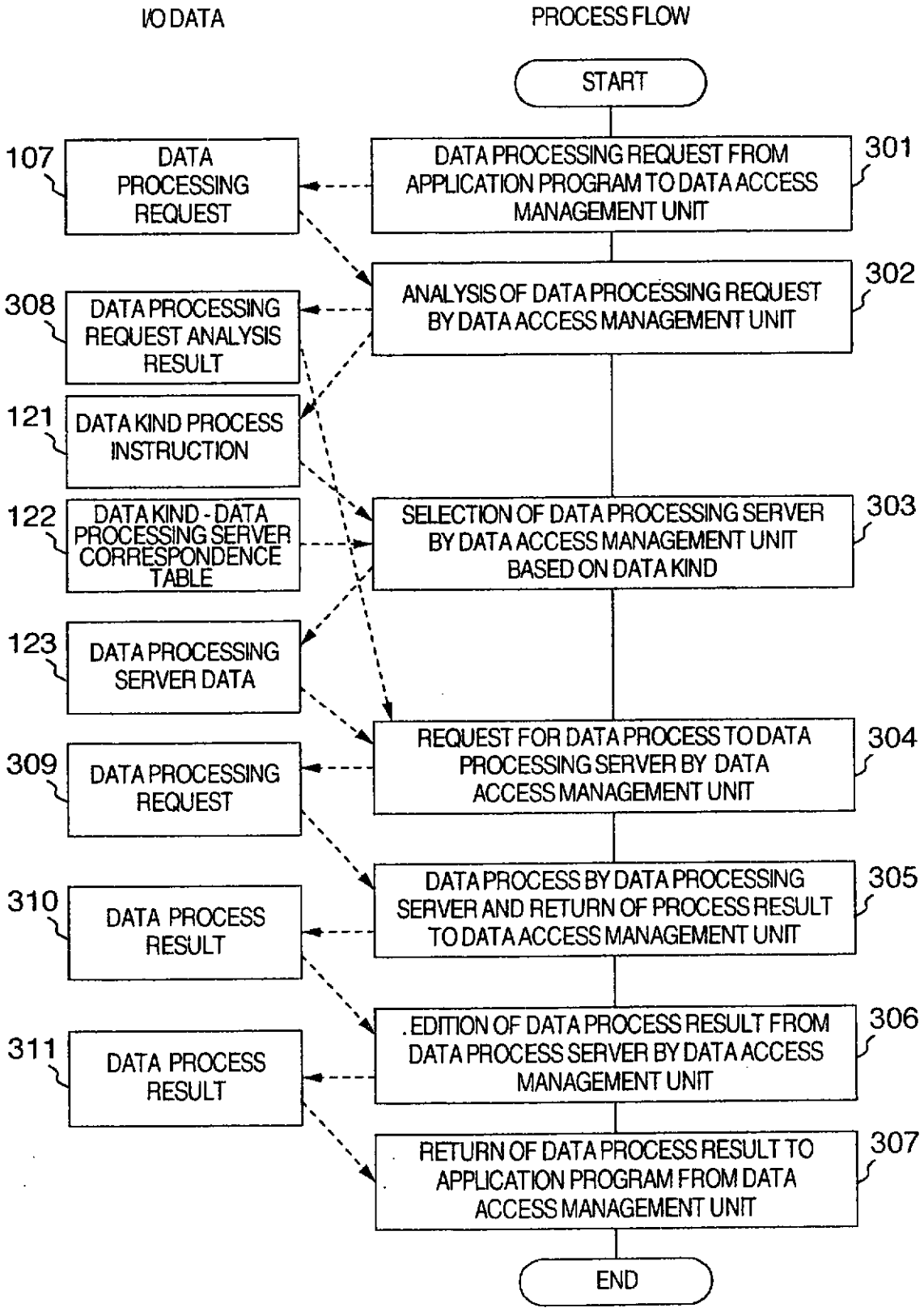

I/O DATA
PROCESS FLOW
START
107
DATA PROCESSING REQUEST
DATA PROCESSING REQUEST FROM APPLICATION PROGRAM TO DATA ACCESS MANAGEMENT UNIT
301
308
DATA PROCESSING REQUEST ANALYSIS RESULT
ANALYSIS OF DATA PROCESSING REQUEST BY DATA ACCESS MANAGEMENT UNIT
302
121
DATA KIND PROCESS INSTRUCTION
122
DATA KIND - DATA PROCESSING SERVER CORRESPONDENCE TABLE
SELECTION OF DATA PROCESSING SERVER BY DATA ACCESS MANAGEMENT UNIT BASED ON DATA KIND
303
123
DATA PROCESSING SERVER DATA
309
DATA PROCESSING REQUEST
REQUEST FOR DATA PROCESS TO DATA PROCESSING SERVER BY DATA ACCESS MANAGEMENT UNIT
304
310
DATA PROCESS RESULT
DATA PROCESS BY DATA PROCESSING SERVER AND RETURN OF PROCESS RESULT TO DATA ACCESS MANAGEMENT UNIT
305
311
DATA PROCESS RESULT
EDITION OF DATA PROCESS RESULT FROM DATA PROCESS SERVER BY DATA ACCESS MANAGEMENT UNIT
306
RETURN OF DATA PROCESS RESULT TO APPLICATION PROGRAM FROM DATA ACCESS MANAGEMENT UNIT
307
END

FIG. 4

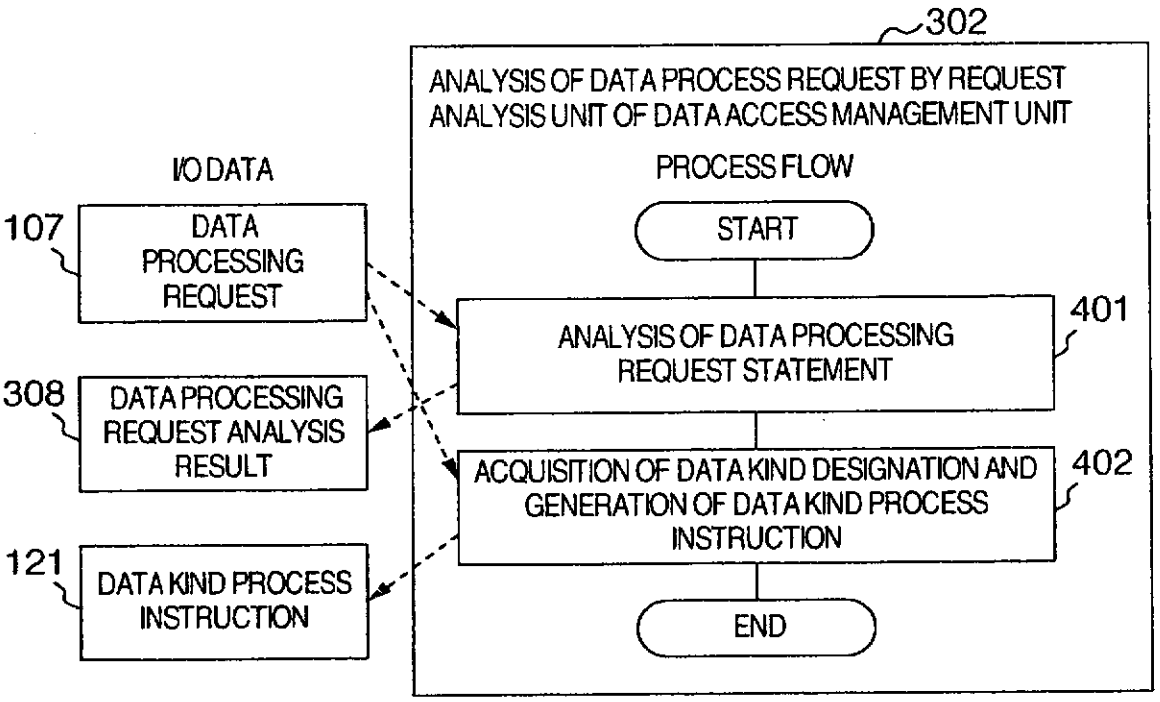

302
ANALYSIS OF DATA PROCESS REQUEST BY REQUEST ANALYSIS UNIT OF DATA ACCESS MANAGEMENT UNIT
I/O DATA
PROCESS FLOW
107
DATA PROCESSING REQUEST
START
401
ANALYSIS OF DATA PROCESSING REQUEST STATEMENT
308
DATA PROCESSING REQUEST ANALYSIS RESULT
402
ACQUISITION OF DATA KIND DESIGNATION AND GENERATION OF DATA KIND PROCESS INSTRUCTION
121
DATA KIND PROCESS INSTRUCTION
END

FIG. 5

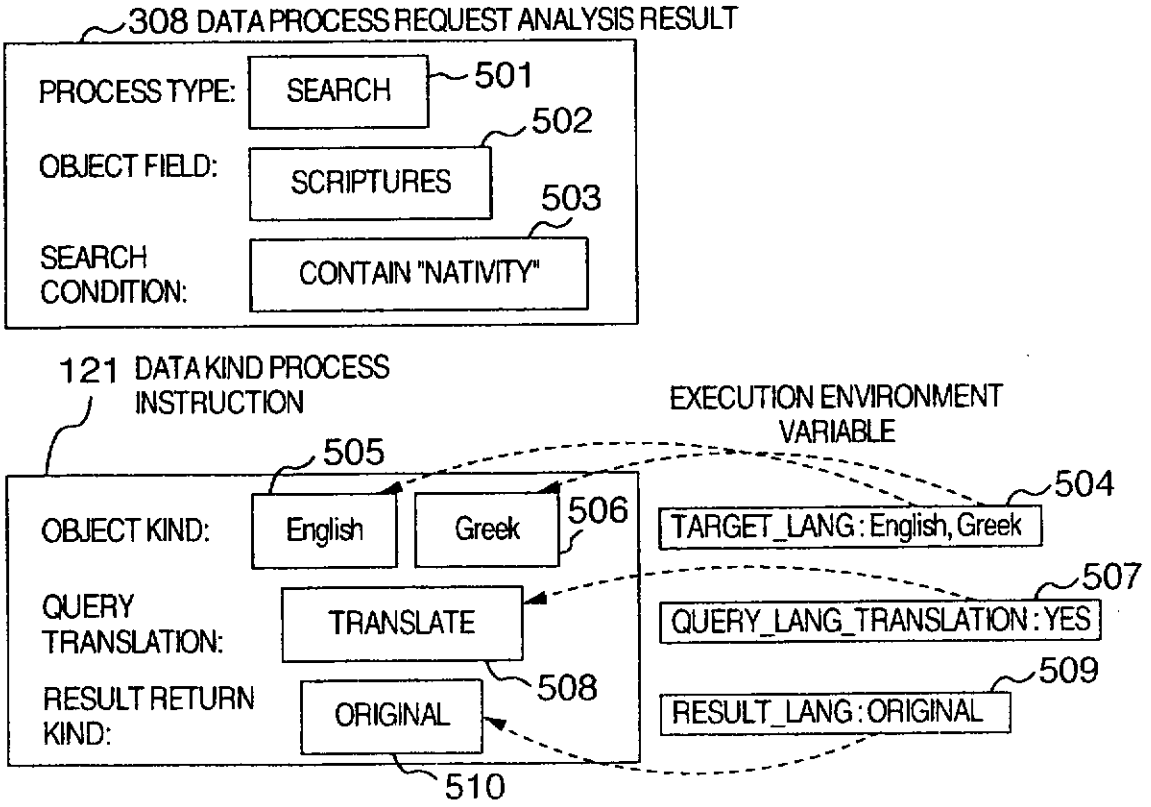

308 DATA PROCESS REQUEST ANALYSIS RESULT
PROCESS TYPE:
SEARCH
501
OBJECT FIELD:
502
SCRIPTURES
503
SEARCH CONDITION:
CONTAIN "NATIVITY"
121 DATA KIND PROCESS INSTRUCTION
EXECUTION ENVIRONMENT VARIABLE
505
OBJECT KIND:
English
Greek
506
504
TARGET_LANG : English, Greek
QUERY TRANSLATION:
TRANSLATE
507
QUERY_LANG_TRANSLATION : YES
RESULT RETURN KIND:
ORIGINAL
508
509
RESULT_LANG : ORIGINAL
510

FIG. 6

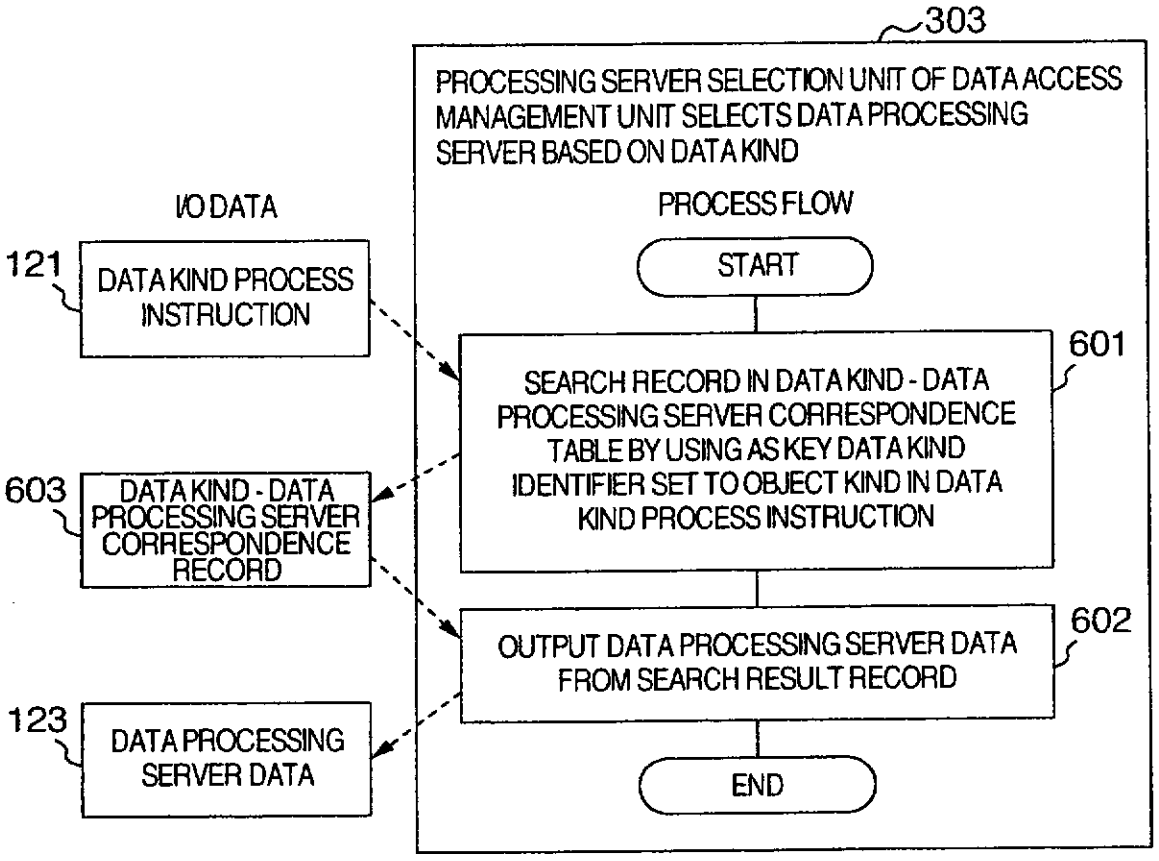


FIG. 7

122 DATA KIND - DATA PROCESSING SERVER CORRESPONDENCE TABLE

	701 DATA KIND IDENTIFIER	702 DATA PROCESSING SERVER DATA
703	English	SERVER IDENTIFIER: dbms_en PROTOCOL DATA: SQL
704	Greek	SERVER IDENTIFIER: dbms_el PROTOCOL DATA: SQL
705	Hebrew	SERVER IDENTIFIER: dbms_iw PROTOCOL DATA: SQL
	...	...

FIG. 8

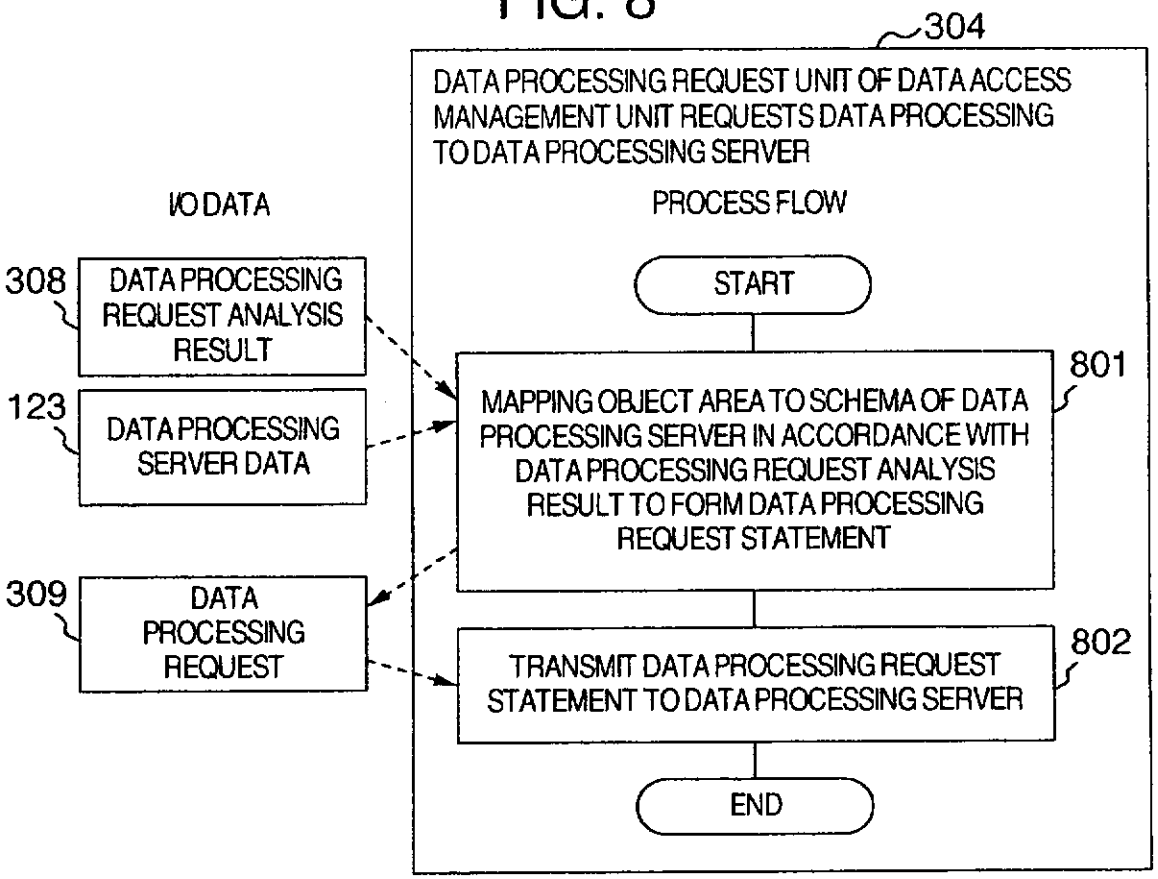

304
DATA PROCESSING REQUEST UNIT OF DATA ACCESS MANAGEMENT UNIT REQUESTS DATA PROCESSING TO DATA PROCESSING SERVER
I/O DATA
PROCESS FLOW
308
DATA PROCESSING REQUEST ANALYSIS RESULT
123
DATA PROCESSING SERVER DATA
309
DATA PROCESSING REQUEST
START
801
MAPPING OBJECT AREA TO SCHEMA OF DATA PROCESSING SERVER IN ACCORDANCE WITH DATA PROCESSING REQUEST ANALYSIS RESULT TO FORM DATA PROCESSING REQUEST STATEMENT
802
TRANSMIT DATA PROCESSING REQUEST STATEMENT TO DATA PROCESSING SERVER
END

FIG. 9

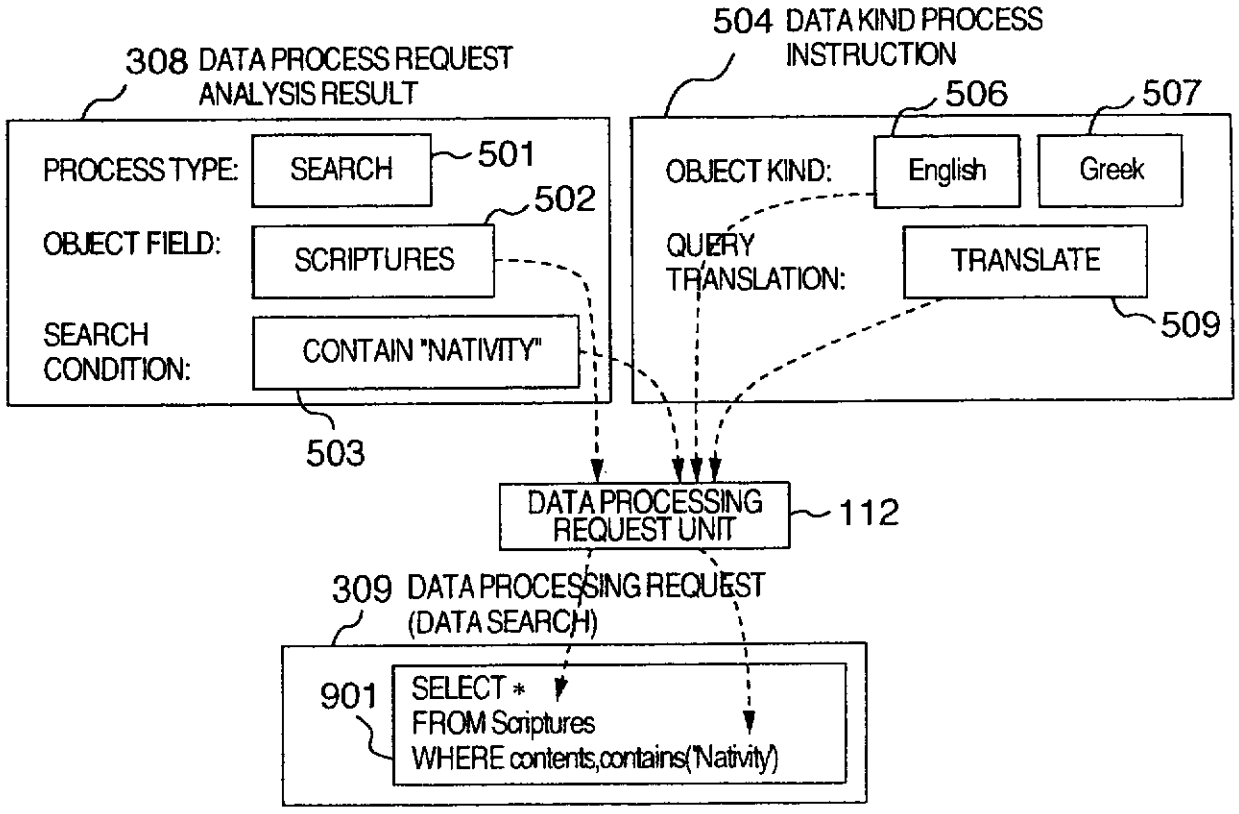

308 DATA PROCESS REQUEST ANALYSIS RESULT
PROCESS TYPE:
SEARCH
501
OBJECT FIELD:
SCRIPTURES
502
SEARCH CONDITION:
CONTAIN "NATIVITY"
503
504 DATA KIND PROCESS INSTRUCTION
506
507
OBJECT KIND:
English
Greek
QUERY TRANSLATION:
TRANSLATE
509
DATA PROCESSING REQUEST UNIT
112
309 DATA PROCESSING REQUEST (DATA SEARCH)
901
SELECT *
FROM Scriptures
WHERE contents,contains('Nativity')

FIG. 10

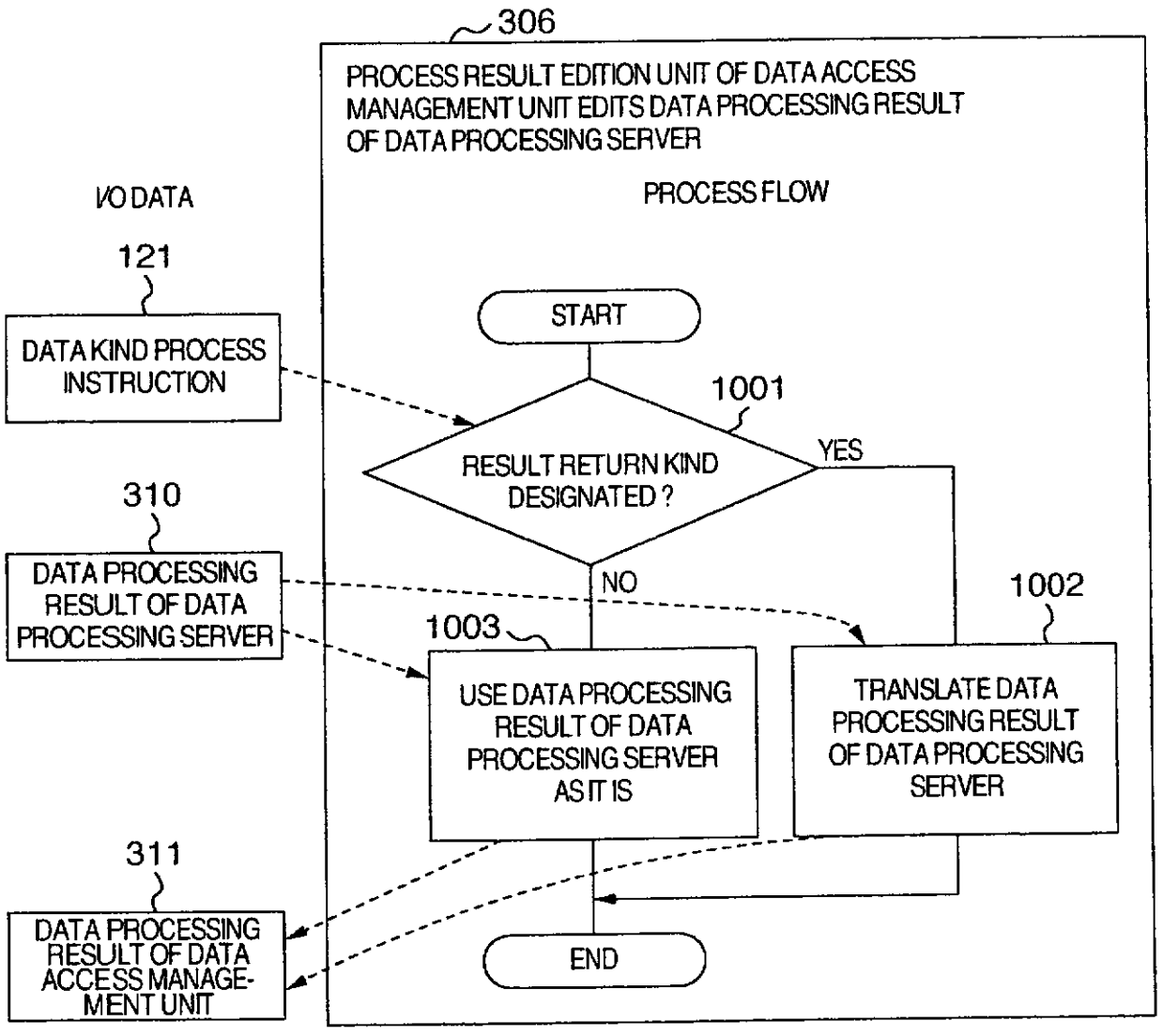

306
PROCESS RESULT EDITION UNIT OF DATA ACCESS MANAGEMENT UNIT EDITS DATA PROCESSING RESULT OF DATA PROCESSING SERVER
I/O DATA
PROCESS FLOW
121
DATA KIND PROCESS INSTRUCTION
START
1001
RESULT RETURN KIND DESIGNATED ?
YES
NO
310
DATA PROCESSING RESULT OF DATA PROCESSING SERVER
1002
1003
USE DATA PROCESSING RESULT OF DATA PROCESSING SERVER AS IT IS
TRANSLATE DATA PROCESSING RESULT OF DATA PROCESSING SERVER
311
DATA PROCESSING RESULT OF DATA ACCESS MANAGE-MENT UNIT
END

FIG. 11

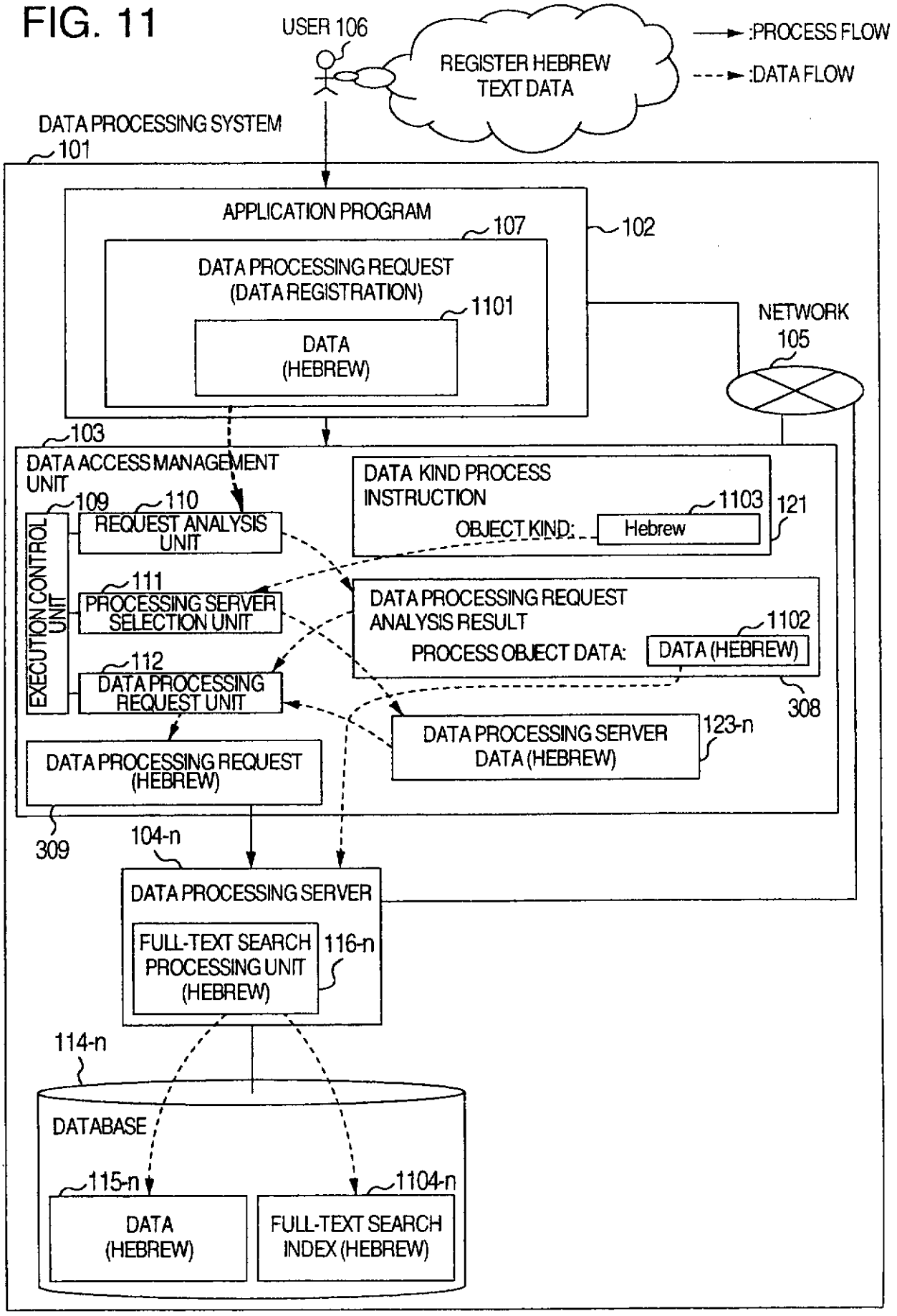

USER 106
REGISTER HEBREW TEXT DATA
:PROCESS FLOW
:DATA FLOW
DATA PROCESSING SYSTEM
101
APPLICATION PROGRAM
107
102
DATA PROCESSING REQUEST (DATA REGISTRATION)
1101
DATA (HEBREW)
NETWORK
105
103
DATA ACCESS MANAGEMENT UNIT
DATA KIND PROCESS INSTRUCTION
1103
121
OBJECT KIND:
Hebrew
109
110
REQUEST ANALYSIS UNIT
EXECUTION CONTROL UNIT
111
PROCESSING SERVER SELECTION UNIT
112
DATA PROCESSING REQUEST UNIT
DATA PROCESSING REQUEST ANALYSIS RESULT
1102
PROCESS OBJECT DATA:
DATA (HEBREW)
308
DATA PROCESSING SERVER DATA (HEBREW)
123-n
DATA PROCESSING REQUEST (HEBREW)
309
104-n
DATA PROCESSING SERVER
FULL-TEXT SEARCH PROCESSING UNIT (HEBREW)
116-n
114-n
DATABASE
115-n
1104-n
DATA (HEBREW)
FULL-TEXT SEARCH INDEX (HEBREW)

FIG. 12

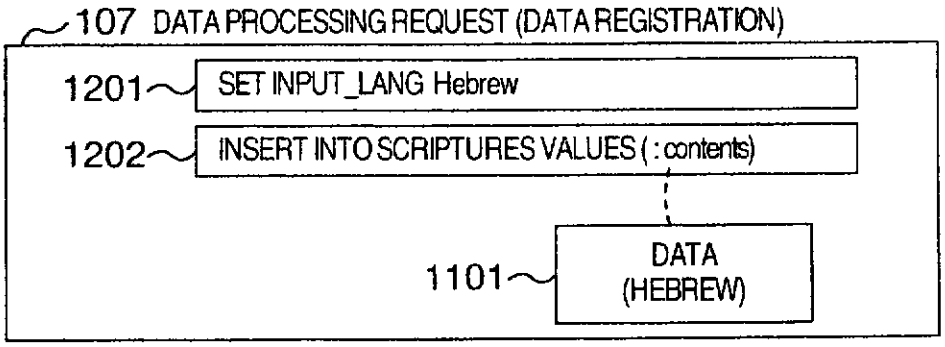


FIG. 13

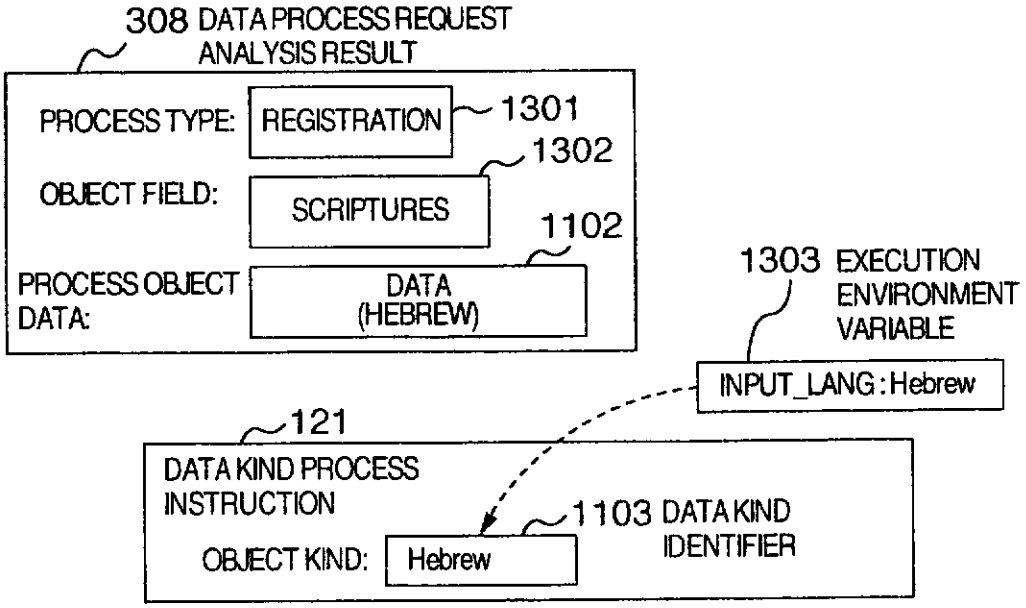
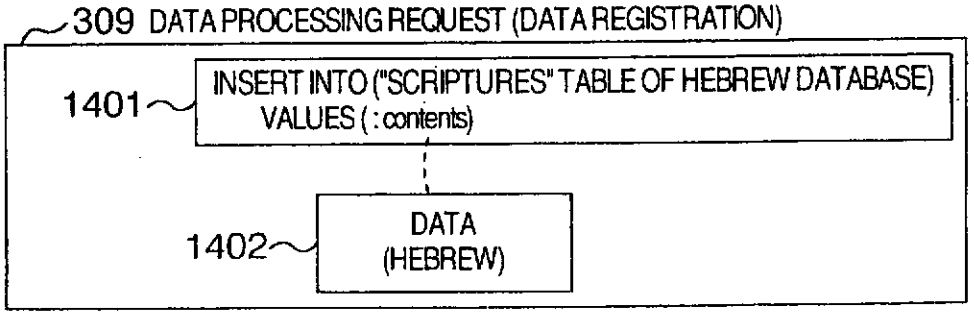


FIG. 14



30 APR 2004

FIG. 15

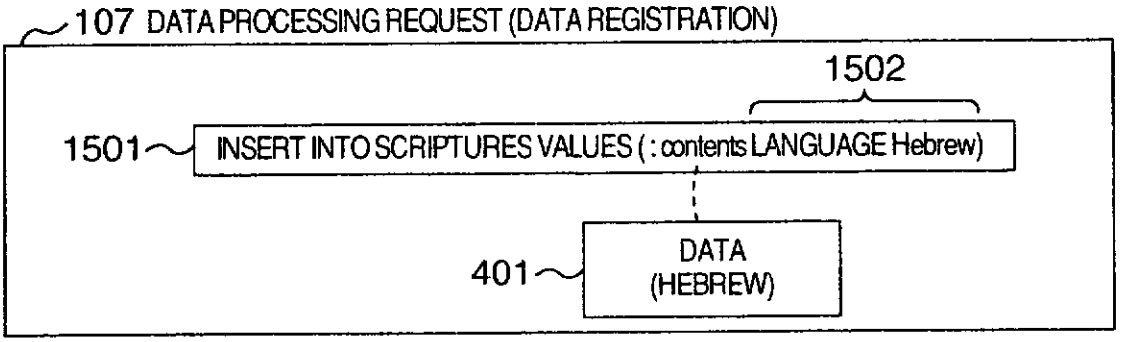


FIG. 16

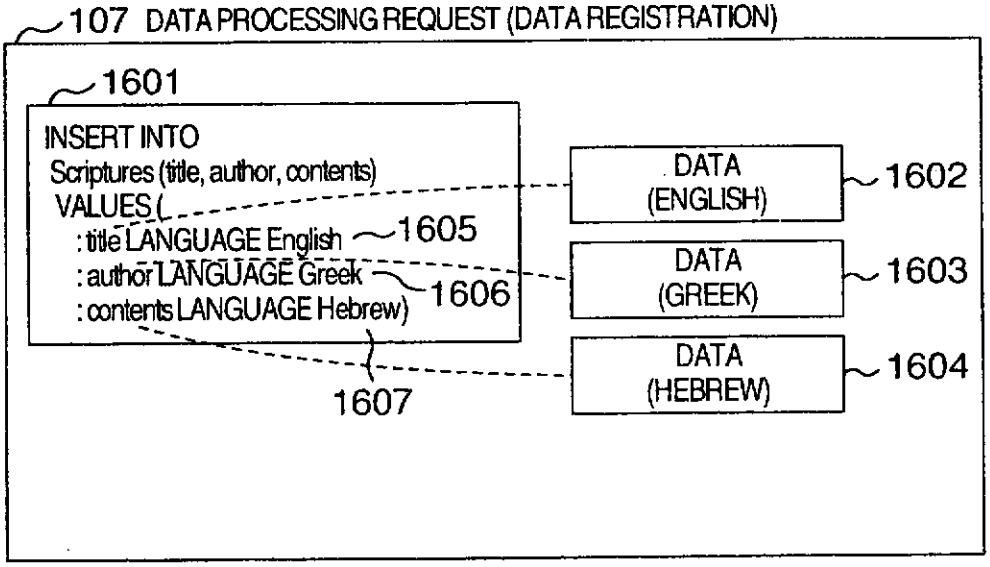


FIG. 17

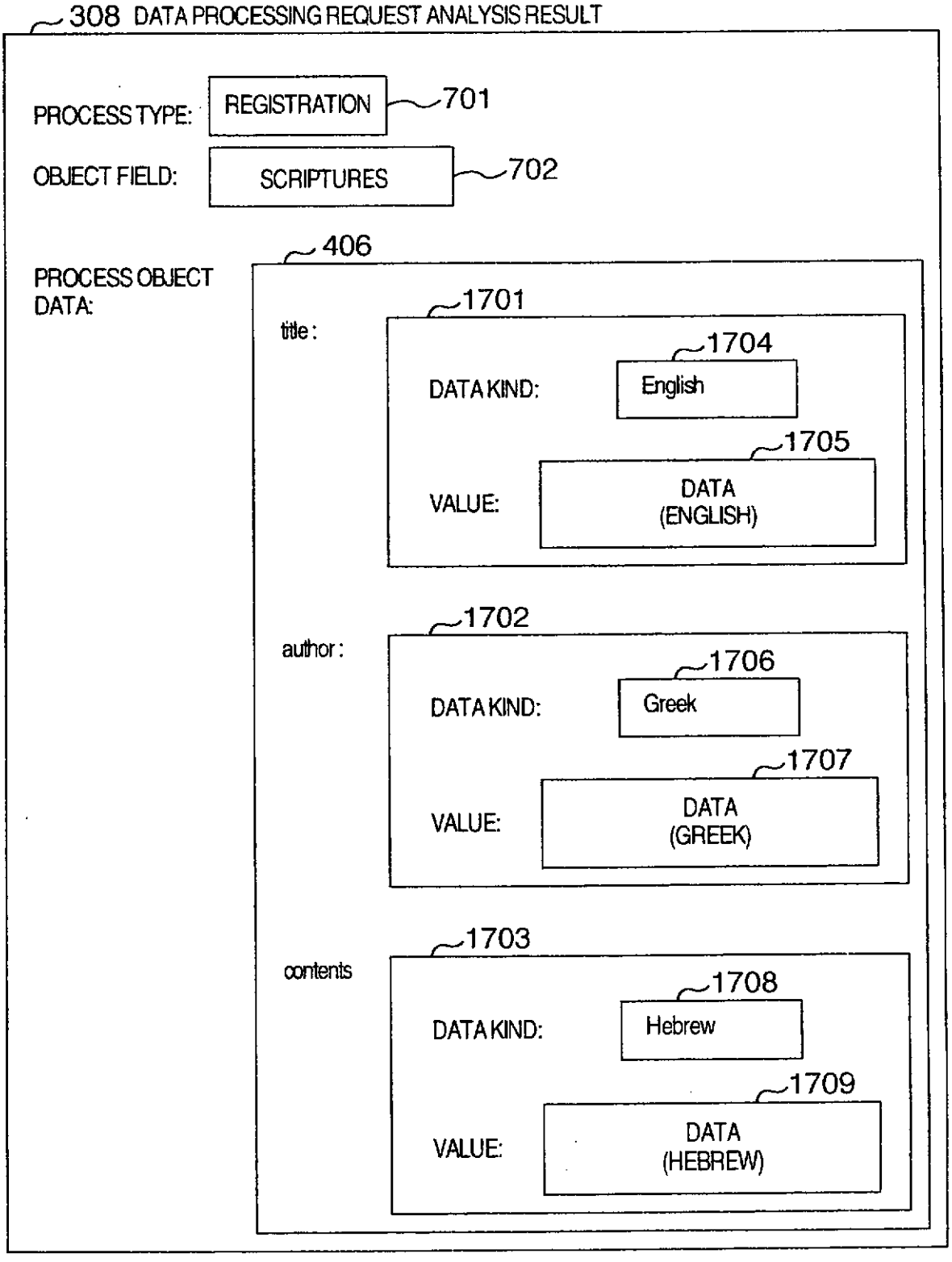

308 DATA PROCESSING REQUEST ANALYSIS RESULT
PROCESS TYPE:
REGISTRATION
701
OBJECT FIELD:
SCRIPTURES
702
406
PROCESS OBJECT DATA:
1701
title :
1704
DATA KIND:
English
1705
VALUE:
DATA (ENGLISH)
1702
author :
1706
DATA KIND:
Greek
1707
VALUE:
DATA (GREEK)
1703
contents
1708
DATA KIND:
Hebrew
1709
VALUE:
DATA (HEBREW)

FIG. 18

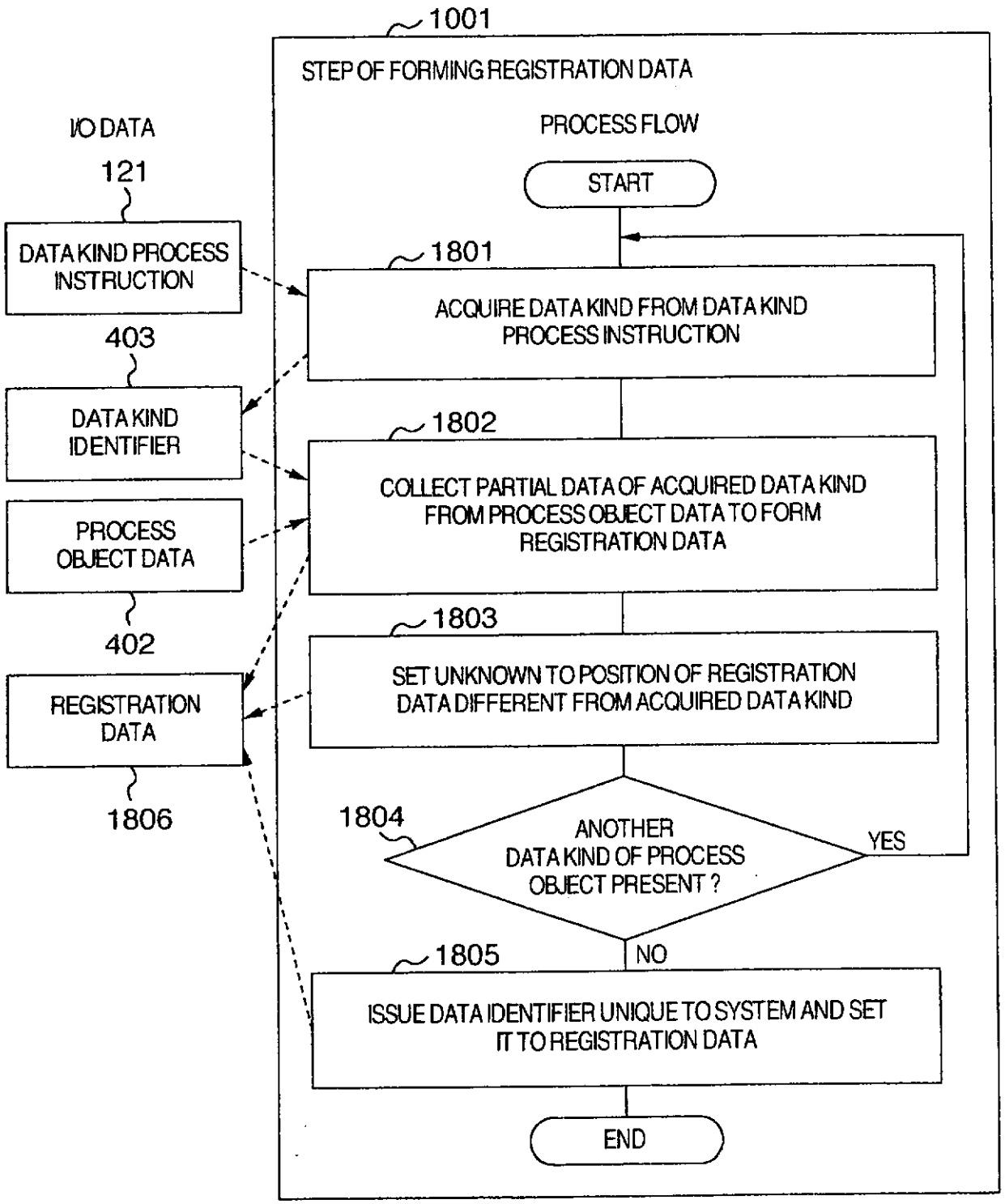

1001
STEP OF FORMING REGISTRATION DATA
I/O DATA
PROCESS FLOW
121
DATA KIND PROCESS INSTRUCTION
START
1801
ACQUIRE DATA KIND FROM DATA KIND PROCESS INSTRUCTION
403
DATA KIND IDENTIFIER
1802
COLLECT PARTIAL DATA OF ACQUIRED DATA KIND FROM PROCESS OBJECT DATA TO FORM REGISTRATION DATA
PROCESS OBJECT DATA
402
1803
SET UNKNOWN TO POSITION OF REGISTRATION DATA DIFFERENT FROM ACQUIRED DATA KIND
REGISTRATION DATA
1806
1804
ANOTHER DATA KIND OF PROCESS OBJECT PRESENT ?
YES
NO
1805
ISSUE DATA IDENTIFIER UNIQUE TO SYSTEM AND SET IT TO REGISTRATION DATA
END

FIG. 19

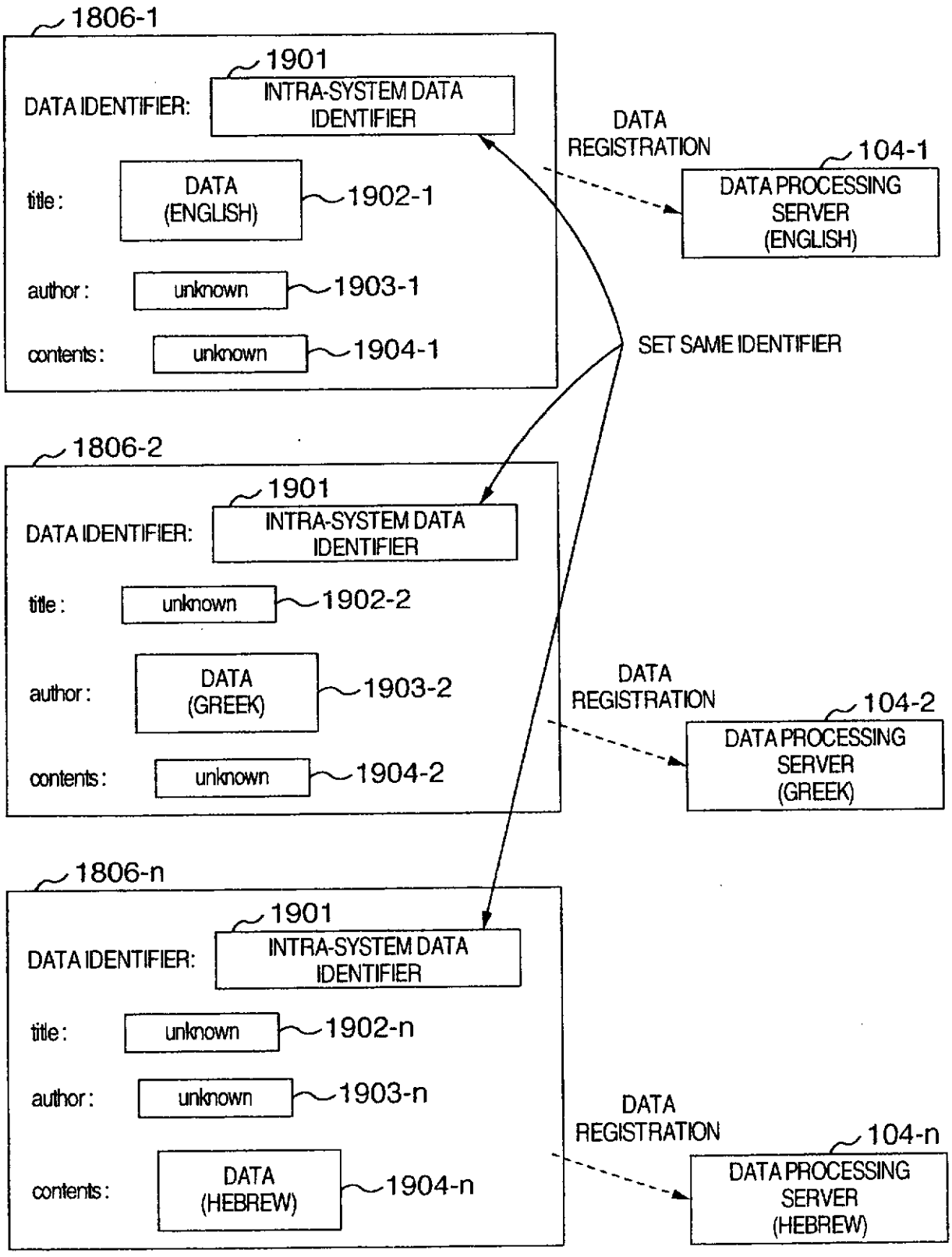

1806-1
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
title:
DATA (ENGLISH)
1902-1
author:
unknown
1903-1
contents:
unknown
1904-1
DATA REGISTRATION
104-1
DATA PROCESSING SERVER (ENGLISH)
SET SAME IDENTIFIER
1806-2
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
title:
unknown
1902-2
author:
DATA (GREEK)
1903-2
contents:
unknown
1904-2
DATA REGISTRATION
104-2
DATA PROCESSING SERVER (GREEK)
1806-n
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
title:
unknown
1902-n
author:
unknown
1903-n
contents:
DATA (HEBREW)
1904-n
DATA REGISTRATION
104-n
DATA PROCESSING SERVER (HEBREW)

FIG. 20

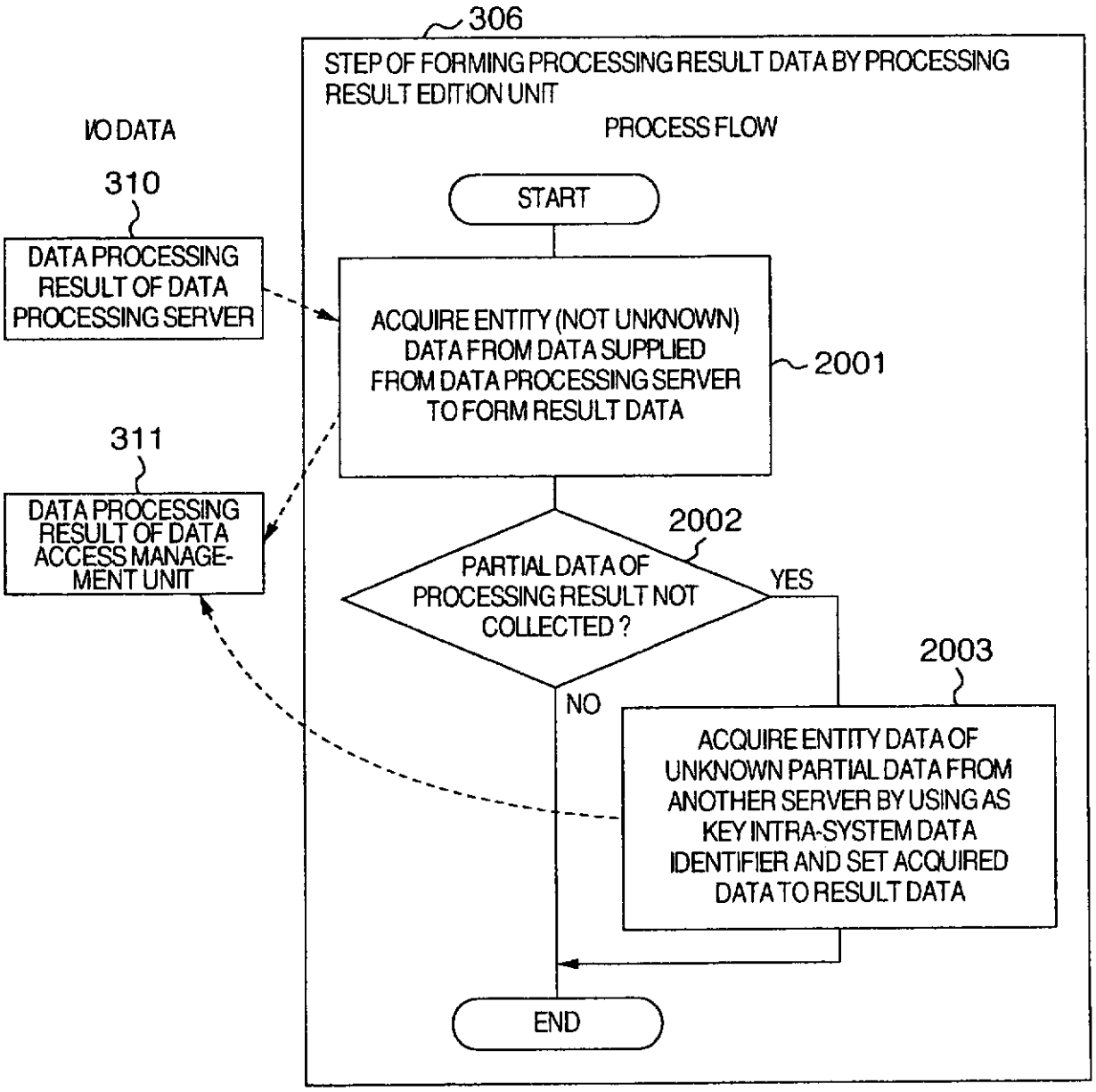

306
STEP OF FORMING PROCESSING RESULT DATA BY PROCESSING RESULT EDITION UNIT
I/O DATA
PROCESS FLOW
310
DATA PROCESSING RESULT OF DATA PROCESSING SERVER
START
ACQUIRE ENTITY (NOT UNKNOWN) DATA FROM DATA SUPPLIED FROM DATA PROCESSING SERVER TO FORM RESULT DATA
2001
311
DATA PROCESSING RESULT OF DATA ACCESS MANAGE-MENT UNIT
2002
PARTIAL DATA OF PROCESSING RESULT NOT COLLECTED ?
YES
NO
2003
ACQUIRE ENTITY DATA OF UNKNOWN PARTIAL DATA FROM ANOTHER SERVER BY USING AS KEY INTRA-SYSTEM DATA IDENTIFIER AND SET ACQUIRED DATA TO RESULT DATA
END

FIG. 21

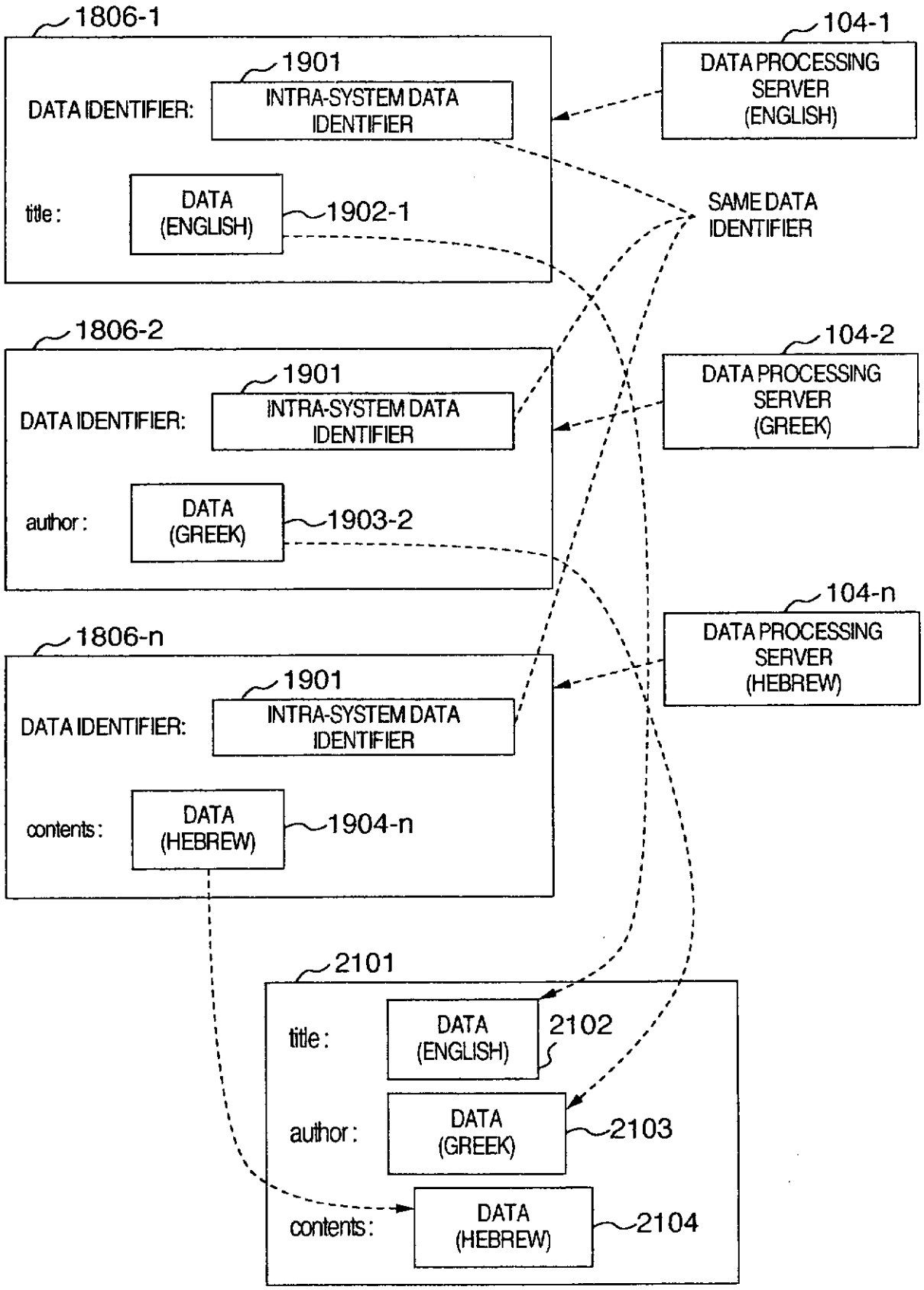

1806-1
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
title:
DATA (ENGLISH)
1902-1
104-1
DATA PROCESSING SERVER (ENGLISH)
SAME DATA IDENTIFIER
1806-2
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
author:
DATA (GREEK)
1903-2
104-2
DATA PROCESSING SERVER (GREEK)
1806-n
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
contents:
DATA (HEBREW)
1904-n
104-n
DATA PROCESSING SERVER (HEBREW)
2101
title:
DATA (ENGLISH)
2102
author:
DATA (GREEK)
2103
contents:
DATA (HEBREW)
2104

FIG. 22

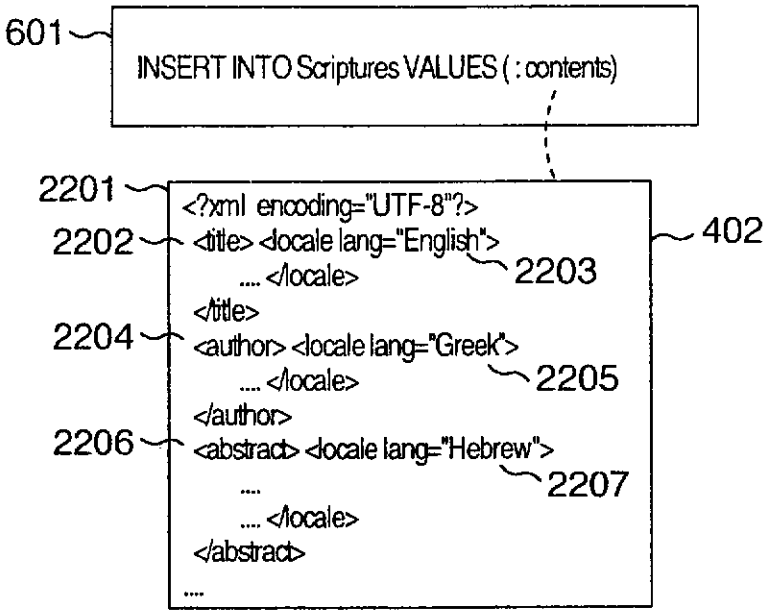


FIG. 23

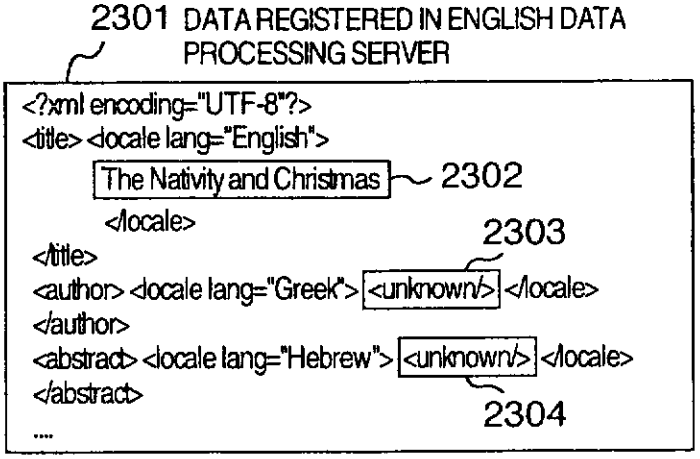


FIG. 24

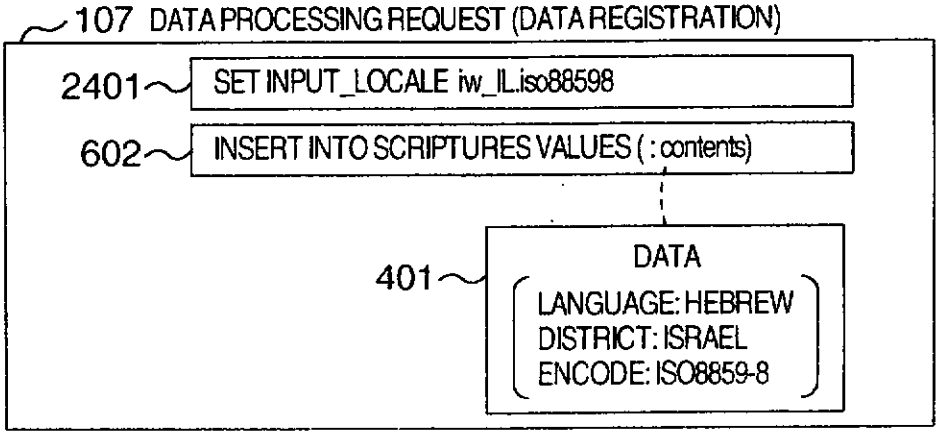


FIG. 25

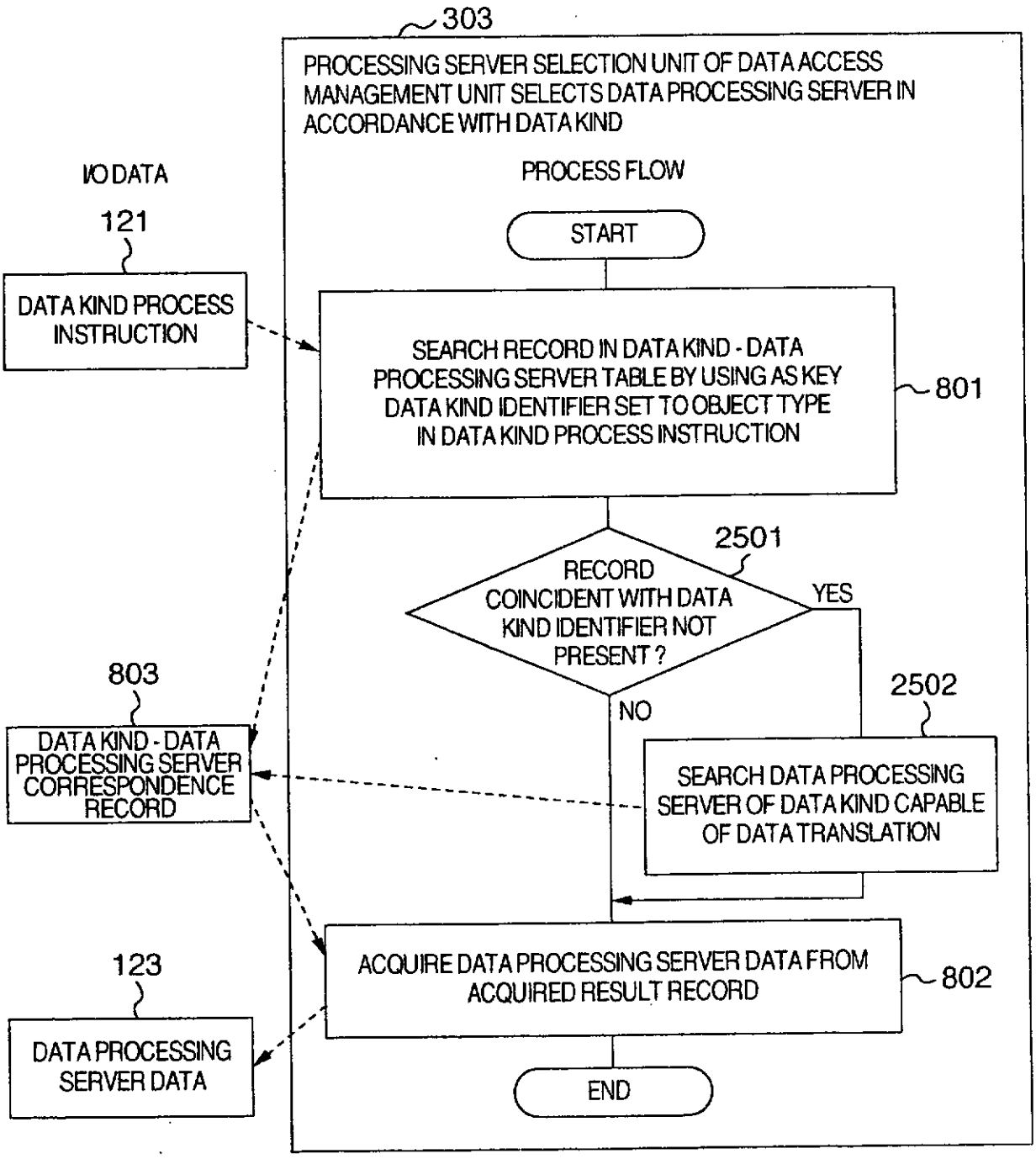

303
PROCESSING SERVER SELECTION UNIT OF DATA ACCESS MANAGEMENT UNIT SELECTS DATA PROCESSING SERVER IN ACCORDANCE WITH DATA KIND
I/O DATA
121
DATA KIND PROCESS INSTRUCTION
PROCESS FLOW
START
SEARCH RECORD IN DATA KIND - DATA PROCESSING SERVER TABLE BY USING AS KEY DATA KIND IDENTIFIER SET TO OBJECT TYPE IN DATA KIND PROCESS INSTRUCTION
801
2501
RECORD COINCIDENT WITH DATA KIND IDENTIFIER NOT PRESENT ?
YES
NO
803
DATA KIND - DATA PROCESSING SERVER CORRESPONDENCE RECORD
2502
SEARCH DATA PROCESSING SERVER OF DATA KIND CAPABLE OF DATA TRANSLATION
ACQUIRE DATA PROCESSING SERVER DATA FROM ACQUIRED RESULT RECORD
802
123
DATA PROCESSING SERVER DATA
END

FIG. 26

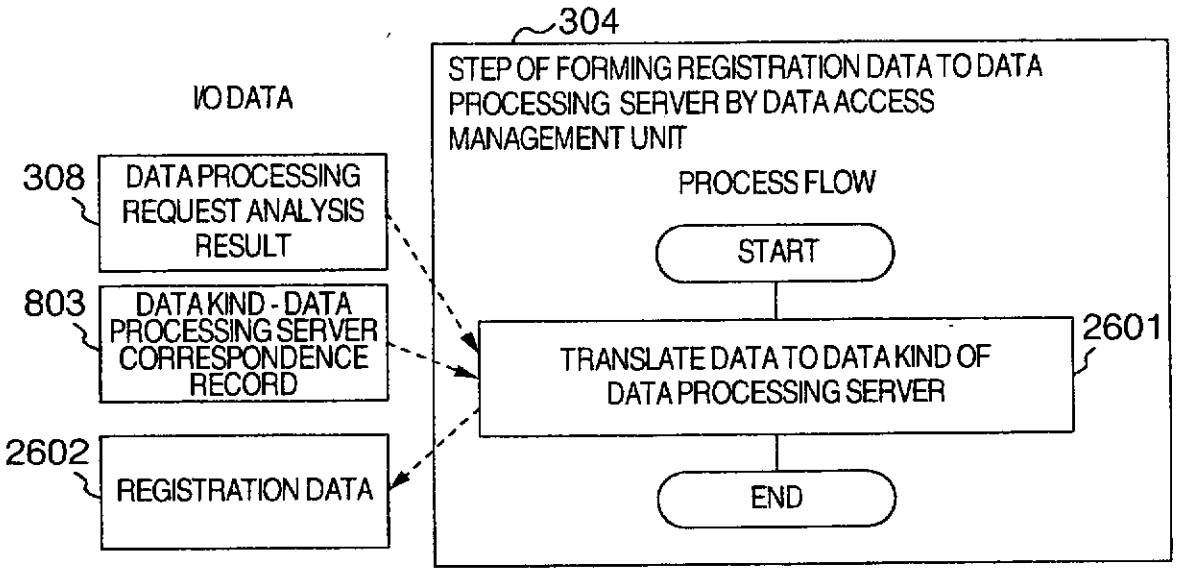


FIG. 27

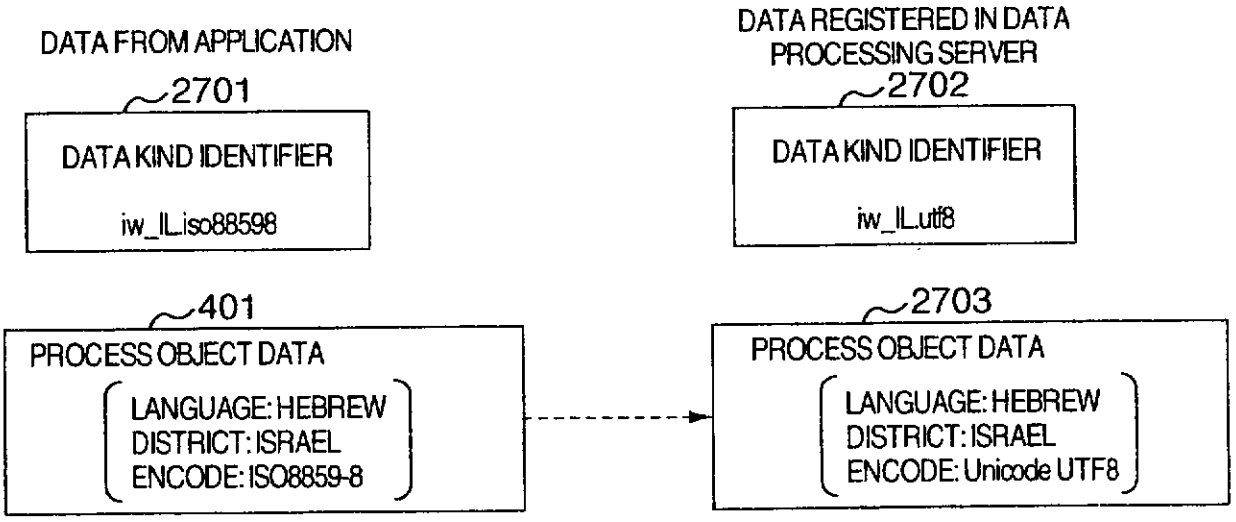


FIG. 28

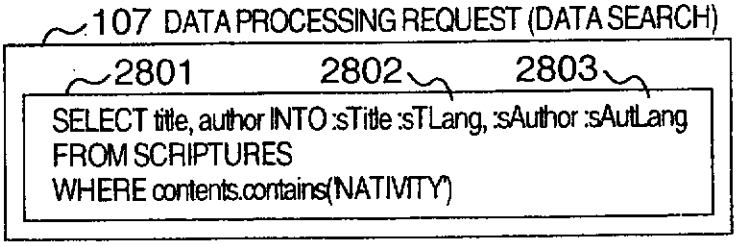


FIG. 29

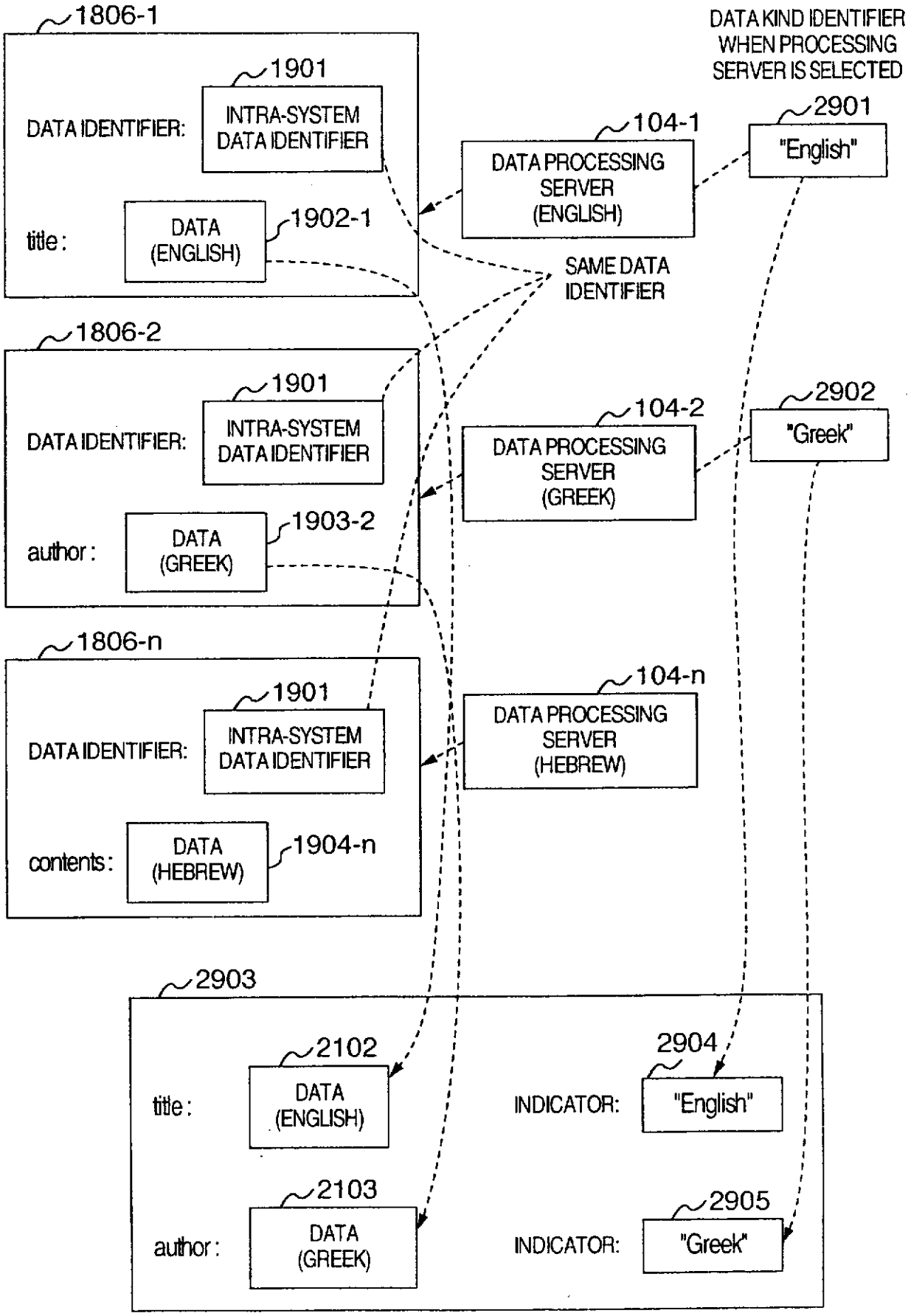

1806-1
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
title :
DATA (ENGLISH)
1902-1
DATA KIND IDENTIFIER WHEN PROCESSING SERVER IS SELECTED
2901
"English"
104-1
DATA PROCESSING SERVER (ENGLISH)
SAME DATA IDENTIFIER
1806-2
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
author :
DATA (GREEK)
1903-2
2902
"Greek"
104-2
DATA PROCESSING SERVER (GREEK)
1806-n
1901
DATA IDENTIFIER:
INTRA-SYSTEM DATA IDENTIFIER
contents :
DATA (HEBREW)
1904-n
104-n
DATA PROCESSING SERVER (HEBREW)
2903
2102
title :
DATA (ENGLISH)
2904
INDICATOR:
"English"
2103
author :
DATA (GREEK)
2905
INDICATOR:
"Greek"

FIG. 30

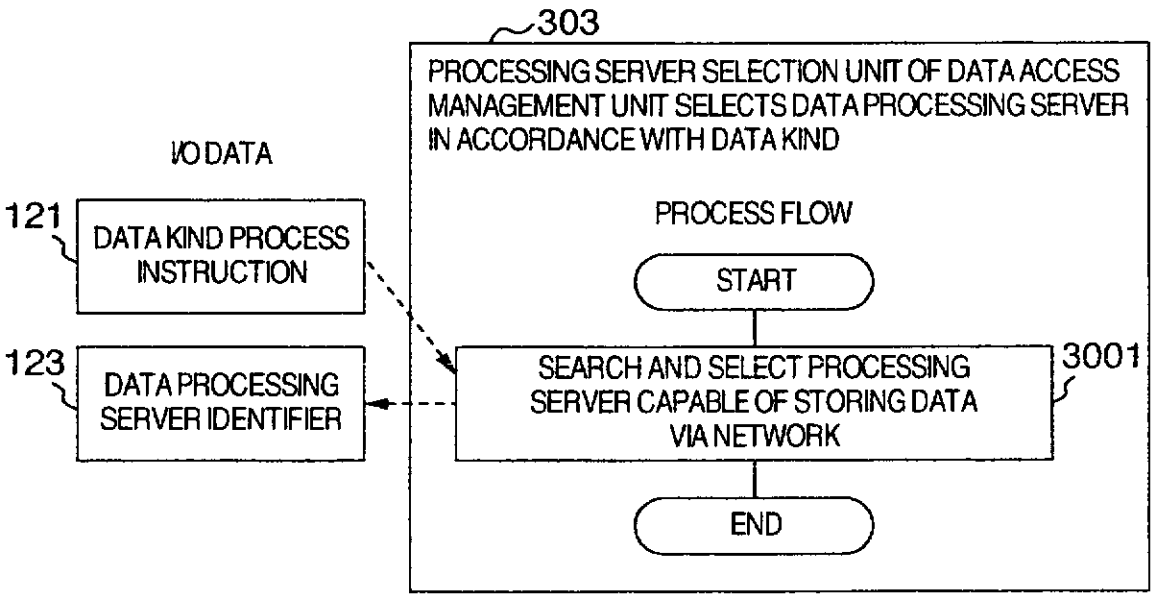

303
PROCESSING SERVER SELECTION UNIT OF DATA ACCESS MANAGEMENT UNIT SELECTS DATA PROCESSING SERVER IN ACCORDANCE WITH DATA KIND
I/O DATA
121
DATA KIND PROCESS INSTRUCTION
123
DATA PROCESSING SERVER IDENTIFIER
PROCESS FLOW
START
SEARCH AND SELECT PROCESSING SERVER CAPABLE OF STORING DATA VIA NETWORK
3001
END

FIG. 31

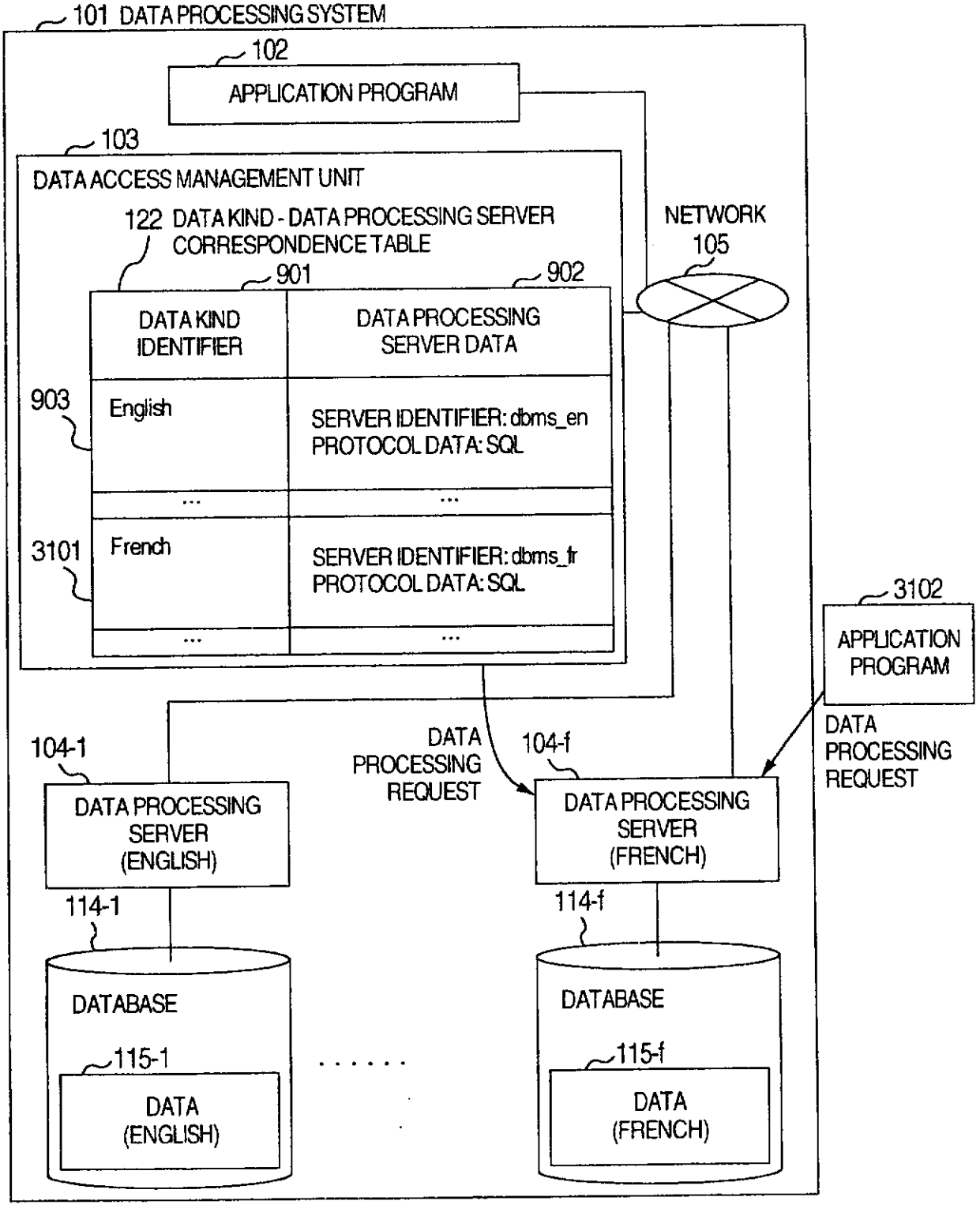

101 DATA PROCESSING SYSTEM
102
APPLICATION PROGRAM
103
DATA ACCESS MANAGEMENT UNIT
122 DATA KIND - DATA PROCESSING SERVER CORRESPONDENCE TABLE
NETWORK
105
901
902
DATA KIND IDENTIFIER
DATA PROCESSING SERVER DATA
903
English
SERVER IDENTIFIER: dbms_en
PROTOCOL DATA: SQL
...
3101
French
SERVER IDENTIFIER: dbms_fr
PROTOCOL DATA: SQL
3102
APPLICATION PROGRAM
DATA PROCESSING REQUEST
104-1
DATA PROCESSING REQUEST
104-f
DATA PROCESSING SERVER (ENGLISH)
DATA PROCESSING SERVER (FRENCH)
114-1
114-f
DATABASE
DATABASE
115-1
115-f
DATA (ENGLISH)
DATA (FRENCH)

FIG. 32

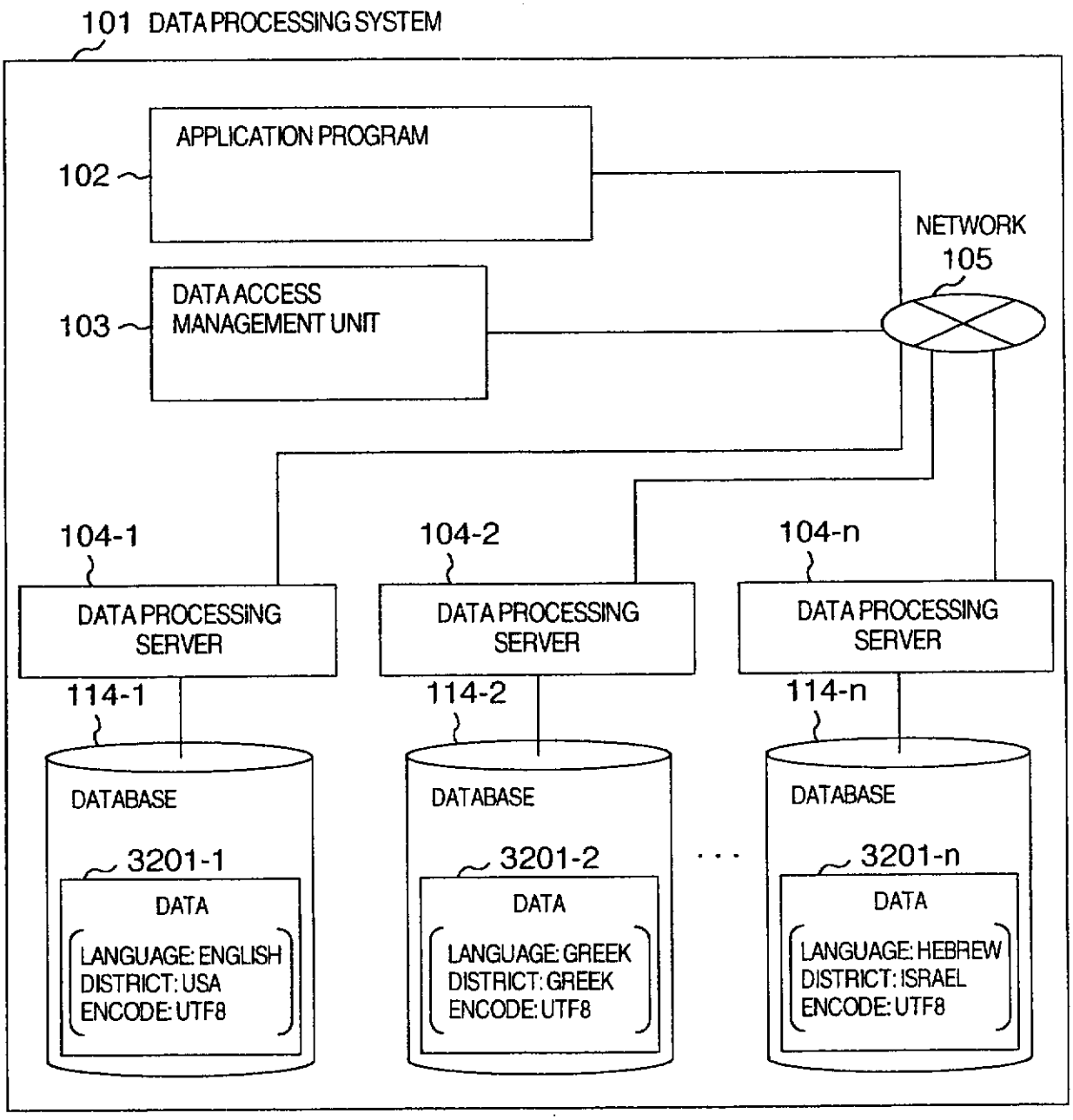

101 DATA PROCESSING SYSTEM
APPLICATION PROGRAM
102
DATA ACCESS MANAGEMENT UNIT
103
NETWORK
105
104-1
104-2
104-n
DATA PROCESSING SERVER
DATA PROCESSING SERVER
DATA PROCESSING SERVER
114-1
114-2
114-n
DATABASE
DATABASE
DATABASE
3201-1
3201-2
3201-n
DATA
LANGUAGE: ENGLISH
DISTRICT: USA
ENCODE: UTF8
DATA
LANGUAGE: GREEK
DISTRICT: GREEK
ENCODE: UTF8
DATA
LANGUAGE: HEBREW
DISTRICT: ISRAEL
ENCODE: UTF8

FIG. 33

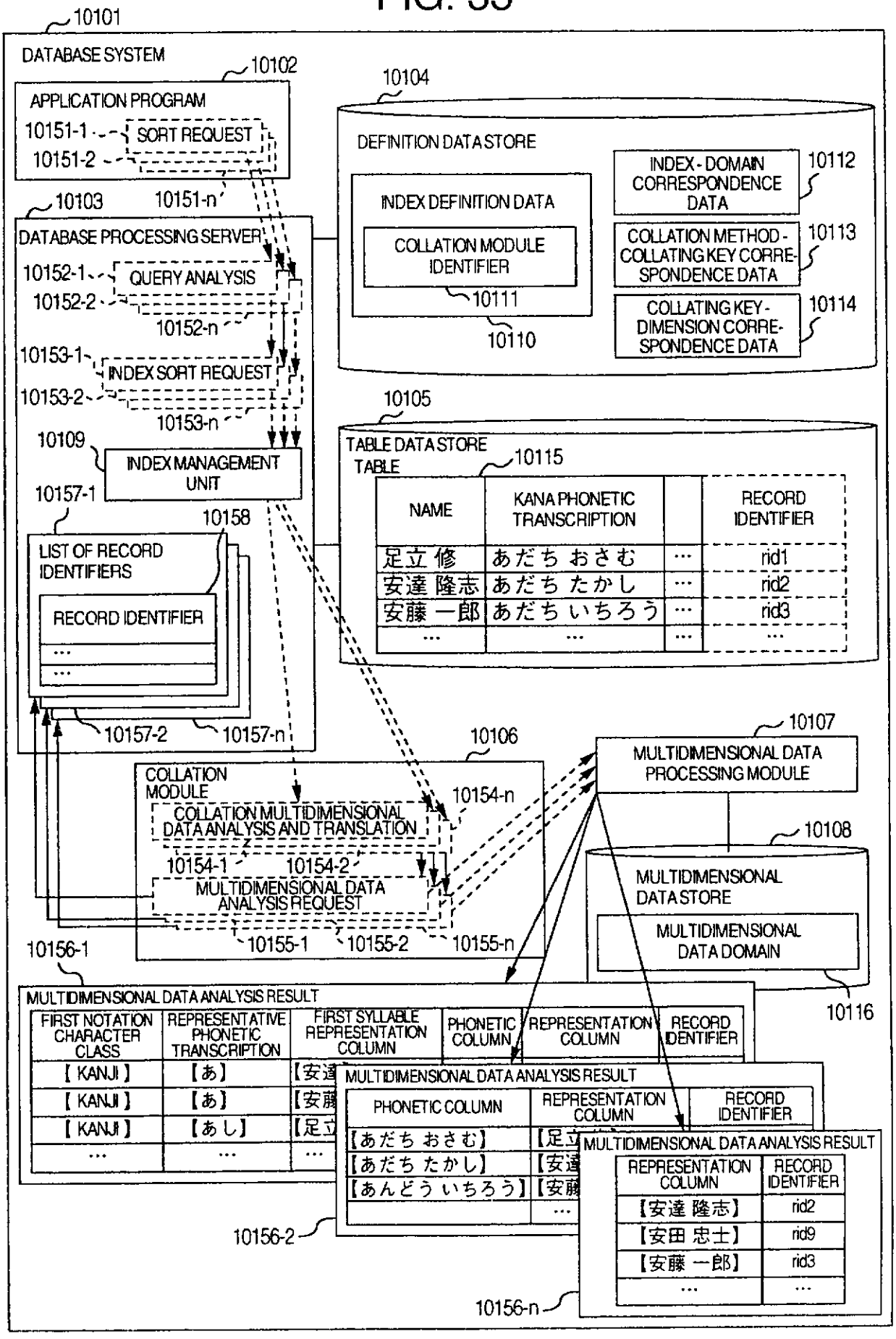

10101
DATABASE SYSTEM
10102
APPLICATION PROGRAM
10151-1
SORT REQUEST
10151-2
10151-n
10103
DATABASE PROCESSING SERVER
10152-1
QUERY ANALYSIS
10152-2
10152-n
10153-1
INDEX SORT REQUEST
10153-2
10153-n
10109
INDEX MANAGEMENT UNIT
10157-1
10158
LIST OF RECORD IDENTIFIERS
RECORD IDENTIFIER
10157-2
10157-n
10104
DEFINITION DATA STORE
INDEX DEFINITION DATA
COLLATION MODULE IDENTIFIER
10111
10110
INDEX - DOMAIN CORRESPONDENCE DATA
10112
COLLATION METHOD - COLLATING KEY CORRESPONDENCE DATA
10113
COLLATING KEY - DIMENSION CORRESPONDENCE DATA
10114
10105
TABLE DATA STORE
TABLE
10115
NAME
KANA PHONETIC TRANSCRIPTION
RECORD IDENTIFIER
足立 修
あだち おさむ
rid1
安達 隆志
あだち たかし
rid2
安藤 一郎
あだち いちろう
rid3
10106
COLLATION MODULE
COLLATION MULTIDIMENSIONAL DATA ANALYSIS AND TRANSLATION
10154-n
10154-1
10154-2
MULTIDIMENSIONAL DATA ANALYSIS REQUEST
10155-1
10155-2
10155-n
10107
MULTIDIMENSIONAL DATA PROCESSING MODULE
10108
MULTIDIMENSIONAL DATA STORE
MULTIDIMENSIONAL DATA DOMAIN
10116
10156-1
MULTIDIMENSIONAL DATA ANALYSIS RESULT
FIRST NOTATION CHARACTER CLASS
REPRESENTATIVE PHONETIC TRANSCRIPTION
FIRST SYLLABLE REPRESENTATION COLUMN
PHONETIC COLUMN
REPRESENTATION COLUMN
RECORD IDENTIFIER
【KANJI】
【あ】
【あし】
10156-2
MULTIDIMENSIONAL DATA ANALYSIS RESULT
PHONETIC COLUMN
REPRESENTATION COLUMN
RECORD IDENTIFIER
【あだち おさむ】
【あだち たかし】
【あんどう いちろう】
10156-n
MULTIDIMENSIONAL DATA ANALYSIS RESULT
REPRESENTATION COLUMN
RECORD IDENTIFIER
【安達 隆志】
rid2
【安田 忠士】
rid9
【安藤 一郎】
rid3

FIG. 34

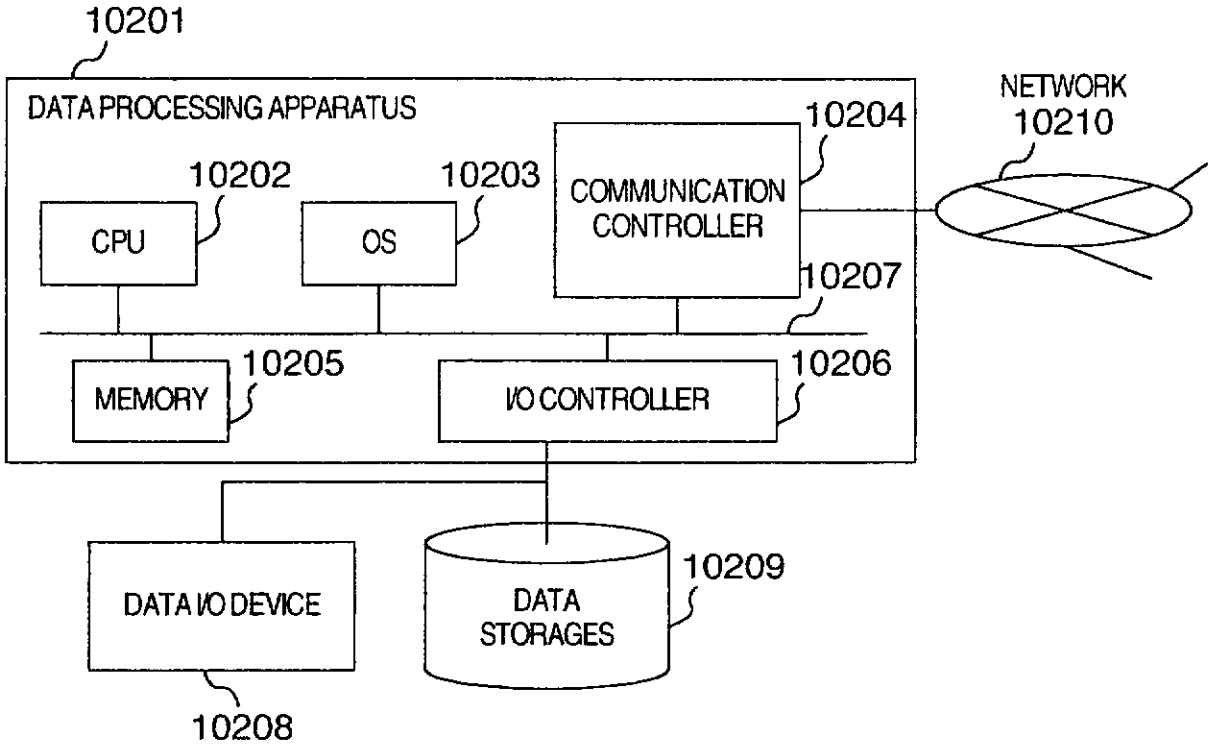


FIG. 35

10115 NAME LIST TABLE

	10301 NAME CHAR(16)	10302 KANA PHONETIC TRANSCRIPTION CHAR(16)		10303 RECORD IDENTIFIER
10304	足立 修	あだち おさむ	...	rid1
10305	安達 隆志	あだち たかし	...	rid2
10306	安藤 一郎	あんどう いちろう	...	rid3
10307	角田 正史	かくた まさし	...	rid4
10308	角田 雅志	かくた まさし	...	rid5
10309	勝山 昇	かつやま のぼる	...	rid6
10310	角田 徹	かどた とおる	...	rid7
10311	角田 健	つのだ けん	...	rid8
10312	安田 忠士	やすだ ただし	...	rid9
	...	...	...	...

30 APR 2004

FIG. 36

10110

10401 INDEX IDENTIFIER	10402 TABLE IDENTIFIER	10403 COLUMN IDENTIFIER	10404 COLLATION MODULE IDENTIFIER	10405 COLLATION ELEMENT TYPE
NAME LIST COLLATION INDEX	NAME LIST	NAME	jisx4061	REPRESENTATION COLUMN
NAME LIST COLLATION INDEX	NAME LIST	KANA PHONETIC TRANSCRIPTION	jisx4061	PHONETIC COLUMN
...	...	...	...	...

10406

10407

FIG. 37

10113

10501 COLLATION METHOD IDENTIFIER	10502 COLLATING KEY IDENTIFIER	10503 COLLATION STAGE	
REPRESENTATIVE PHONETIC COLLATION METHOD	FIRST NOTATION CHARACTER CLASS	1	10504
REPRESENTATIVE PHONETIC COLLATION METHOD	REPRESENTATIVE PHONETIC TRANSCRIPTION	2	10505
REPRESENTATIVE PHONETIC COLLATION METHOD	FIRST SYLLABLE REPRESENTATION COLUMN	3	10506
REPRESENTATIVE PHONETIC COLLATION METHOD	PHONETIC COLUMN	4	10507
REPRESENTATIVE PHONETIC COLLATION METHOD	REPRESENTATION COLUMN	5	10508
PHONETIC TRANSCRIPTION - REPRESENTATION COLLATION METHOD	PHONETIC COLUMN	1	10509
PHONETIC TRANSCRIPTION - REPRESENTATION COLLATION METHOD	REPRESENTATION COLUMN	2	10510
SIMPLE COLLATION METHOD	REPRESENTATION COLUMN	1	10511
...	...	...	

FIG. 38

10114

10601 COLLATING KEY IDENTIFIER	10602 DIMENSION IDENTIFIER	
FIRST NOTATION CHARACTER CLASS	FIRST NOTATION CHARACTER CLASS	10603
REPRESENTATIVE PHONETIC TRANSCRIPTION	REPRESENTATIVE PHONETIC TRANSCRIPTION	10604
FIRST SYLLABLE REPRESENTATION COLUMN	FIRST SYLLABLE REPRESENTATION COLUMN	10605
PHONETIC COLUMN	PHONETIC COLUMN	10606
REPRESENTATION COLUMN	REPRESENTATION COLUMN	10607
...	...	

FIG. 39

10112

10701 INDEX IDENTIFIER	10702 DOMAIN IDENTIFIER	
NAME LIST COLLATION INDEX	NAME LIST COLLATION DOMAIN	10703
...	...	

FIG. 41

10802

10901 COLLATION MODULE IDENTIFIER	10902 COLLATION METHOD IDENTIFIER	
jisx4061	REPRESENTATIVE PHONETIC COLLATION METHOD	10903
jisx4061	PHONETIC TRANSCRIPTION - REPRESENTATION COLLATION METHOD	10904
jisx4061	SIMPLE COLLATION METHOD	10905
...	...	

FIG. 40

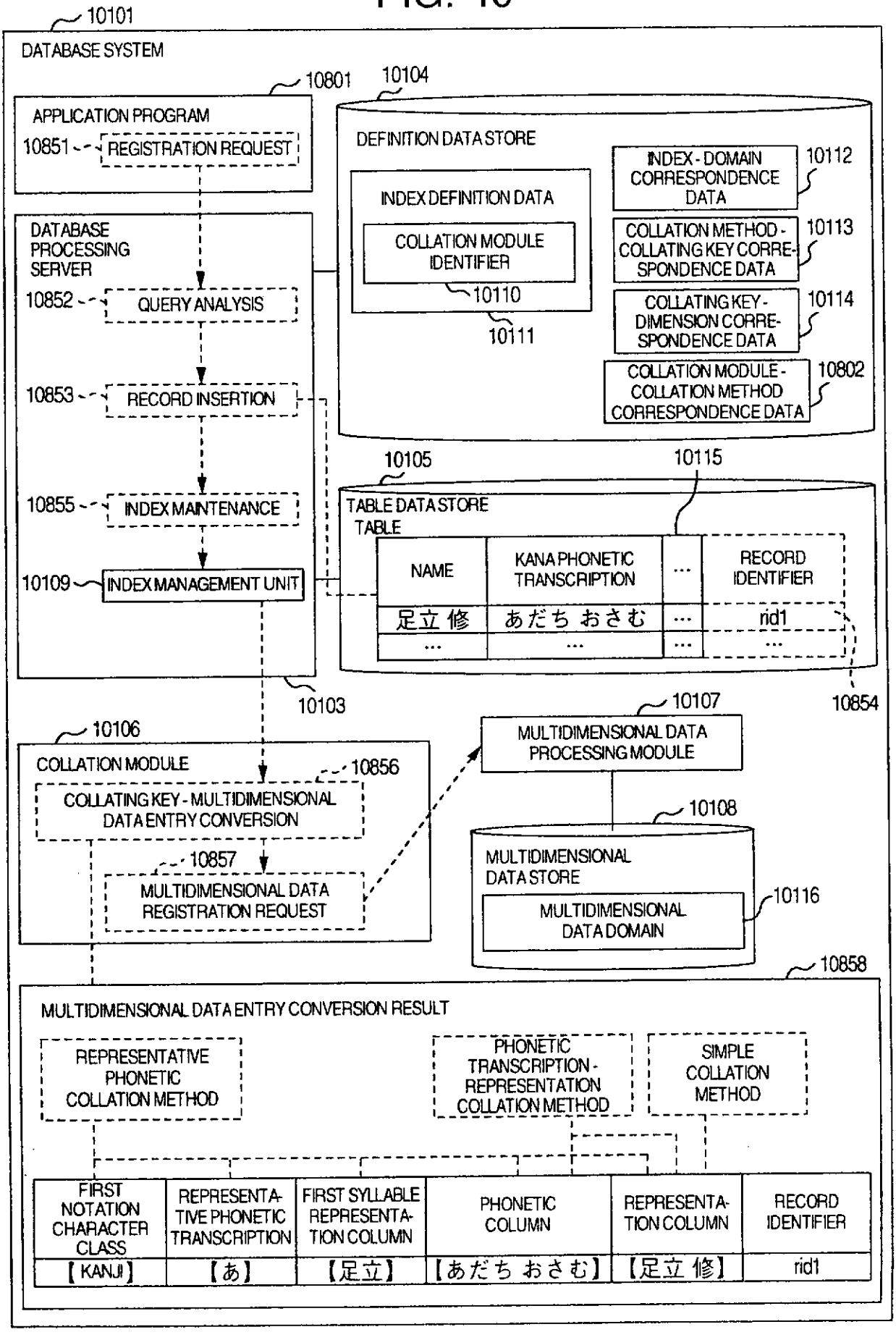

10101
DATABASE SYSTEM
10801
APPLICATION PROGRAM
10851
REGISTRATION REQUEST
DATABASE PROCESSING SERVER
10852
QUERY ANALYSIS
10853
RECORD INSERTION
10855
INDEX MAINTENANCE
10109
INDEX MANAGEMENT UNIT
10103
10104
DEFINITION DATA STORE
INDEX DEFINITION DATA
COLLATION MODULE IDENTIFIER
10110
10111
INDEX - DOMAIN CORRESPONDENCE DATA
10112
COLLATION METHOD - COLLATING KEY CORRESPONDENCE DATA
10113
COLLATING KEY - DIMENSION CORRESPONDENCE DATA
10114
COLLATION MODULE - COLLATION METHOD CORRESPONDENCE DATA
10802
10105
10115
TABLE DATA STORE
TABLE
NAME
KANA PHONETIC TRANSCRIPTION
...
RECORD IDENTIFIER
足立 修
あだち おさむ
...
rid1
10854
10106
COLLATION MODULE
10856
COLLATING KEY - MULTIDIMENSIONAL DATA ENTRY CONVERSION
10857
MULTIDIMENSIONAL DATA REGISTRATION REQUEST
10107
MULTIDIMENSIONAL DATA PROCESSING MODULE
10108
MULTIDIMENSIONAL DATA STORE
MULTIDIMENSIONAL DATA DOMAIN
10116
10858
MULTIDIMENSIONAL DATA ENTRY CONVERSION RESULT
REPRESENTATIVE PHONETIC COLLATION METHOD
PHONETIC TRANSCRIPTION - REPRESENTATION COLLATION METHOD
SIMPLE COLLATION METHOD
FIRST NOTATION CHARACTER CLASS
REPRESENTATIVE PHONETIC TRANSCRIPTION
FIRST SYLLABLE REPRESENTATION COLUMN
PHONETIC COLUMN
REPRESENTATION COLUMN
RECORD IDENTIFIER
【KANJI】
【あ】
【足立】
【あだち おさむ】
【足立 修】
rid1

FIG. 42

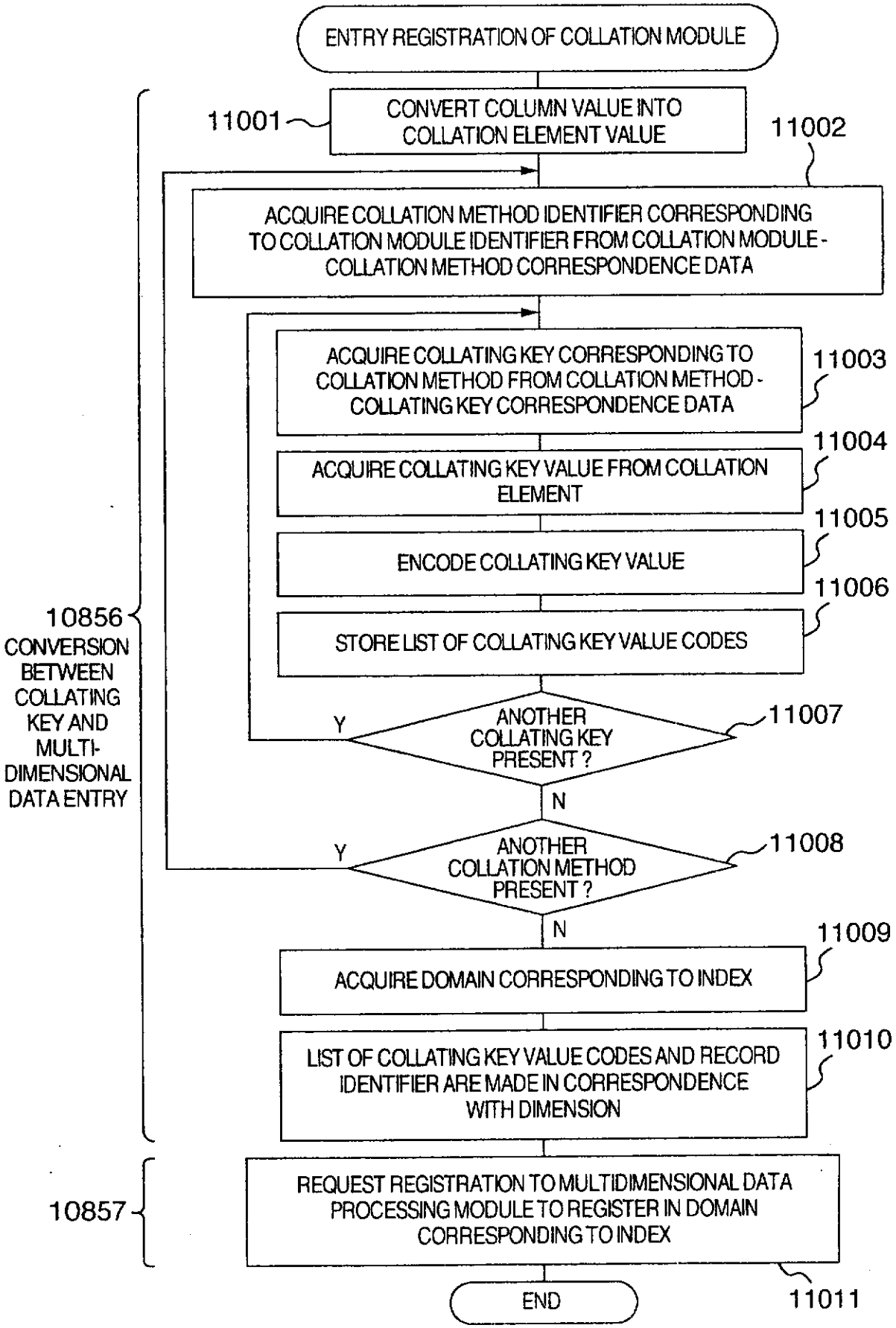

ENTRY REGISTRATION OF COLLATION MODULE
11001
CONVERT COLUMN VALUE INTO COLLATION ELEMENT VALUE
11002
ACQUIRE COLLATION METHOD IDENTIFIER CORRESPONDING TO COLLATION MODULE IDENTIFIER FROM COLLATION MODULE - COLLATION METHOD CORRESPONDENCE DATA
ACQUIRE COLLATING KEY CORRESPONDING TO COLLATION METHOD FROM COLLATION METHOD - COLLATING KEY CORRESPONDENCE DATA
11003
ACQUIRE COLLATING KEY VALUE FROM COLLATION ELEMENT
11004
ENCODE COLLATING KEY VALUE
11005
STORE LIST OF COLLATING KEY VALUE CODES
11006
ANOTHER COLLATING KEY PRESENT ?
Y
11007
N
ANOTHER COLLATION METHOD PRESENT ?
Y
11008
N
ACQUIRE DOMAIN CORRESPONDING TO INDEX
11009
LIST OF COLLATING KEY VALUE CODES AND RECORD IDENTIFIER ARE MADE IN CORRESPONDENCE WITH DIMENSION
11010
10856
CONVERSION BETWEEN COLLATING KEY AND MULTI-DIMENSIONAL DATA ENTRY
REQUEST REGISTRATION TO MULTIDIMENSIONAL DATA PROCESSING MODULE TO REGISTER IN DOMAIN CORRESPONDING TO INDEX
10857
END
11011

FIG. 43

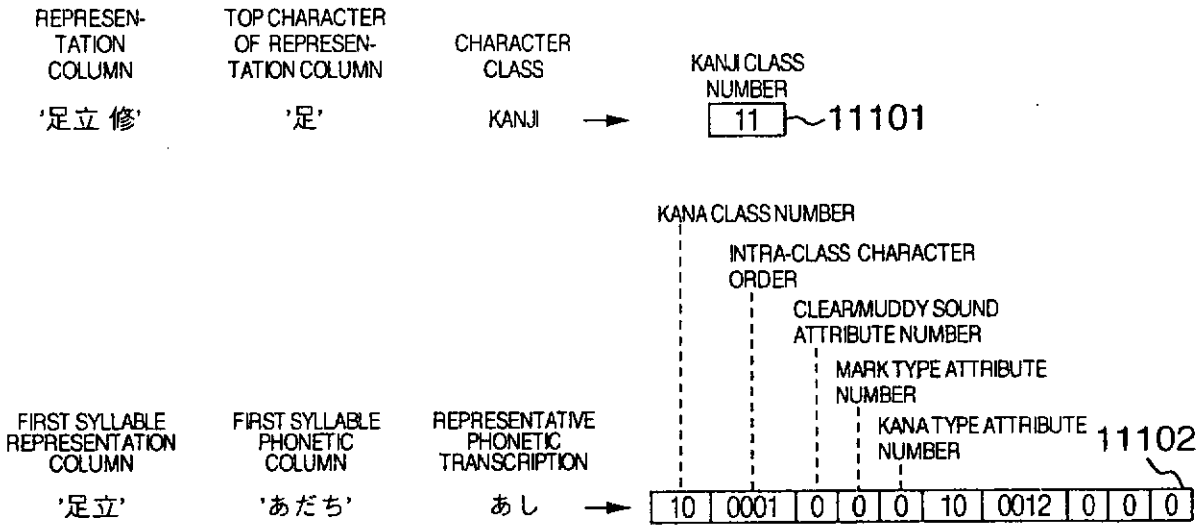
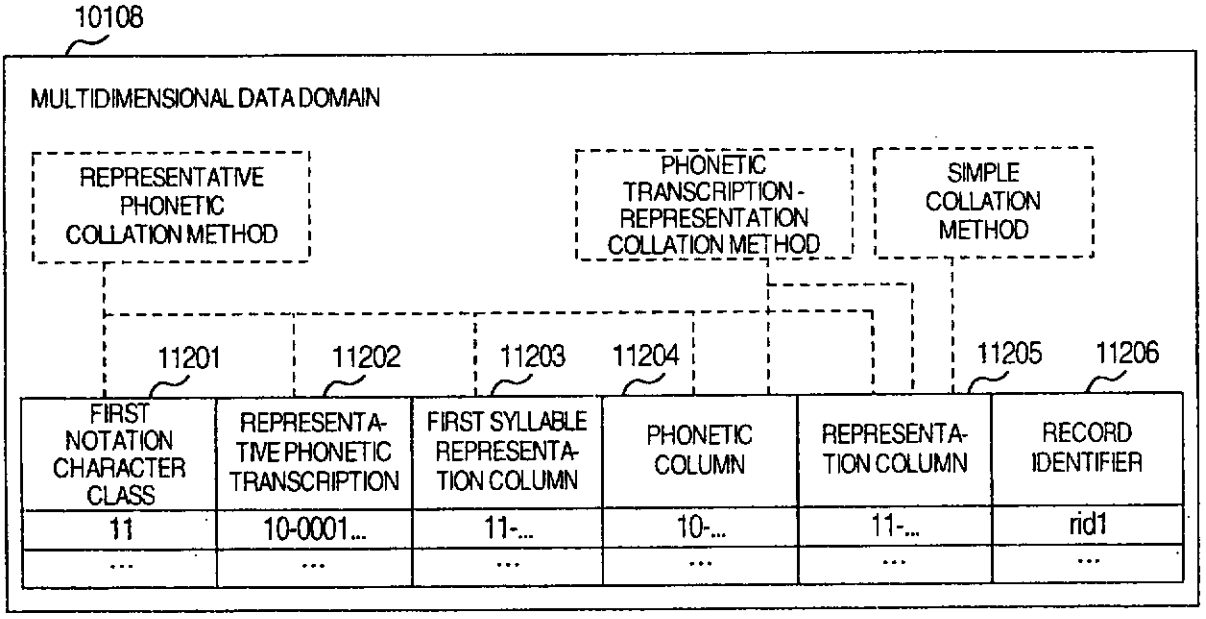

REPRESEN-TATION COLUMN
'足立 修'
TOP CHARACTER OF REPRESEN-TATION COLUMN
'足'
CHARACTER CLASS
KANJI
KANJI CLASS NUMBER
11
11101
KANA CLASS NUMBER
INTRA-CLASS CHARACTER ORDER
CLEAR/MUDDY SOUND ATTRIBUTE NUMBER
MARK TYPE ATTRIBUTE NUMBER
KANA TYPE ATTRIBUTE NUMBER
11102
FIRST SYLLABLE REPRESENTATION COLUMN
'足立'
FIRST SYLLABLE PHONETIC COLUMN
'あだち'
REPRESENTATIVE PHONETIC TRANSCRIPTION
あし
10 0001 0 0 0 10 0012 0 0 0

FIG. 44


10108
MULTIDIMENSIONAL DATA DOMAIN
REPRESENTATIVE PHONETIC COLLATION METHOD
PHONETIC TRANSCRIPTION - REPRESENTATION COLLATION METHOD
SIMPLE COLLATION METHOD
11201
11202
11203
11204
11205
11206
FIRST NOTATION CHARACTER CLASS
REPRESENTA-TIVE PHONETIC TRANSCRIPTION
FIRST SYLLABLE REPRESENTA-TION COLUMN
PHONETIC COLUMN
REPRESENTA-TION COLUMN
RECORD IDENTIFIER
11
10-0001...
11-...
10-...
11-...
rid1

30 APR 2004

FIG. 45

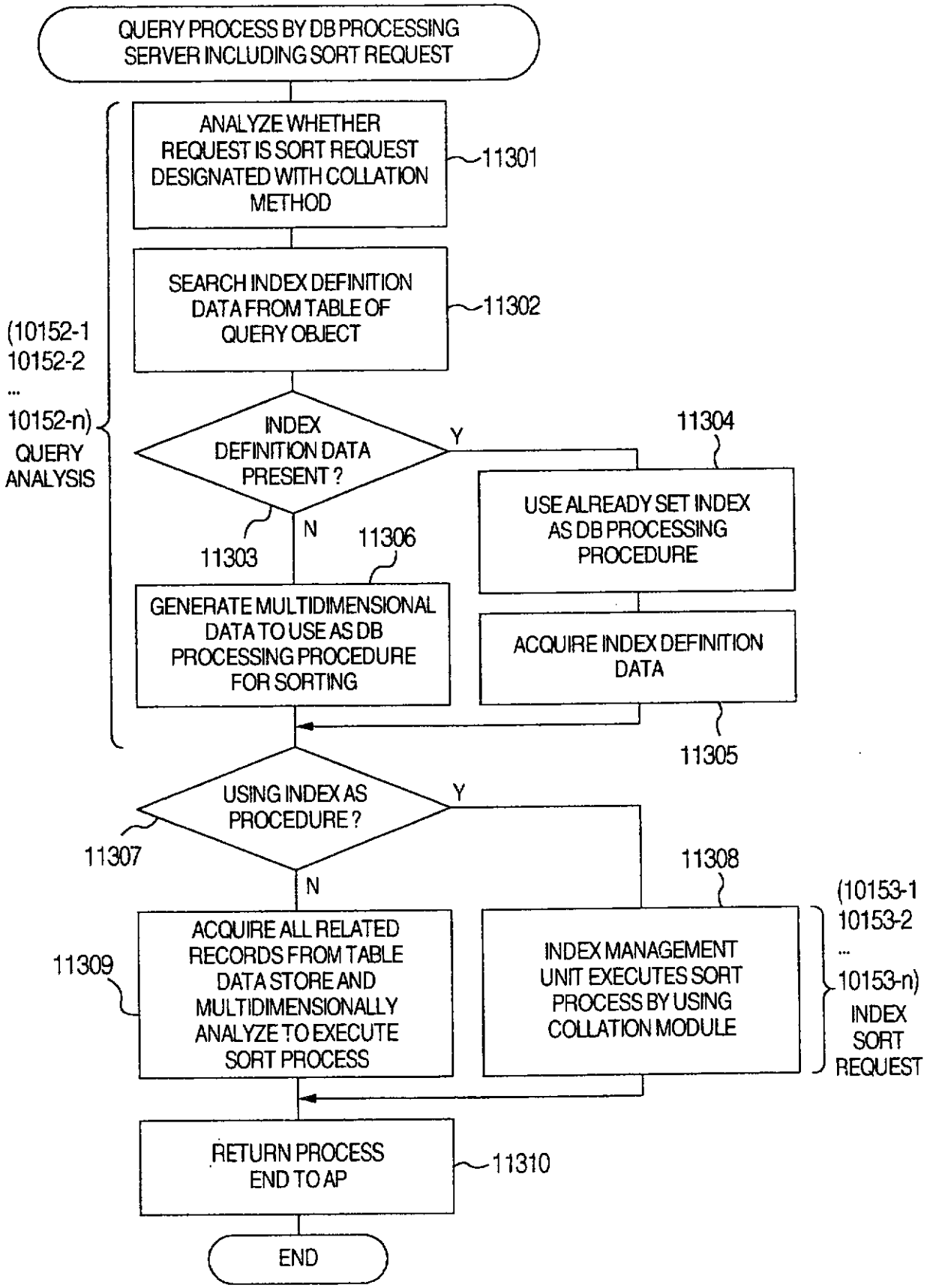


FIG. 46

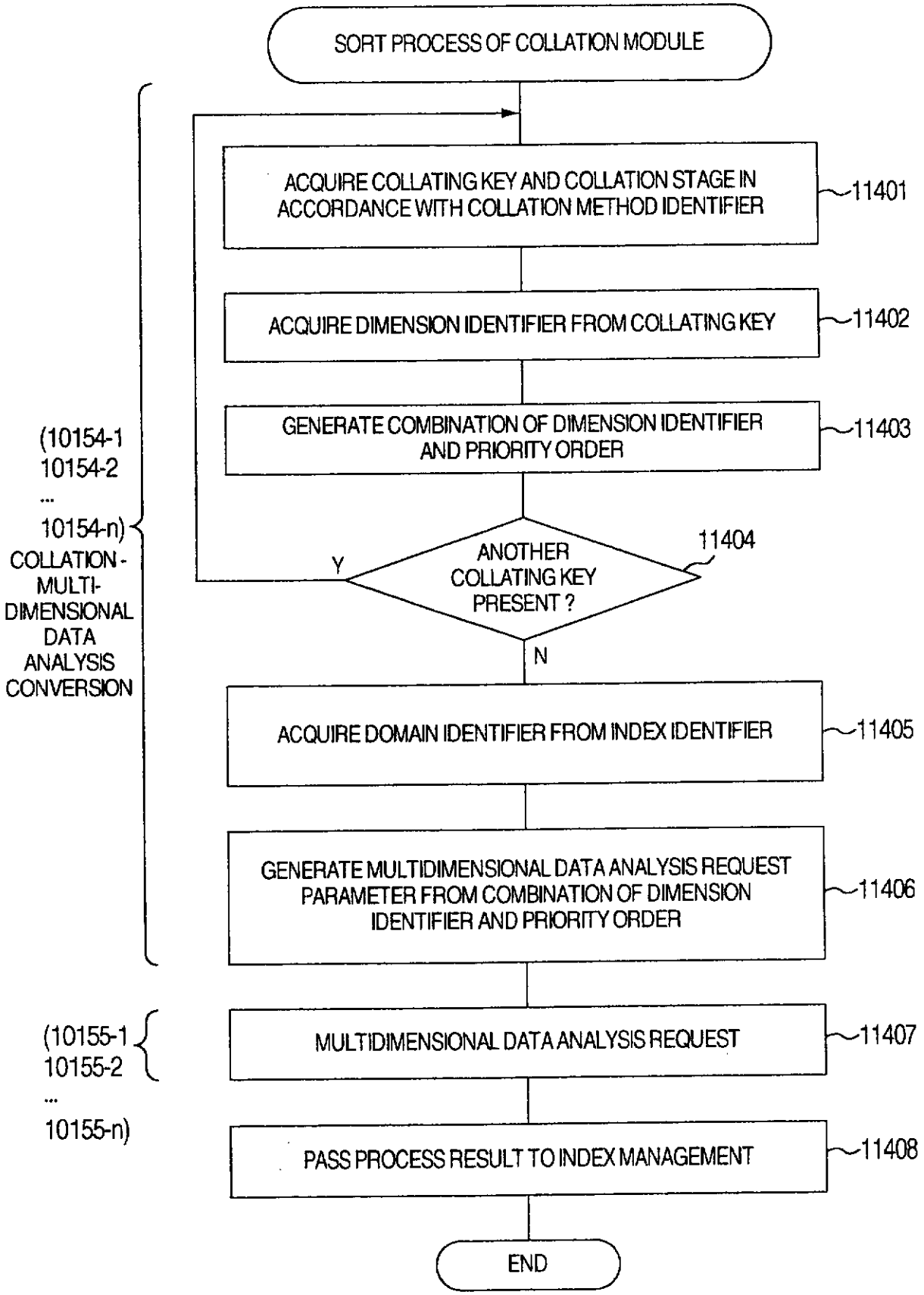

SORT PROCESS OF COLLATION MODULE
ACQUIRE COLLATING KEY AND COLLATION STAGE IN ACCORDANCE WITH COLLATION METHOD IDENTIFIER
11401
ACQUIRE DIMENSION IDENTIFIER FROM COLLATING KEY
11402
GENERATE COMBINATION OF DIMENSION IDENTIFIER AND PRIORITY ORDER
11403
ANOTHER COLLATING KEY PRESENT ?
11404
Y
N
ACQUIRE DOMAIN IDENTIFIER FROM INDEX IDENTIFIER
11405
GENERATE MULTIDIMENSIONAL DATA ANALYSIS REQUEST PARAMETER FROM COMBINATION OF DIMENSION IDENTIFIER AND PRIORITY ORDER
11406
MULTIDIMENSIONAL DATA ANALYSIS REQUEST
11407
PASS PROCESS RESULT TO INDEX MANAGEMENT
11408
END
(10154-1 10154-2 ... 10154-n) COLLATION - MULTI-DIMENSIONAL DATA ANALYSIS CONVERSION
(10155-1 10155-2 ... 10155-n)

FIG. 47

10156-1

MULTIDIMENSIONAL DATA ANALYSIS RESULT

FIRST NOTATION CHARACTER CLASS	REPRESENTATIVE PHONETIC TRANSCRIPTION	FIRST SYLLABLE REPRESENTATION COLUMN	PHONETIC COLUMN	REPRESENTATION COLUMN	RECORD IDENTIFIER
【KANJI】	【あ】	【安達】	【あだち たかし】	【安達 隆志】	rid2
【KANJI】	【あ】	【安藤】	【あんどう いちろう】	【安藤 一郎】	rid3
【KANJI】	【あし】	【足立】	【あだち おさむ】	【足立 修】	rid1
【KANJI】	【か】	【角田】	【かくた まさし】	【角田 雅志】	rid5
【KANJI】	【か】	【角田】	【かくた まさし】	【角田 正史】	rid4
【KANJI】	【か】	【角田】	【かどた とおる】	【角田 徹】	rid7
【KANJI】	【かち】	【勝山】	【かつやま のぼる】	【勝山 昇】	rid6
【KANJI】	【つの】	【角田】	【つのだ けん】	【角田 健】	rid8
【KANJI】	【やす】	【安田】	【やすだ ただし】	【安田 忠士】	rid9
…	…	…	…	…	…

10156-2

MULTIDIMENSIONAL DATA ANALYSIS RESULT

PHONETIC COLUMN	REPRESENTATION COLUMN	RECORD IDENTIFIER
【あだち おさむ】	【足立 修】	rid1
【あだち たかし】	【安達 隆志】	rid2
【あんどう いちろう】	【安藤 一郎】	rid3
【かくた まさし】	【角田 雅志】	rid5
【かくた まさし】	【角田 正史】	rid4
【かどた とおる】	【角田 徹】	rid6
【かつやま のぼる】	【勝山 昇】	rid7
【つのだ けん】	【角田 健】	rid8
【やすだ ただし】	【安田 忠士】	rid9
…	…	…

10156-n

MULTIDIMENSIONAL DATA ANALYSIS RESULT

REPRESENTATION COLUMN	RECORD IDENTIFIER
【安達 隆志】	rid2
【安田 忠士】	rid9
【安藤 一郎】	rid3
【角田 雅志】	rid5
【角田 健】	rid8
【角田 正史】	rid4
【角田 徹】	rid7
【勝山 昇】	rid6
【足立 修】	rid1
…	…

FIG. 48

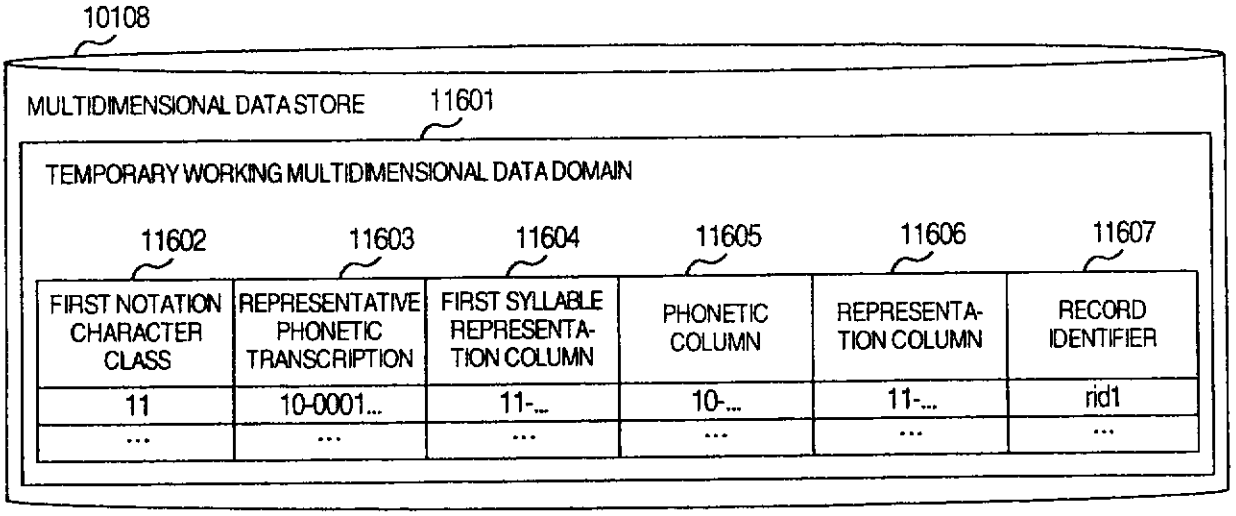

10108
MULTIDIMENSIONAL DATA STORE
11601
TEMPORARY WORKING MULTIDIMENSIONAL DATA DOMAIN
11602
11603
11604
11605
11606
11607
FIRST NOTATION CHARACTER CLASS
REPRESENTATIVE PHONETIC TRANSCRIPTION
FIRST SYLLABLE REPRESENTATION COLUMN
PHONETIC COLUMN
REPRESENTATION COLUMN
RECORD IDENTIFIER
11
10-0001...
11-...
10-...
11-...
rid1
...
...
...
...
...
...

FIG. 49

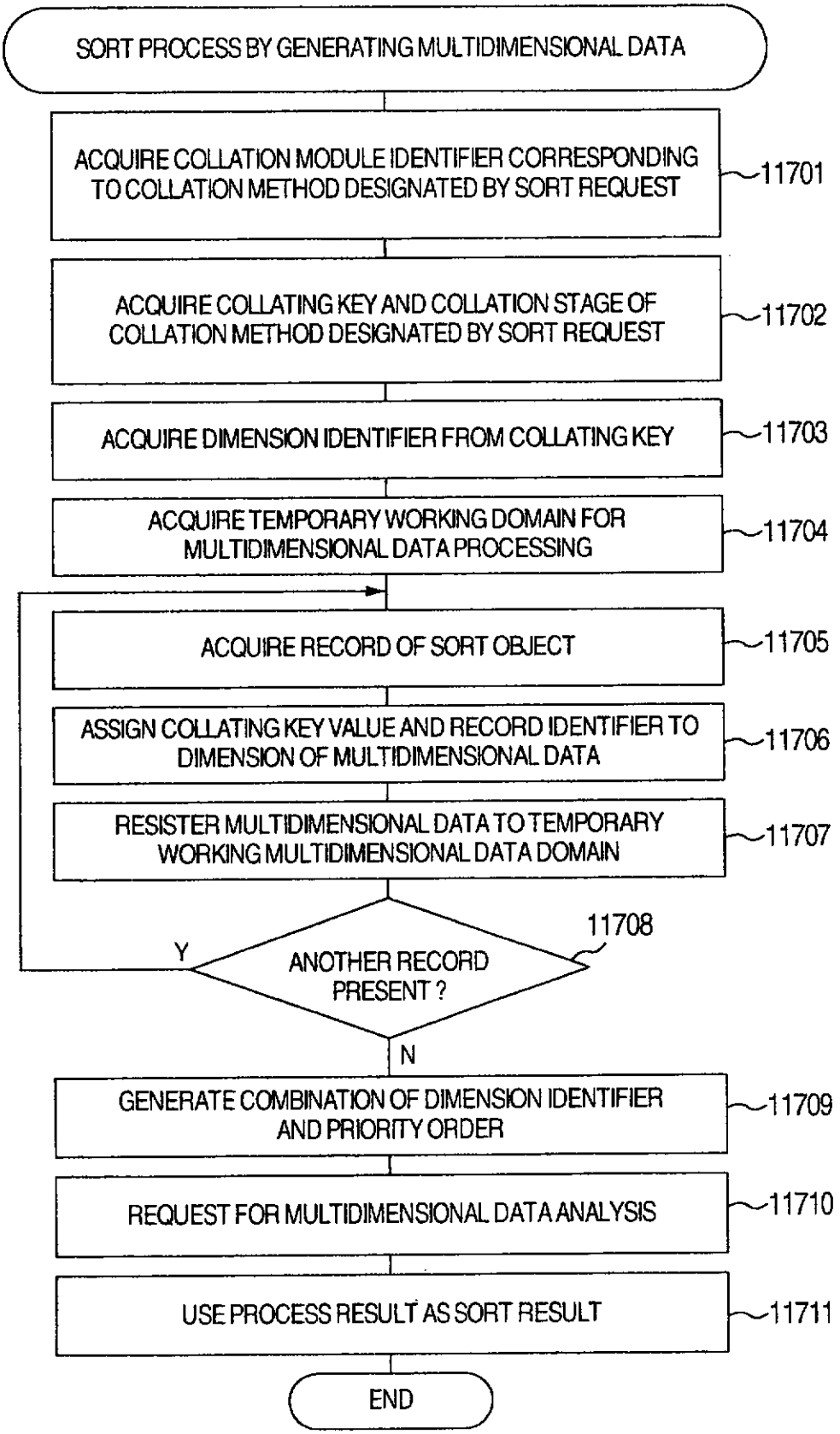

SORT PROCESS BY GENERATING MULTIDIMENSIONAL DATA
ACQUIRE COLLATION MODULE IDENTIFIER CORRESPONDING TO COLLATION METHOD DESIGNATED BY SORT REQUEST
11701
ACQUIRE COLLATING KEY AND COLLATION STAGE OF COLLATION METHOD DESIGNATED BY SORT REQUEST
11702
ACQUIRE DIMENSION IDENTIFIER FROM COLLATING KEY
11703
ACQUIRE TEMPORARY WORKING DOMAIN FOR MULTIDIMENSIONAL DATA PROCESSING
11704
ACQUIRE RECORD OF SORT OBJECT
11705
ASSIGN COLLATING KEY VALUE AND RECORD IDENTIFIER TO DIMENSION OF MULTIDIMENSIONAL DATA
11706
RESISTER MULTIDIMENSIONAL DATA TO TEMPORARY WORKING MULTIDIMENSIONAL DATA DOMAIN
11707
ANOTHER RECORD PRESENT ?
11708
Y
N
GENERATE COMBINATION OF DIMENSION IDENTIFIER AND PRIORITY ORDER
11709
REQUEST FOR MULTIDIMENSIONAL DATA ANALYSIS
11710
USE PROCESS RESULT AS SORT RESULT
11711
END

FIG. 50

10113

COLLATION METHOD IDENTIFIER	COLLATING KEY IDENTIFIER	COLLATION STAGE	
REPRESENTATIVE PHONETIC COLLATION METHOD	FIRST NOTATION CHARACTER CLASS	1	
REPRESENTATIVE PHONETIC COLLATION METHOD	REPRESENTATIVE PHONETIC TRANSCRIPTION	2	
REPRESENTATIVE PHONETIC COLLATION METHOD	FIRST SYLLABLE REPRESENTATION COLUMN	3	
REPRESENTATIVE PHONETIC COLLATION METHOD	PHONETIC COLUMN	4	
REPRESENTATIVE PHONETIC COLLATION METHOD	REPRESENTATION COLUMN	5	
PHONETIC TRANSCRIPTION - REPRESENTATION COLLATION METHOD	PHONETIC COLUMN	1	
PHONETIC TRANSCRIPTION - REPRESENTATION COLLATION METHOD	REPRESENTATION COLUMN	2	
SIMPLE COLLATION METHOD	REPRESENTATION COLUMN	1	
REPRESENTATIVE PHONETIC STROKE COLLATION METHOD	FIRST NOTATION CHARACTER CLASS	1	11801
REPRESENTATIVE PHONETIC STROKE COLLATION METHOD	REPRESENTATIVE PHONETIC TRANSCRIPTION	2	11802
REPRESENTATIVE PHONETIC STROKE COLLATION METHOD	FIRST SYLLABLE REPRESENTATION COLUMN	3	11803
REPRESENTATIVE PHONETIC STROKE COLLATION METHOD	PHONETIC COLUMN	4	11804
REPRESENTATIVE PHONETIC STROKE COLLATION METHOD	REPRESENTATION COLUMN STROKE NUMBER	5	11805
PHONETIC TRANSCRIPTION - REPRESENTATION STROKE COLLATION METHOD	PHONETIC COLUMN	1	11806
PHONETIC TRANSCRIPTION - REPRESENTATION STROKE COLLATION METHOD	REPRESENTATION COLUMN STROKE NUMBER	2	11807
SIMPLE STROKE COLLATION METHOD	REPRESENTATION COLUMN STROKE NUMBER	1	11808
...	...	...	

10114

COLLATING KEY IDENTIFIER	DIMENSION IDENTIFIER	
FIRST NOTATION CHARACTER CLASS	FIRST NOTATION CHARACTER CLASS	
REPRESENTATIVE PHONETIC TRANSCRIPTION	REPRESENTATIVE PHONETIC TRANSCRIPTION	
FIRST SYLLABLE REPRESENTATION COLUMN	FIRST SYLLABLE REPRESENTATION COLUMN	
PHONETIC COLUMN	PHONETIC COLUMN	
REPRESENTATION COLUMN	REPRESENTATION COLUMN	
REPRESENTATION COLUMN STROKE NUMBER	REPRESENTATION COLUMN STROKE NUMBER	11809
...	...	

10802

COLLATION MODULE IDENTIFIER	COLLATION METHOD IDENTIFIER	
jisx4061	REPRESENTATIVE PHONETIC COLLATION METHOD	
jisx4061	PHONETIC TRANSCRIPTION - REPRESENTATION COLLATION METHOD	
jisx4061	SIMPLE COLLATION METHOD	
jisx4061	REPRESENTATIVE PHONETIC STROKE COLLATION METHOD	11810
jisx4061	PHONETIC TRANSCRIPTION - REPRESENTATION STROKE COLLATION METHOD	11811
jisx4061	SIMPLE STROKE COLLATION METHOD	11812
...	...	

FIG. 51

11901

MULTIDIMENSIONAL DATA ANALYSIS RESULT

FIRST NOTATION CHARACTER CLASS	REPRESENTATIVE PHONETIC TRANSCRIPTION	FIRST SYLLABLE REPRESENTATION COLUMN	PHONETIC COLUMN	REPRESENTATION COLUMN STROKE NUMBER	RECORD IDENTIFIER
【KANJI】	【あ】	【安達】	【あだち たかし】	【安達 隆志】	rid2
【KANJI】	【あ】	【安藤】	【あんどう いちろう】	【安藤 一郎】	rid3
【KANJI】	【あし】	【足立】	【あだち おさむ】	【足立 修】	rid1
【KANJI】	【か】	【角田】	【かくた まさし】	【角田 正史】	rid4
【KANJI】	【か】	【角田】	【かくた まさし】	【角田 雅志】	rid5
【KANJI】	【か】	【角田】	【かどた とおる】	【角田 徹】	rid7
【KANJI】	【かち】	【勝山】	【かつやま のぼる】	【勝山 昇】	rid6
【KANJI】	【つの】	【角田】	【つのだ けん】	【角田 健】	rid8
【KANJI】	【やす】	【安田】	【やすだ ただし】	【安田 忠士】	rid9
…	…	…	…	…	…

11902

MULTIDIMENSIONAL DATA ANALYSIS RESULT

PHONETIC COLUMN	REPRESENTATION COLUMN STROKE NUMBER	RECORD IDENTIFIER
【あだち おさむ】	【足立 修】	rid1
【あだち たかし】	【安達 隆志】	rid2
【あんどう いちろう】	【安藤 一郎】	rid3
【かくた まさし】	【角田 正史】	rid4
【かくた まさし】	【角田 雅志】	rid5
【かどた とおる】	【角田 徹】	rid6
【かつやま のぼる】	【勝山 昇】	rid7
【つのだ けん】	【角田 健】	rid8
【やすだ ただし】	【安田 忠士】	rid9
…	…	…

11903

MULTIDIMENSIONAL DATA ANALYSIS RESULT

REPRESENTATION COLUMN STROKE NUMBER	RECORD IDENTIFIER
【安田 忠士】	rid9
【安達 隆志】	rid2
【安藤 一郎】	rid3
【足立 修】	rid1
【角田 正史】	rid4
【角田 健】	rid8
【角田 雅志】	rid5
【角田 徹】	rid7
【勝山 昇】	rid6
…	…

FIG. 52

10113

COLLATION METHOD IDENTIFIER	COLLATING KEY IDENTIFIER	COLLATION STAGE	
REPRESENTATION - PHONETIC TRANSCRIPTION COLLATION METHOD	REPRESENTATION COLUMN	1	12001
REPRESENTATION - PHONETIC TRANSCRIPTION COLLATION METHOD	PHONETIC COLUMN	2	12002
...	...	...	

12003

MULTIDIMENSIONAL DATA ANALYSIS RESULT

REPRESENTATION COLUMN	PHONETIC COLUMN	RECORD IDENTIFIER
【安達 隆志】	【あだち たかし】	rid2
【安田 忠士】	【やすだ ただし】	rid9
【安藤 一郎】	【あんどう いちろう】	rid3
【角田 雅志】	【かくた まさし】	rid5
【角田 健】	【つのだ けん】	rid8
【角田 正史】	【かくた まさし】	rid4
【角田 徹】	【かどた とおる】	rid6
【勝山 昇】	【かつやま のぼる】	rid7
【足立 修】	【あだち おさむ】	rid1
...	...	...

FIG. 53

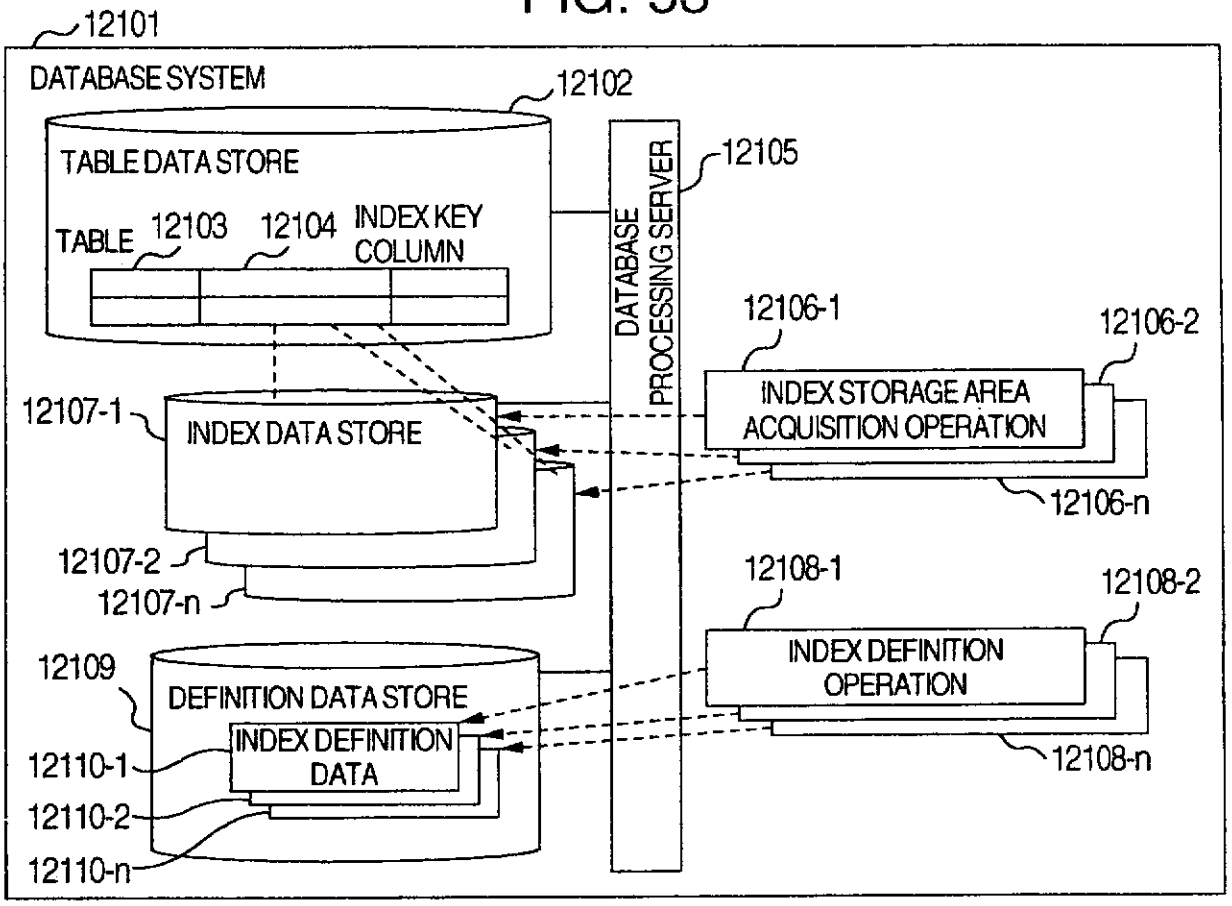

12101
DATABASE SYSTEM
12102
TABLE DATA STORE
TABLE
12103
12104
INDEX KEY COLUMN
DATABASE PROCESSING SERVER
12105
12106-1
12106-2
INDEX STORAGE AREA ACQUISITION OPERATION
12106-n
12107-1
INDEX DATA STORE
12107-2
12107-n
12108-1
12108-2
INDEX DEFINITION OPERATION
12108-n
12109
DEFINITION DATA STORE
INDEX DEFINITION DATA
12110-1
12110-2
12110-n

FIG. 54

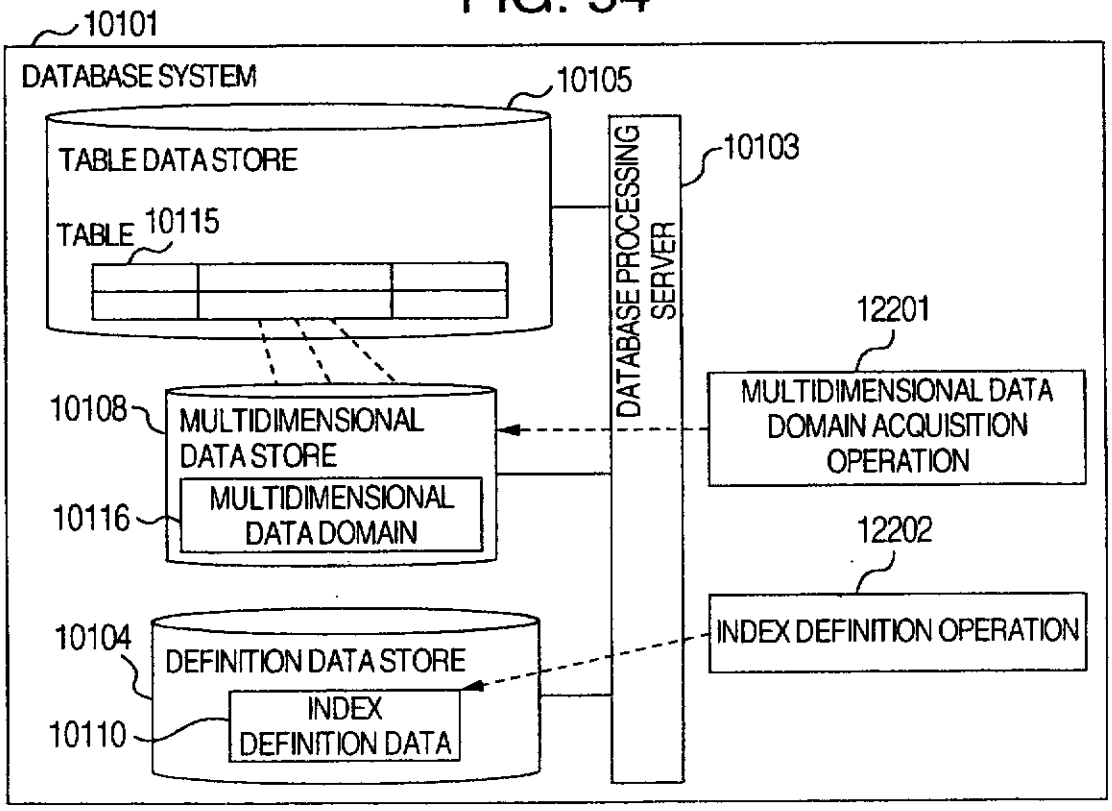

10101
DATABASE SYSTEM
10105
TABLE DATA STORE
TABLE
10115
DATABASE PROCESSING SERVER
10103
12201
MULTIDIMENSIONAL DATA DOMAIN ACQUISITION OPERATION
10108
MULTIDIMENSIONAL DATA STORE
10116
MULTIDIMENSIONAL DATA DOMAIN
12202
INDEX DEFINITION OPERATION
10104
DEFINITION DATA STORE
10110
INDEX DEFINITION DATA

FIG. 55

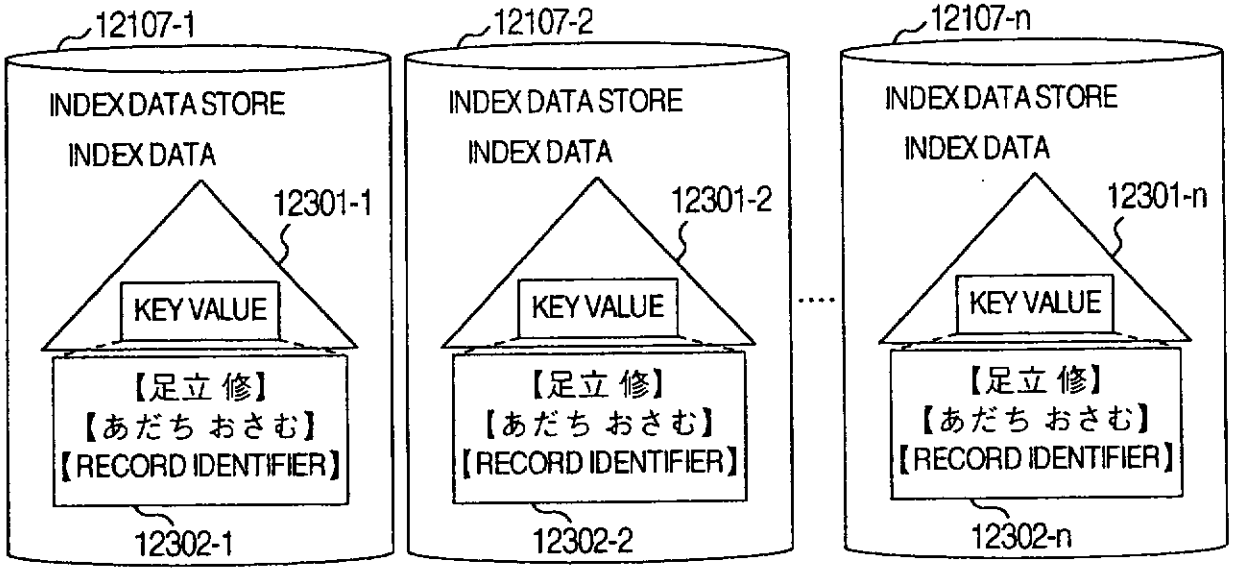
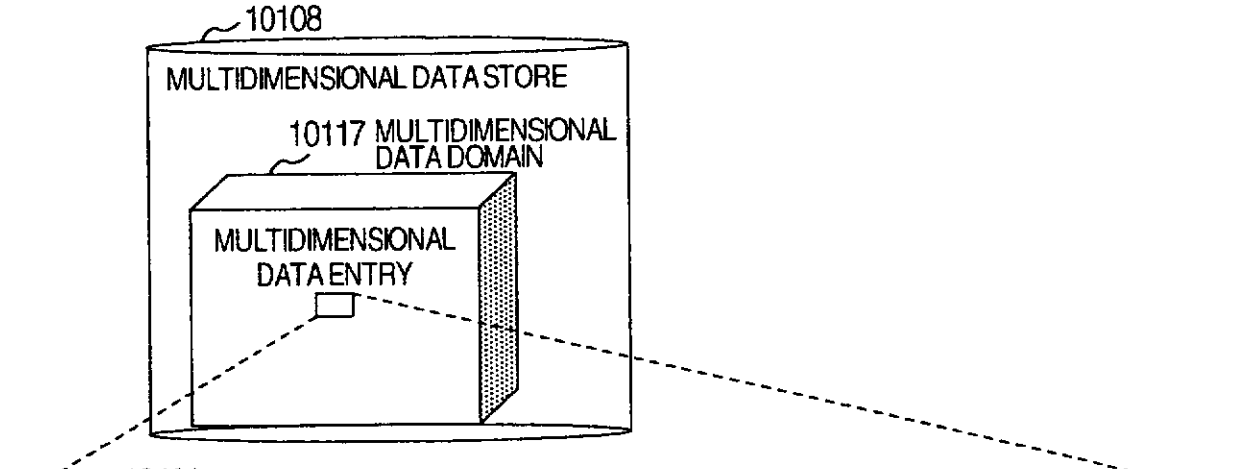


FIG. 56



12401

FIRST NOTATION CHARACTER CLASS	REPRESENTATIVE PHONETIC TRANSCRIPTION	FIRST SYLLABLE REPRESENTATION COLUMN	PHONETIC COLUMN	REPRESENTATION COLUMN	RECORD IDENTIFIER
【KANJI】	【あし】	【足立】	【あだち おさむ】	【足立 修】	rid1

FIG. 57

```
% setenv NLS_LANG German
SQL> SELECT letter FROM letters ORDER BY letter;
LETTER
......
a
ä
b
z
SQL> ALTER SESSI ON SET NLS_SORT = Swedish;
SQL> SELECT letter FROM letters ORDER BY letter;
LETTER
......
a
b
z
ä
```

FIG. 60

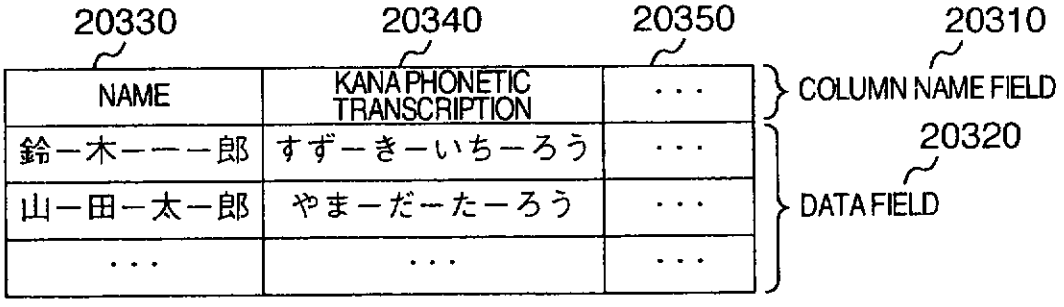


FIG. 58

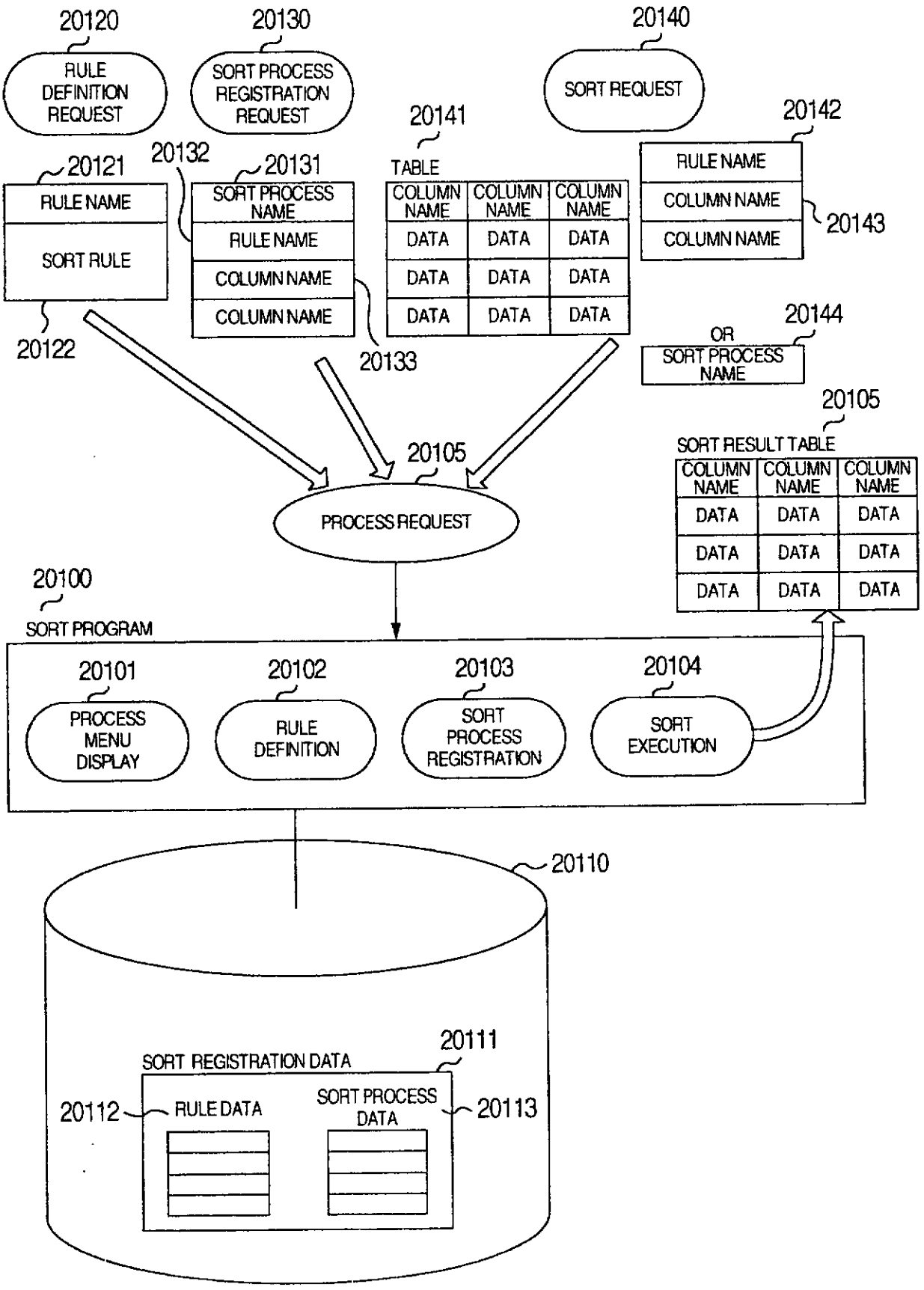

20120
RULE DEFINITION REQUEST
20130
SORT PROCESS REGISTRATION REQUEST
20140
SORT REQUEST
20141
TABLE
COLUMN NAME
COLUMN NAME
COLUMN NAME
DATA
DATA
DATA
20142
RULE NAME
COLUMN NAME
COLUMN NAME
20143
20121
RULE NAME
SORT RULE
20122
20132
20131
SORT PROCESS NAME
RULE NAME
COLUMN NAME
COLUMN NAME
20133
20144
OR
SORT PROCESS NAME
20105
SORT RESULT TABLE
20105
PROCESS REQUEST
20100
SORT PROGRAM
20101
PROCESS MENU DISPLAY
20102
RULE DEFINITION
20103
SORT PROCESS REGISTRATION
20104
SORT EXECUTION
20110
20111
SORT REGISTRATION DATA
20112
RULE DATA
SORT PROCESS DATA
20113

FIG. 59

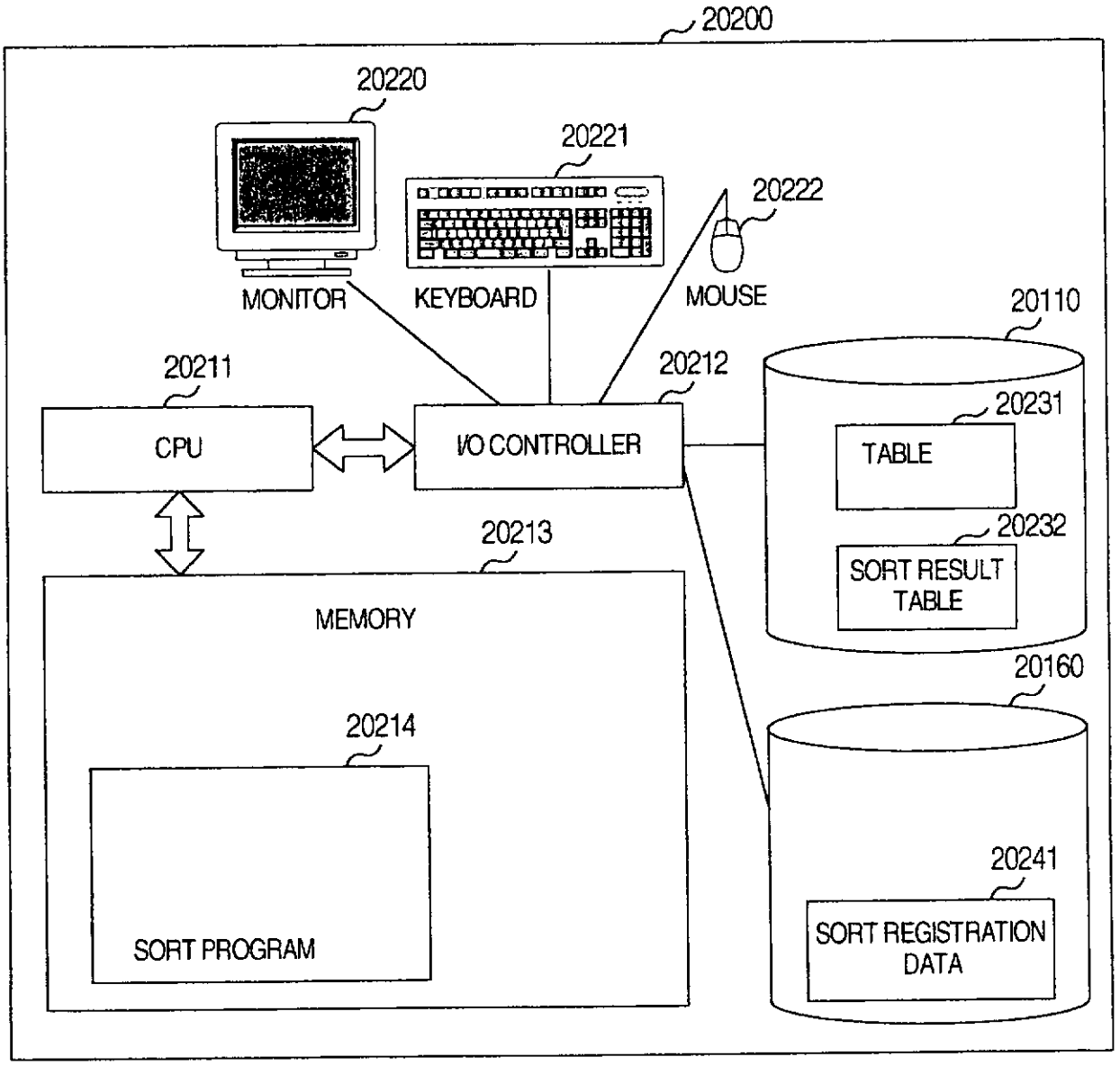

20200
20220
20221
20222
MONITOR
KEYBOARD
MOUSE
20110
20211
20212
20231
CPU
I/O CONTROLLER
TABLE
20232
SORT RESULT TABLE
20213
MEMORY
20160
20214
20241
SORT PROGRAM
SORT REGISTRATION DATA

FIG. 61

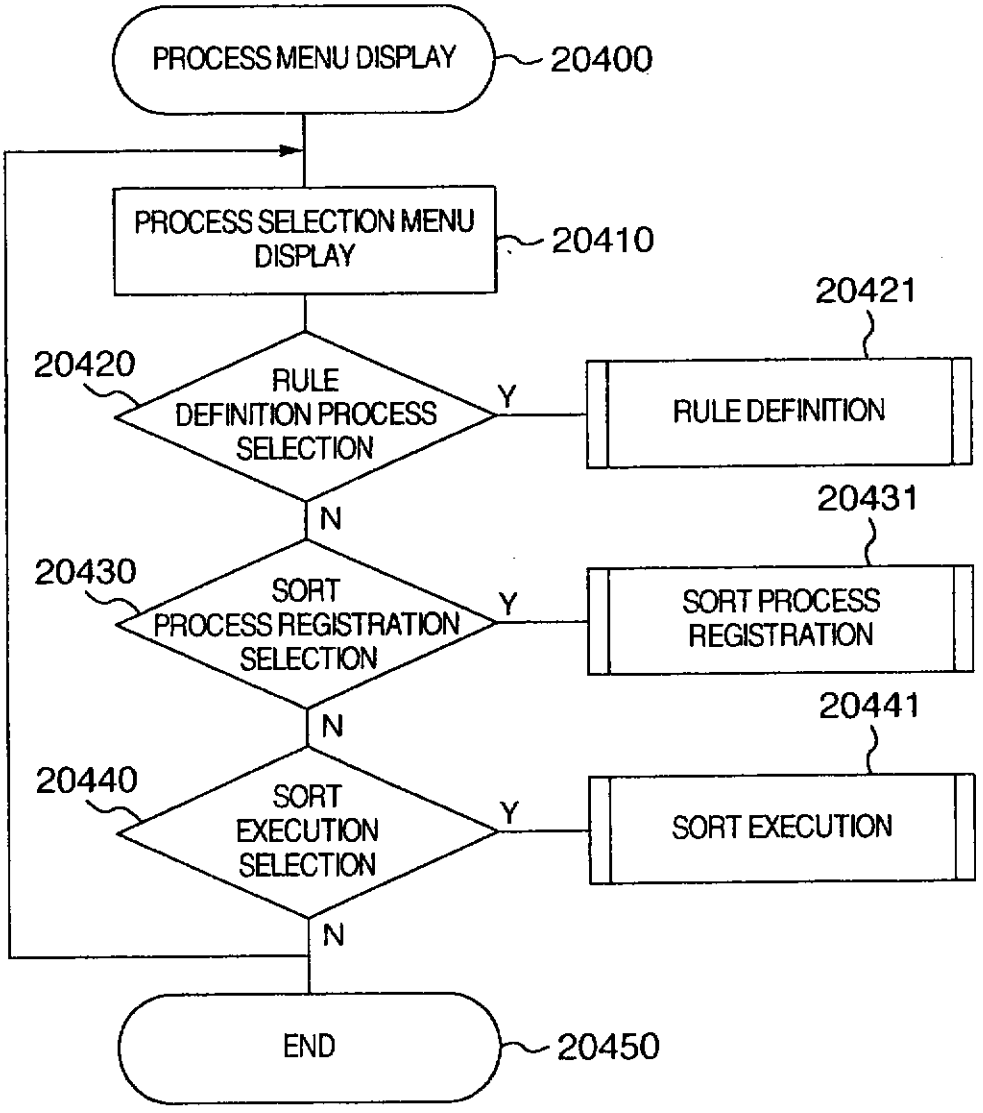

PROCESS MENU DISPLAY
20400
PROCESS SELECTION MENU DISPLAY
20410
20421
20420
RULE DEFINITION PROCESS SELECTION
Y
RULE DEFINITION
N
20431
20430
SORT PROCESS REGISTRATION SELECTION
Y
SORT PROCESS REGISTRATION
N
20441
20440
SORT EXECUTION SELECTION
Y
SORT EXECUTION
N
END
20450

FIG. 62

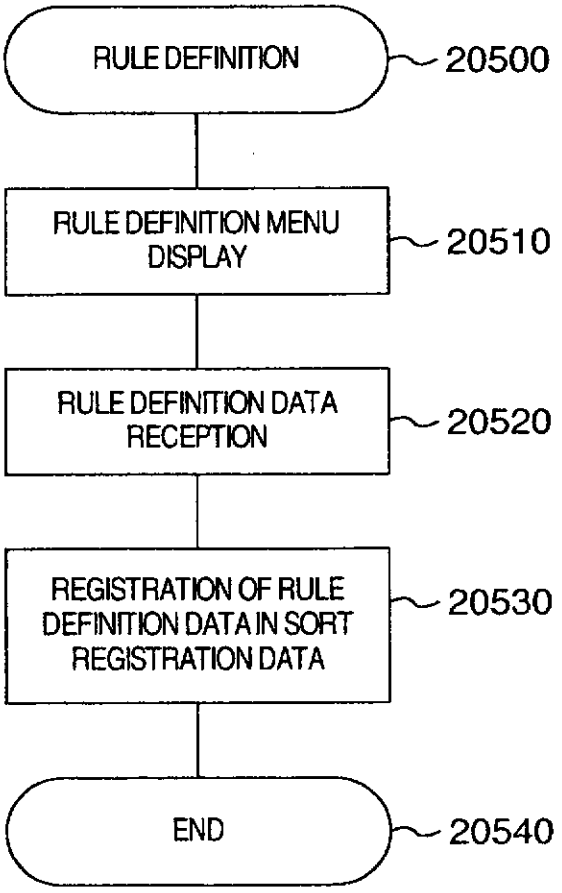

RULE DEFINITION
20500
RULE DEFINITION MENU DISPLAY
20510
RULE DEFINITION DATA RECEPTION
20520
REGISTRATION OF RULE DEFINITION DATA IN SORT REGISTRATION DATA
20530
END
20540

FIG. 63

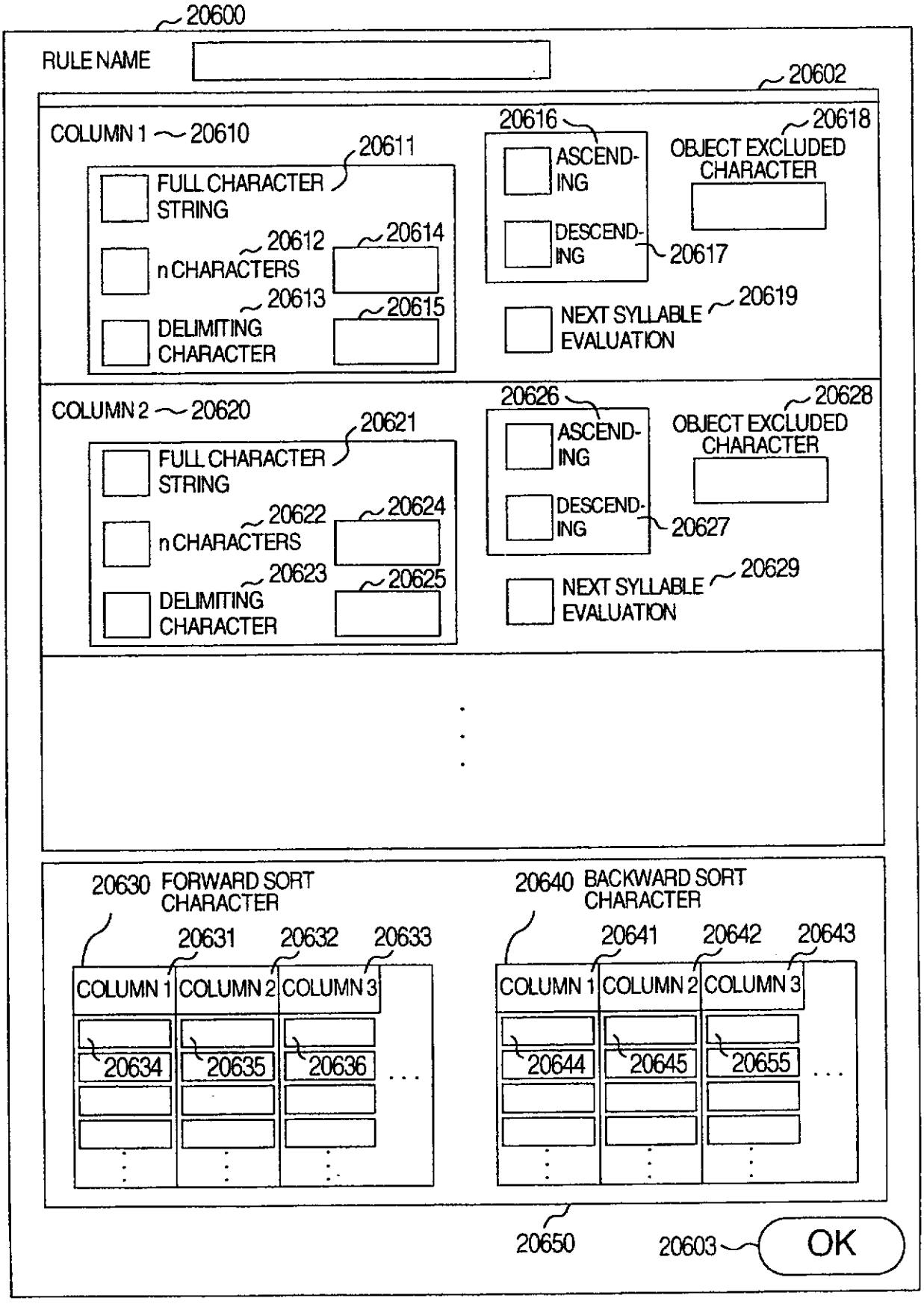

20600
RULE NAME
20602
COLUMN 1
20610
20611
FULL CHARACTER STRING
20612
n CHARACTERS
20614
20613
DELIMITING CHARACTER
20615
20616
ASCEND-ING
DESCEND-ING
20617
20618
OBJECT EXCLUDED CHARACTER
NEXT SYLLABLE EVALUATION
20619
COLUMN 2
20620
20621
FULL CHARACTER STRING
20622
n CHARACTERS
20624
20623
DELIMITING CHARACTER
20625
20626
ASCEND-ING
DESCEND-ING
20627
20628
OBJECT EXCLUDED CHARACTER
NEXT SYLLABLE EVALUATION
20629
20630 FORWARD SORT CHARACTER
20631
20632
20633
COLUMN 1
COLUMN 2
COLUMN 3
20634
20635
20636
20640 BACKWARD SORT CHARACTER
20641
20642
20643
COLUMN 1
COLUMN 2
COLUMN 3
20644
20645
20655
20650
20603
OK

FIG. 64

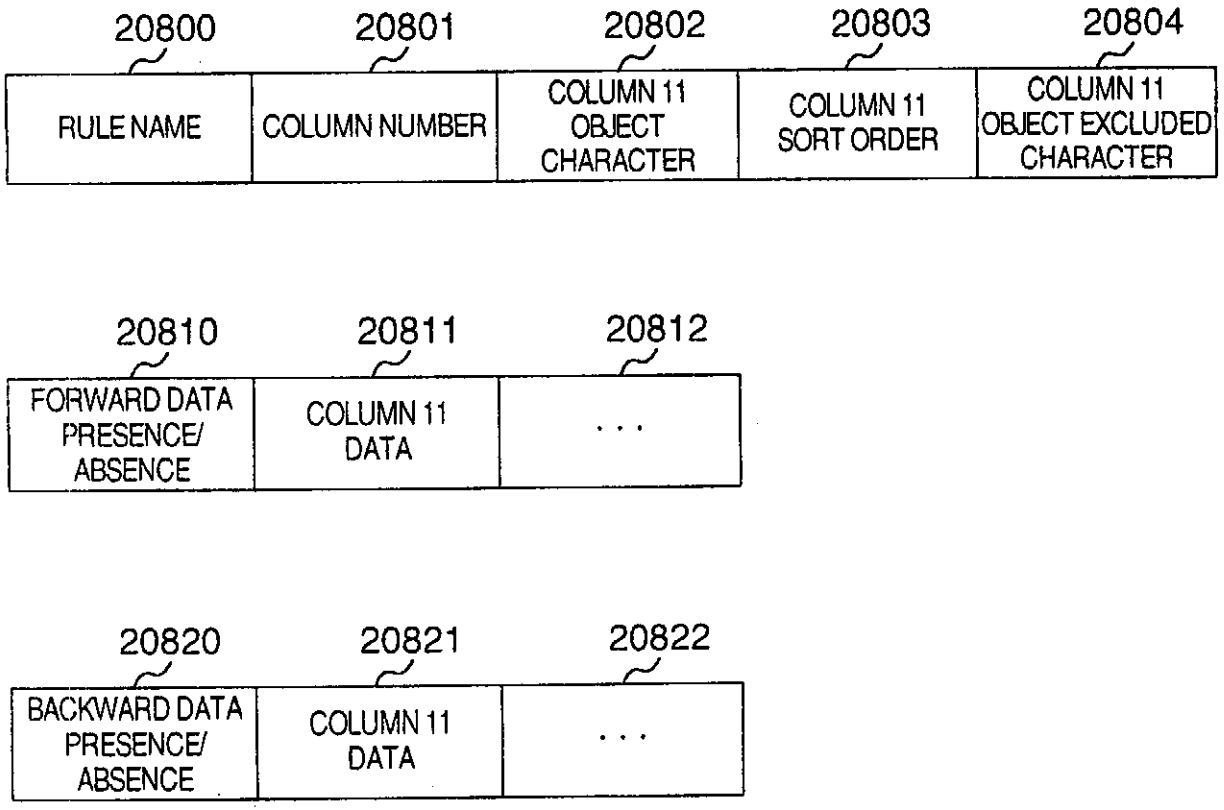
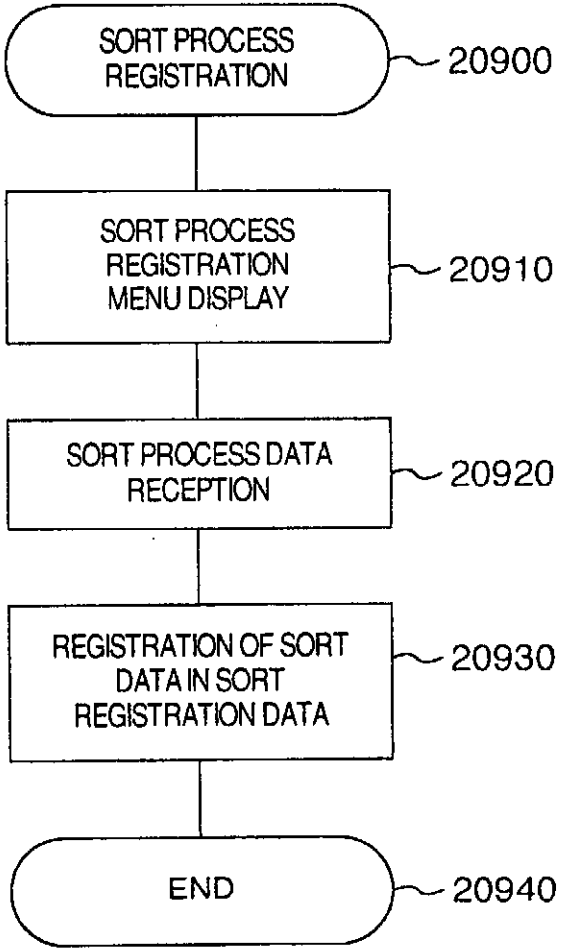


FIG. 65



30 APR 2004

FIG. 66

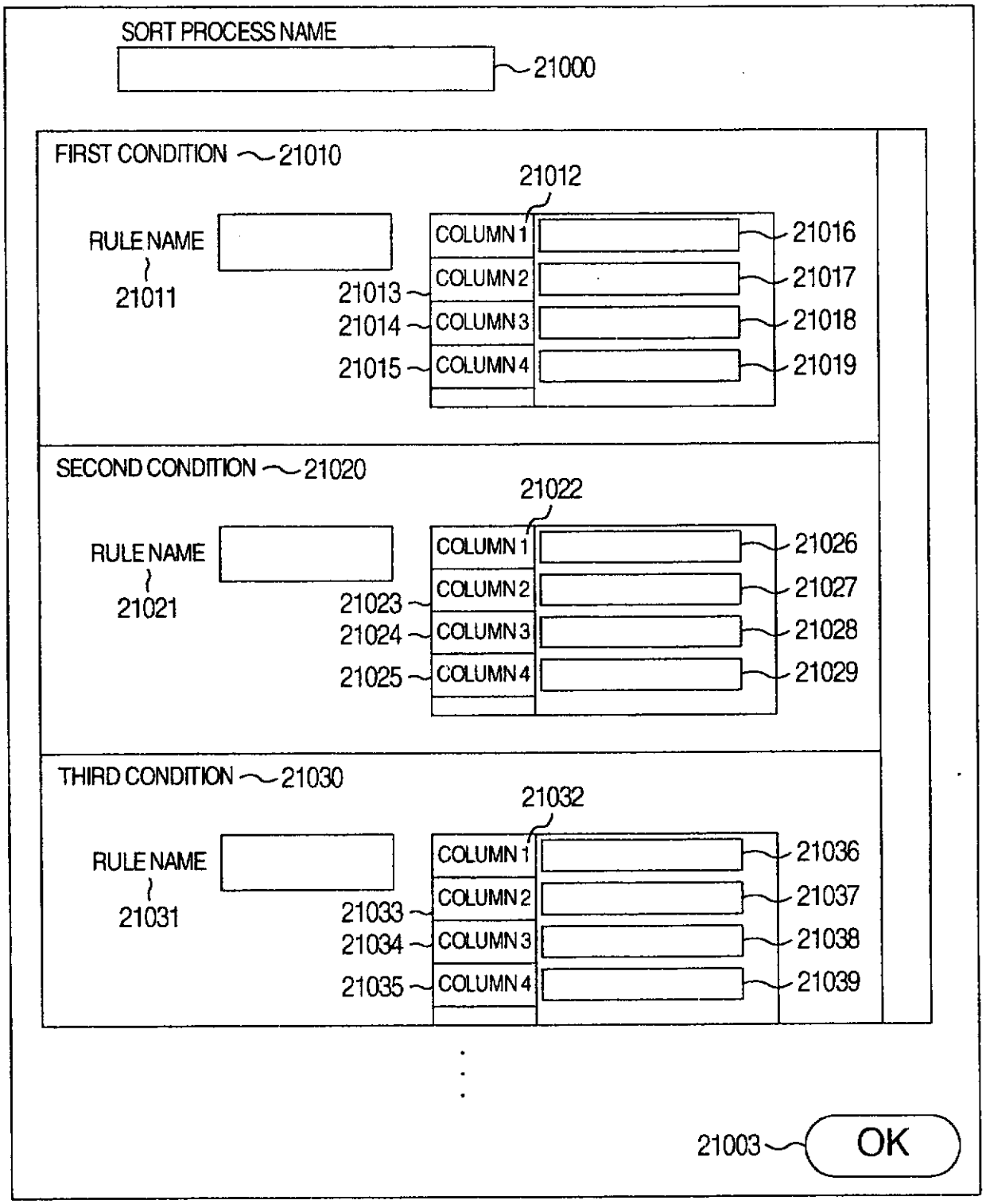


FIG. 67

21100 SORT PROCESS NAME	21101 CONDITION NUMBER	21102 CONDITION 1 RULE NAME	21103 CONDITION 1 COLUMN 1 NAME	21104 . . .

FIG. 68

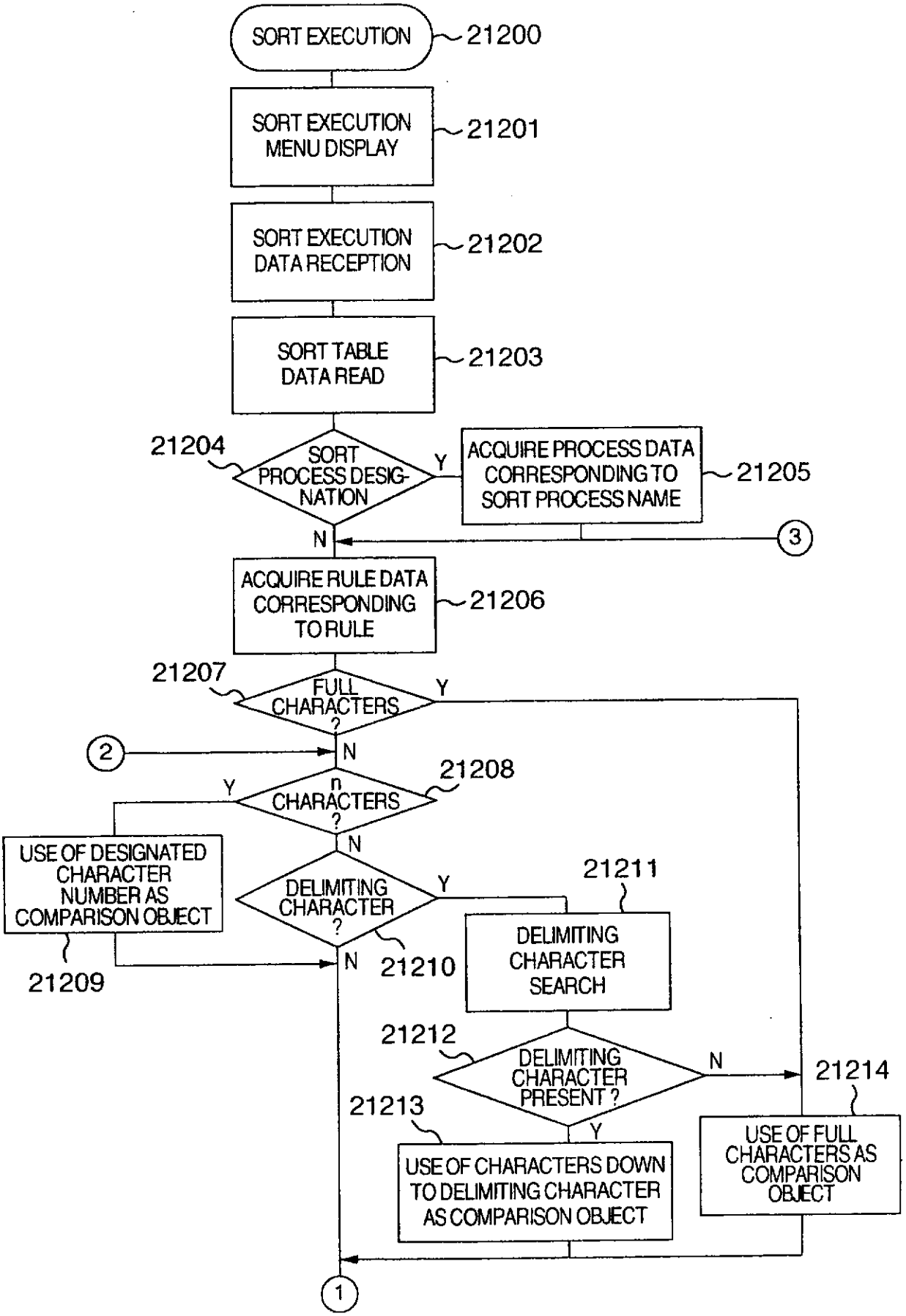

SORT EXECUTION
21200
SORT EXECUTION MENU DISPLAY
21201
SORT EXECUTION DATA RECEPTION
21202
SORT TABLE DATA READ
21203
21204
SORT PROCESS DESIGNATION
Y
ACQUIRE PROCESS DATA CORRESPONDING TO SORT PROCESS NAME
21205
N
3
ACQUIRE RULE DATA CORRESPONDING TO RULE
21206
21207
FULL CHARACTERS ?
Y
2
N
21208
n CHARACTERS ?
Y
N
USE OF DESIGNATED CHARACTER NUMBER AS COMPARISON OBJECT
21209
DELIMITING CHARACTER ?
Y
21211
N
21210
DELIMITING CHARACTER SEARCH
21212
DELIMITING CHARACTER PRESENT ?
N
21214
21213
Y
USE OF CHARACTERS DOWN TO DELIMITING CHARACTER AS COMPARISON OBJECT
USE OF FULL CHARACTERS AS COMPARISON OBJECT
1

FIG. 69

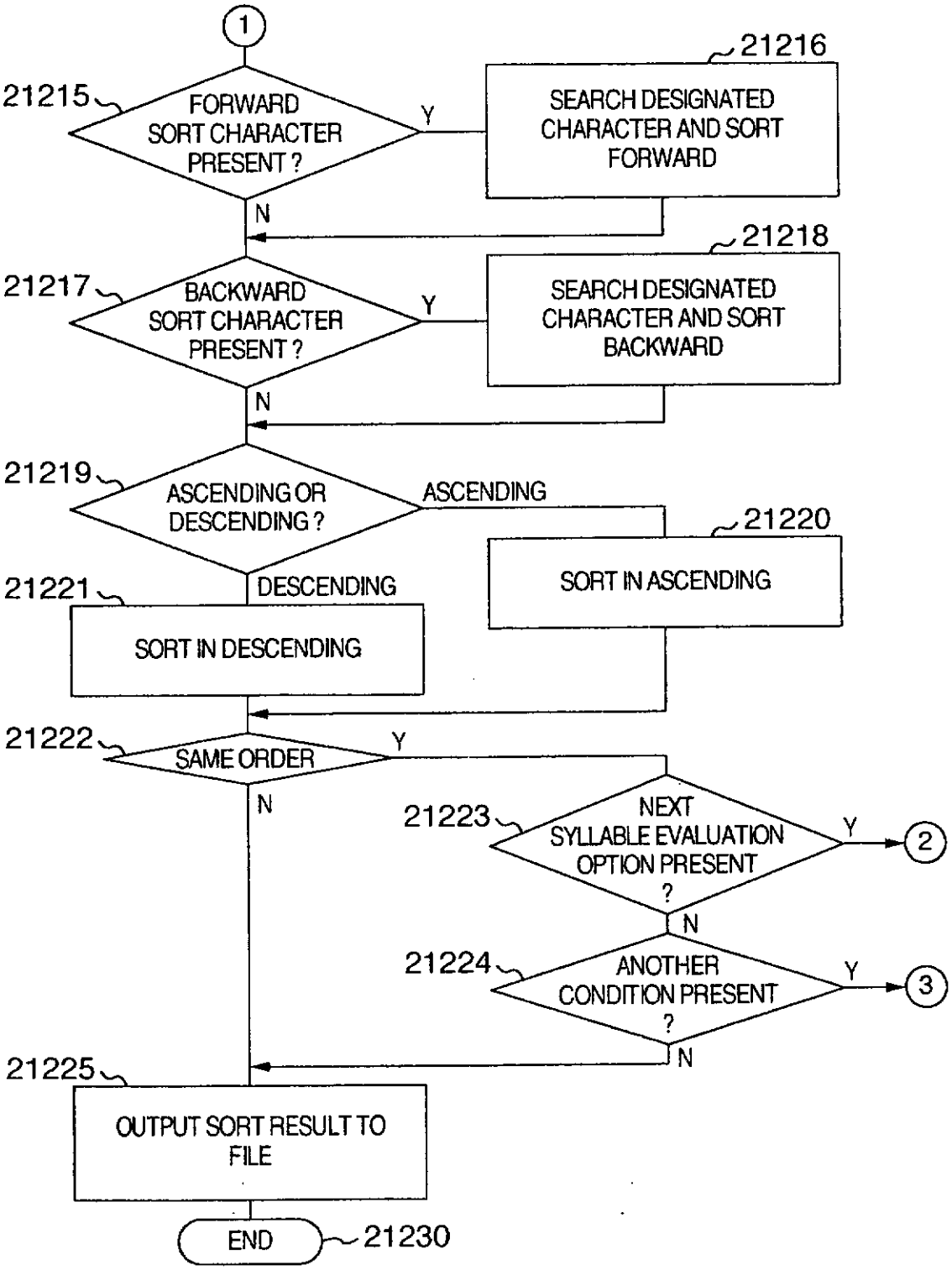

1
21215
FORWARD SORT CHARACTER PRESENT ?
Y
21216
SEARCH DESIGNATED CHARACTER AND SORT FORWARD
N
21217
BACKWARD SORT CHARACTER PRESENT ?
Y
21218
SEARCH DESIGNATED CHARACTER AND SORT BACKWARD
N
21219
ASCENDING OR DESCENDING ?
ASCENDING
21220
SORT IN ASCENDING
DESCENDING
21221
SORT IN DESCENDING
21222
SAME ORDER
Y
N
21223
NEXT SYLLABLE EVALUATION OPTION PRESENT ?
Y
2
N
21224
ANOTHER CONDITION PRESENT ?
Y
3
N
21225
OUTPUT SORT RESULT TO FILE
END
21230

FIG. 70

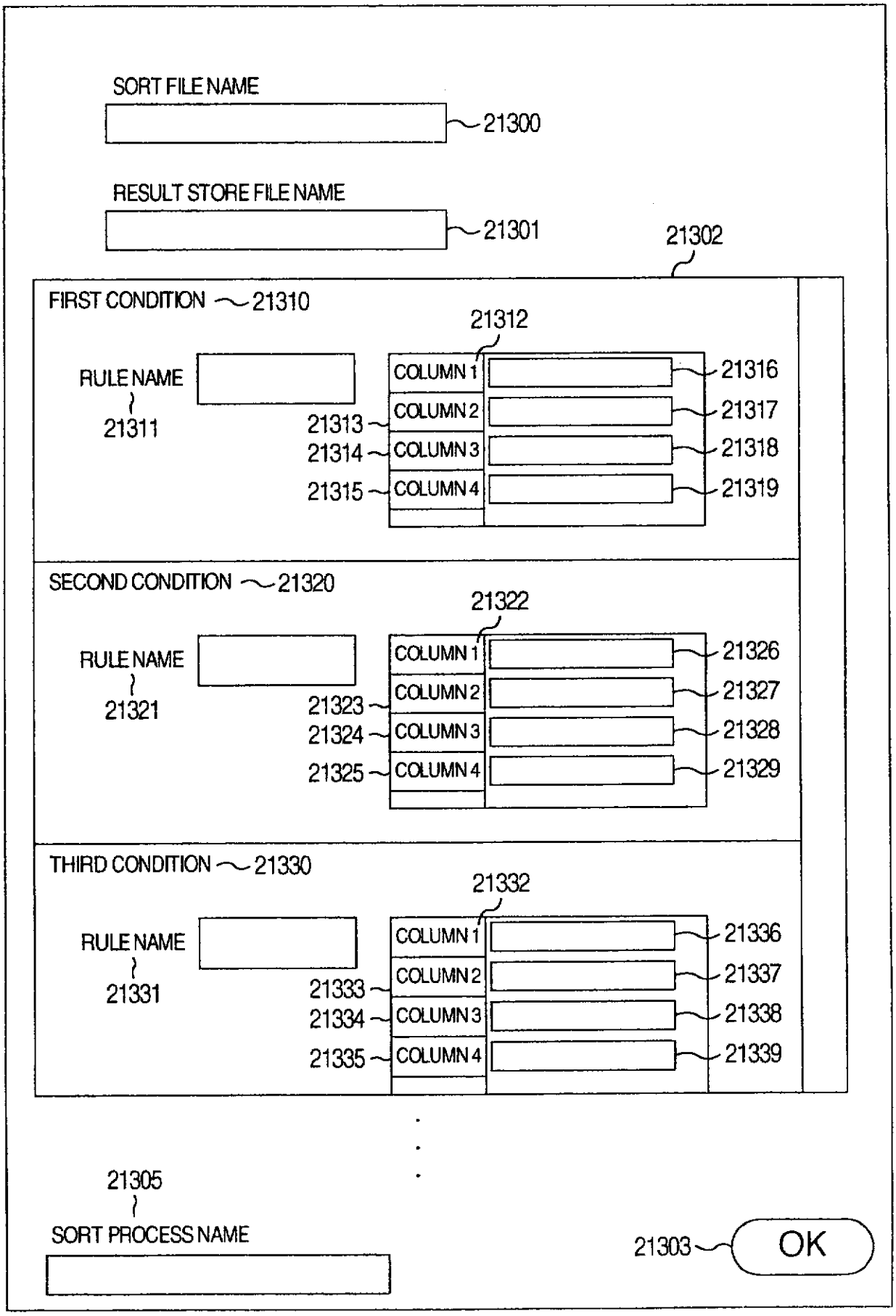

SORT FILE NAME
21300
RESULT STORE FILE NAME
21301
21302
FIRST CONDITION
21310
21312
RULE NAME
21311
COLUMN 1
COLUMN 2
COLUMN 3
COLUMN 4
21313
21314
21315
21316
21317
21318
21319
SECOND CONDITION
21320
21322
RULE NAME
21321
COLUMN 1
COLUMN 2
COLUMN 3
COLUMN 4
21323
21324
21325
21326
21327
21328
21329
THIRD CONDITION
21330
21332
RULE NAME
21331
COLUMN 1
COLUMN 2
COLUMN 3
COLUMN 4
21333
21334
21335
21336
21337
21338
21339
21305
SORT PROCESS NAME
21303
OK

FIG. 71

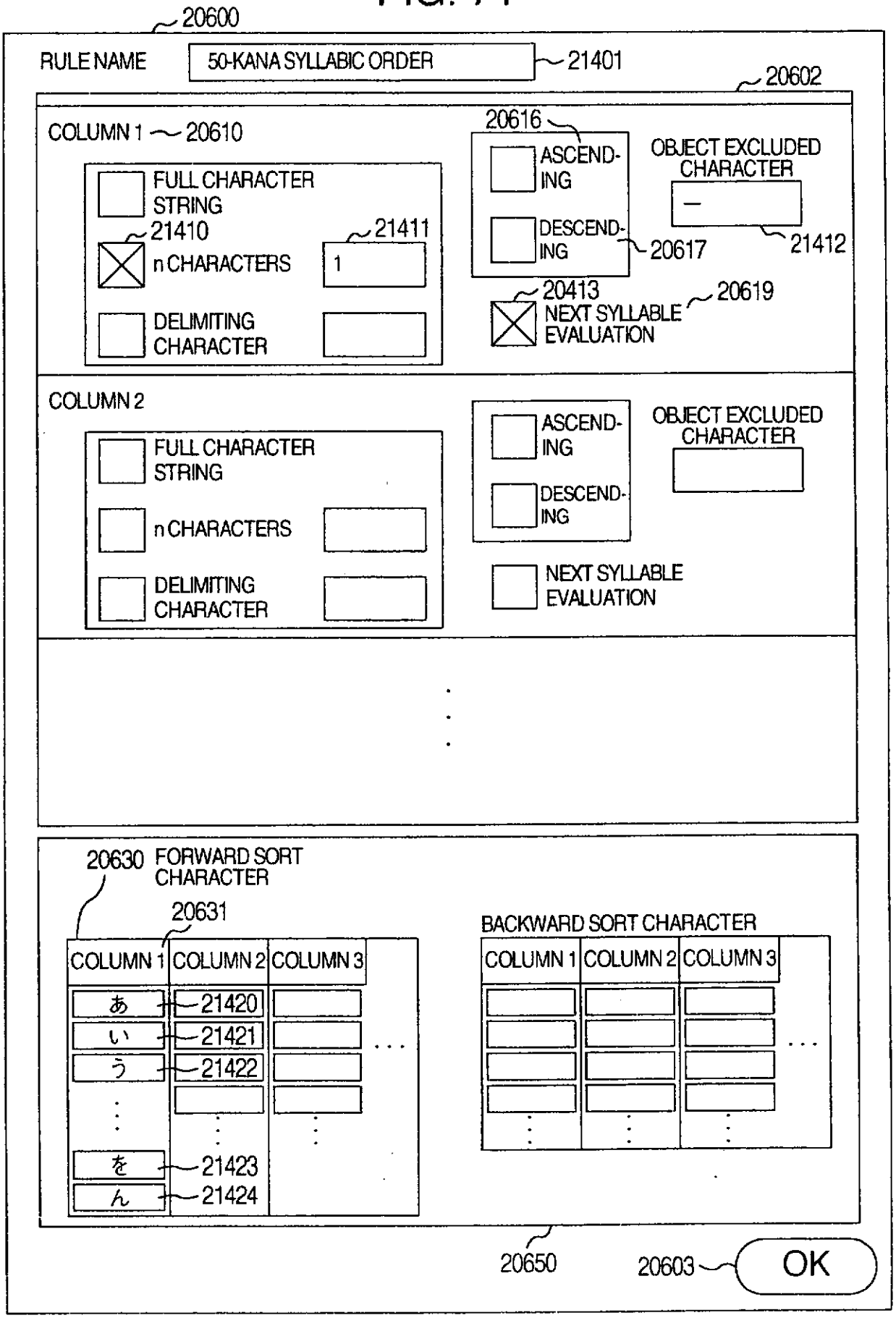

20600
RULE NAME
50-KANA SYLLABIC ORDER
21401
20602
COLUMN 1
20610
20616
ASCEND-ING
DESCEND-ING
OBJECT EXCLUDED CHARACTER
20617
21412
FULL CHARACTER STRING
21410
n CHARACTERS
21411
1
DELIMITING CHARACTER
20413
NEXT SYLLABLE EVALUATION
20619
COLUMN 2
FULL CHARACTER STRING
n CHARACTERS
DELIMITING CHARACTER
ASCEND-ING
DESCEND-ING
OBJECT EXCLUDED CHARACTER
NEXT SYLLABLE EVALUATION
20630
FORWARD SORT CHARACTER
20631
COLUMN 1
COLUMN 2
COLUMN 3
あ
い
う
を
ん
21420
21421
21422
21423
21424
BACKWARD SORT CHARACTER
COLUMN 1
COLUMN 2
COLUMN 3
20650
20603
OK

FIG. 72

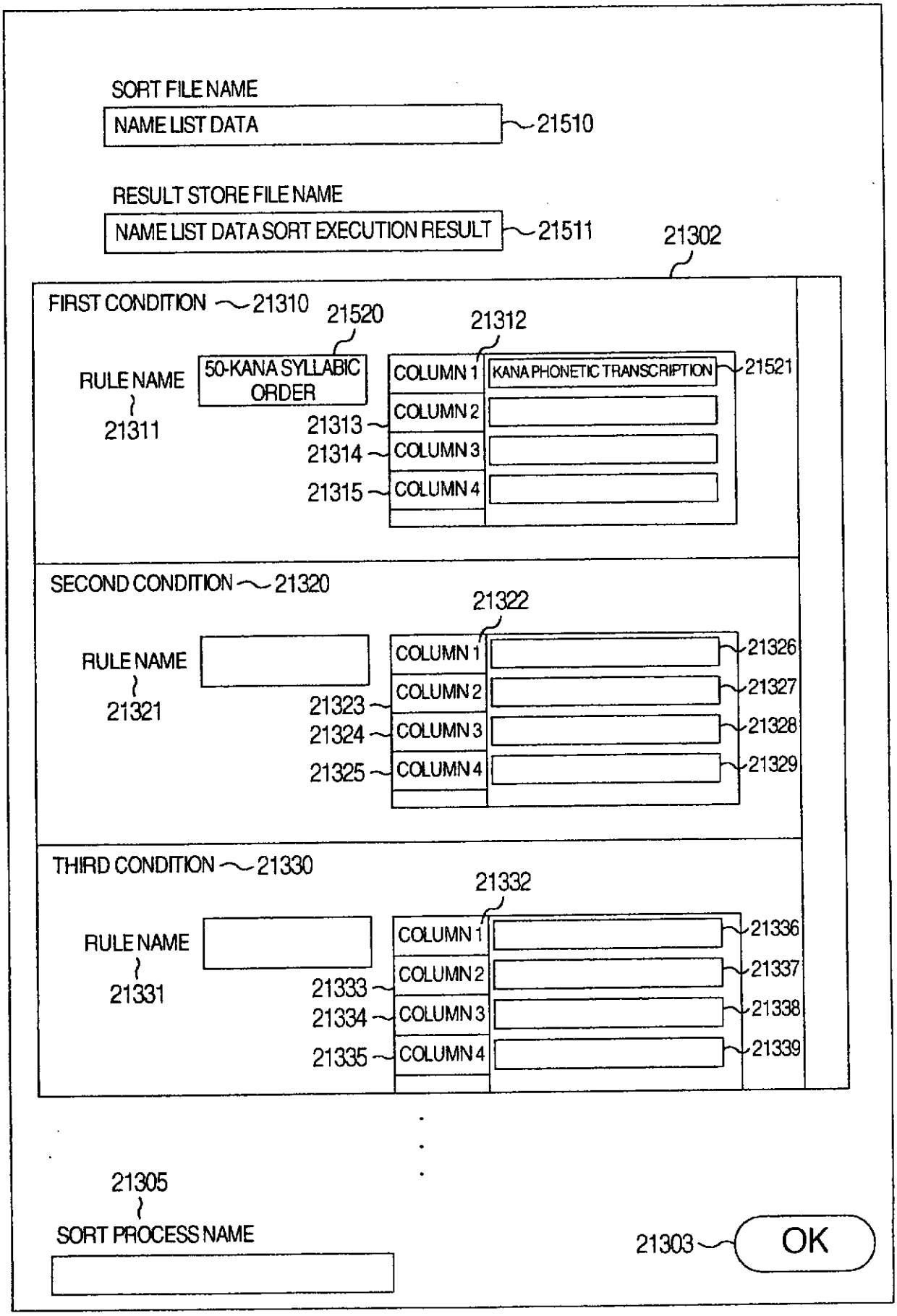

SORT FILE NAME
NAME LIST DATA
21510
RESULT STORE FILE NAME
NAME LIST DATA SORT EXECUTION RESULT
21511
21302
FIRST CONDITION
21310
21520
21312
RULE NAME
21311
50-KANA SYLLABIC ORDER
COLUMN 1
KANA PHONETIC TRANSCRIPTION
21521
21313
COLUMN 2
21314
COLUMN 3
21315
COLUMN 4
SECOND CONDITION
21320
21322
RULE NAME
21321
COLUMN 1
21326
21323
COLUMN 2
21327
21324
COLUMN 3
21328
21325
COLUMN 4
21329
THIRD CONDITION
21330
21332
RULE NAME
21331
COLUMN 1
21336
21333
COLUMN 2
21337
21334
COLUMN 3
21338
21335
COLUMN 4
21339
21305
SORT PROCESS NAME
21303
OK

FIG. 73

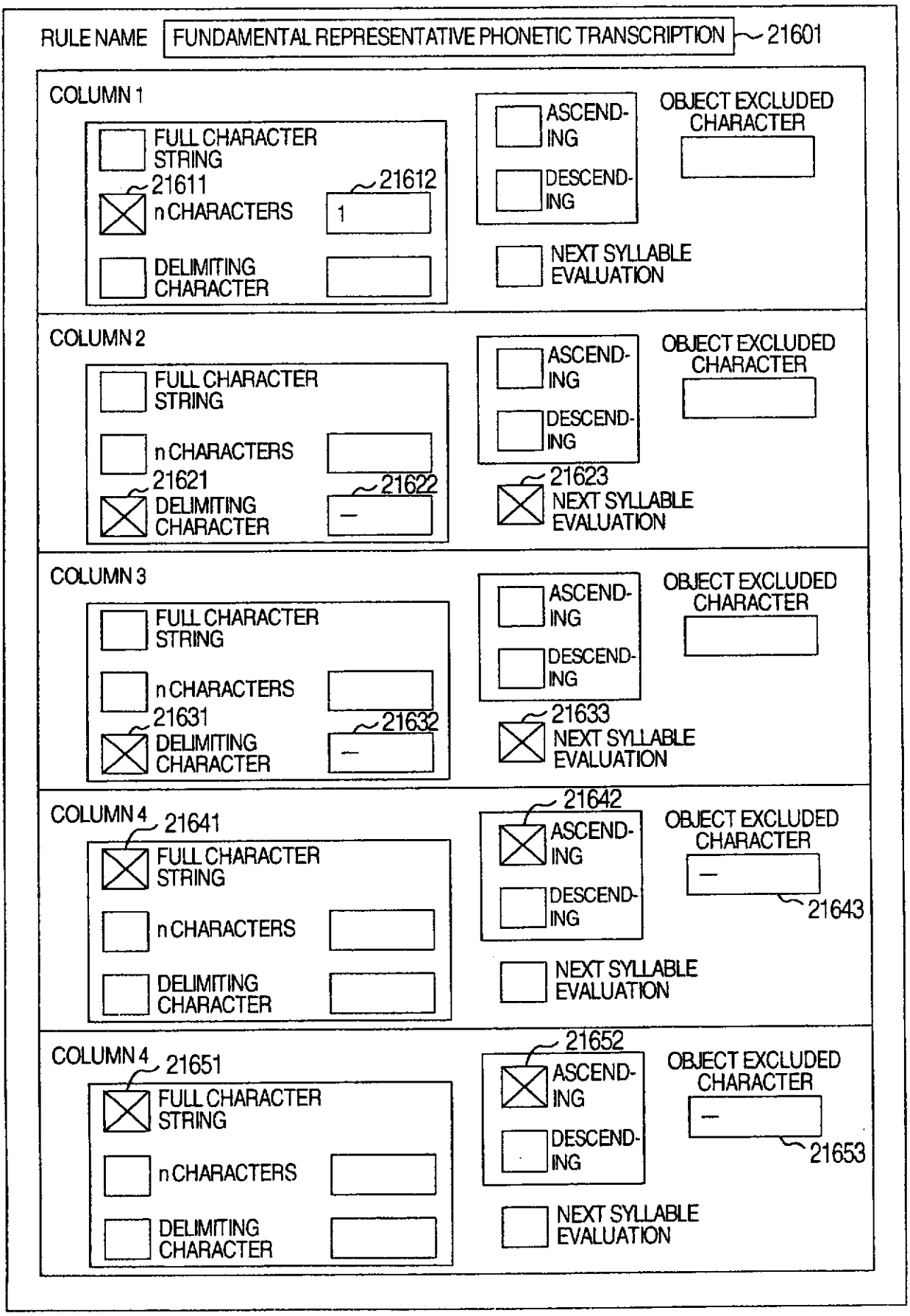

RULE NAME
FUNDAMENTAL REPRESENTATIVE PHONETIC TRANSCRIPTION
21601
COLUMN 1
FULL CHARACTER STRING
21611
n CHARACTERS
21612
1
DELIMITING CHARACTER
ASCEND-ING
DESCEND-ING
OBJECT EXCLUDED CHARACTER
NEXT SYLLABLE EVALUATION
COLUMN 2
FULL CHARACTER STRING
n CHARACTERS
21621
DELIMITING CHARACTER
21622
—
ASCEND-ING
DESCEND-ING
OBJECT EXCLUDED CHARACTER
21623
NEXT SYLLABLE EVALUATION
COLUMN 3
FULL CHARACTER STRING
n CHARACTERS
21631
DELIMITING CHARACTER
21632
—
ASCEND-ING
DESCEND-ING
OBJECT EXCLUDED CHARACTER
21633
NEXT SYLLABLE EVALUATION
COLUMN 4
21641
FULL CHARACTER STRING
n CHARACTERS
DELIMITING CHARACTER
21642
ASCEND-ING
DESCEND-ING
OBJECT EXCLUDED CHARACTER
—
21643
NEXT SYLLABLE EVALUATION
COLUMN 4
21651
FULL CHARACTER STRING
n CHARACTERS
DELIMITING CHARACTER
21652
ASCEND-ING
DESCEND-ING
OBJECT EXCLUDED CHARACTER
—
21653
NEXT SYLLABLE EVALUATION

FIG. 74

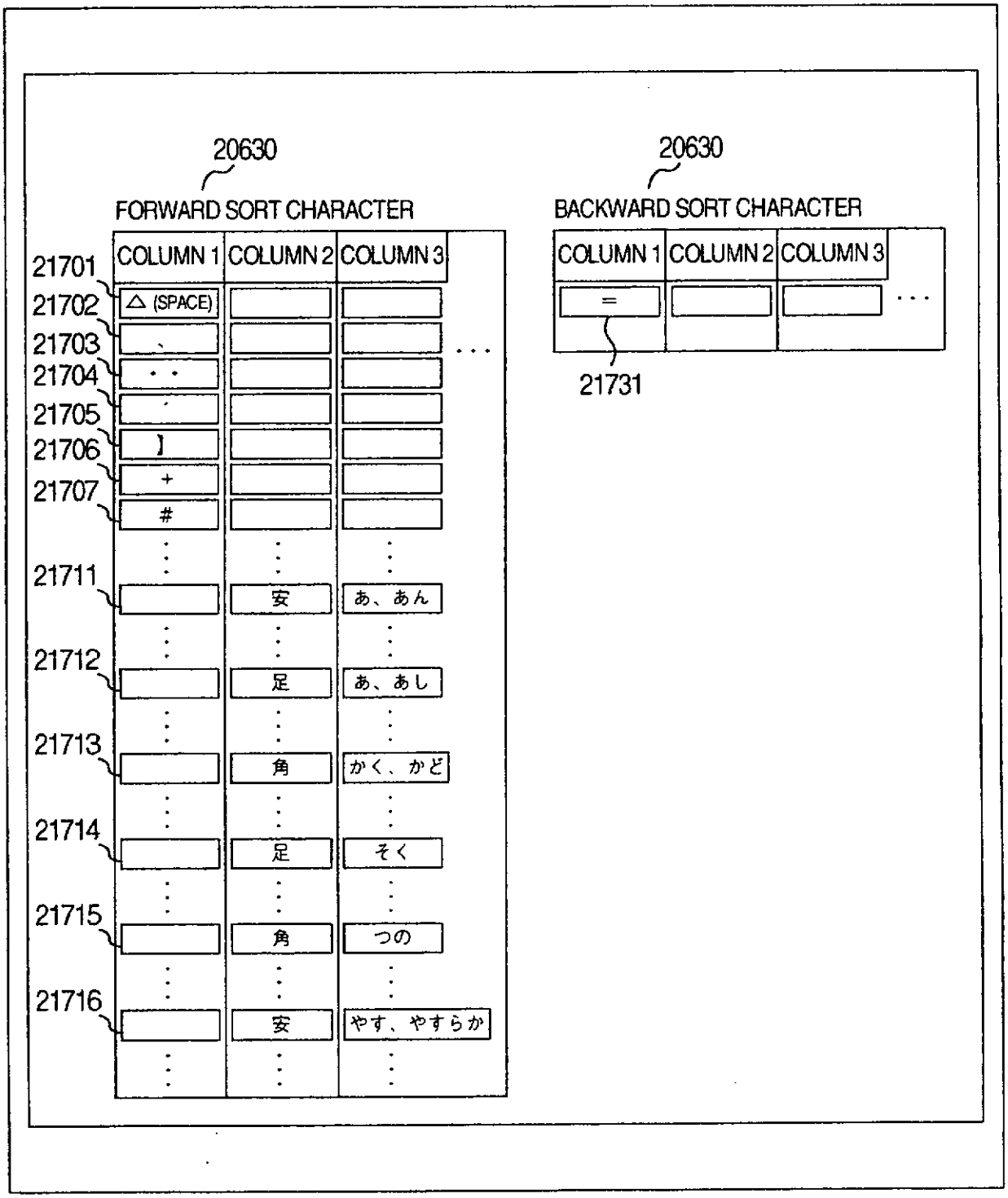

20630
FORWARD SORT CHARACTER
COLUMN 1
COLUMN 2
COLUMN 3
21701
21702
21703
21704
21705
21706
21707
21711
21712
21713
21714
21715
21716
△ (SPACE)
、
・・
・
」
+
#
安
あ、あん
足
あ、あし
角
かく、かど
足
そく
角
つの
安
やす、やすらか
20630
BACKWARD SORT CHARACTER
COLUMN 1
COLUMN 2
COLUMN 3
=
21731

FIG. 75

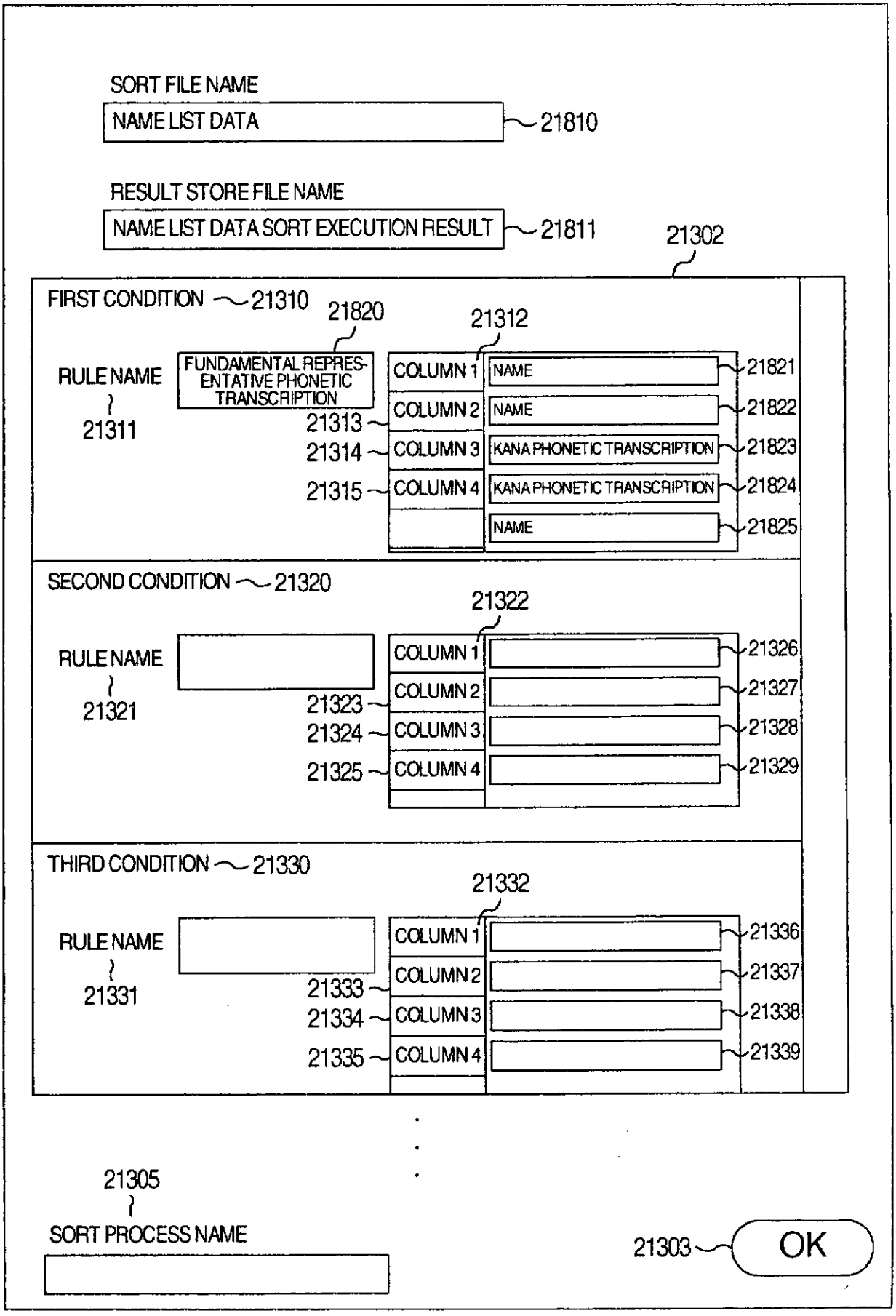

SORT FILE NAME
NAME LIST DATA
21810
RESULT STORE FILE NAME
NAME LIST DATA SORT EXECUTION RESULT
21811
21302
FIRST CONDITION
21310
21820
21312
RULE NAME
21311
FUNDAMENTAL REPRESENTATIVE PHONETIC TRANSCRIPTION
21313
21314
21315
COLUMN 1
NAME
21821
COLUMN 2
NAME
21822
COLUMN 3
KANA PHONETIC TRANSCRIPTION
21823
COLUMN 4
KANA PHONETIC TRANSCRIPTION
21824
NAME
21825
SECOND CONDITION
21320
21322
RULE NAME
21321
21323
21324
21325
COLUMN 1
21326
COLUMN 2
21327
COLUMN 3
21328
COLUMN 4
21329
THIRD CONDITION
21330
21332
RULE NAME
21331
21333
21334
21335
COLUMN 1
21336
COLUMN 2
21337
COLUMN 3
21338
COLUMN 4
21339
21305
SORT PROCESS NAME
21303
OK

FIG. 76

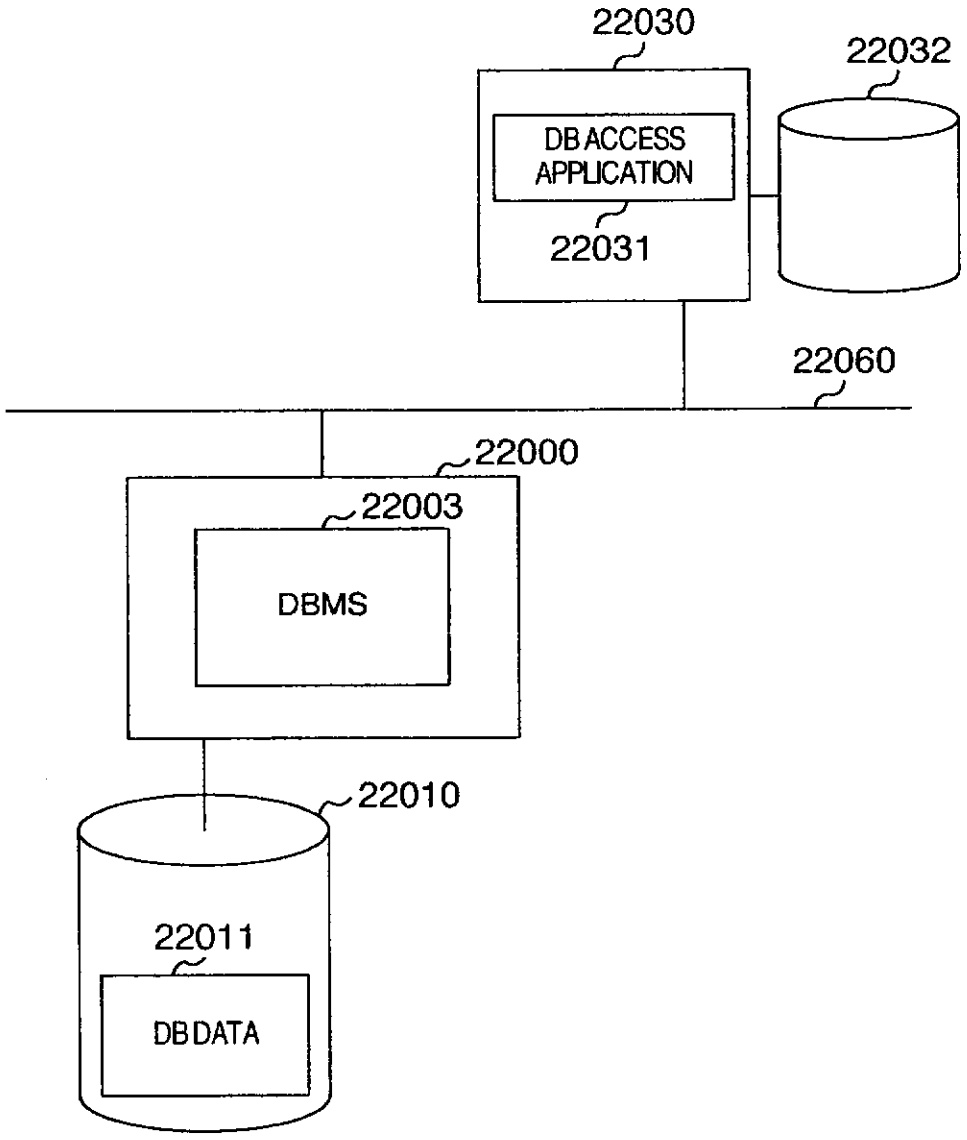

22030
22032
DB ACCESS APPLICATION
22031
22060
22000
22003
DBMS
22010
22011
DB DATA

FIG. 77

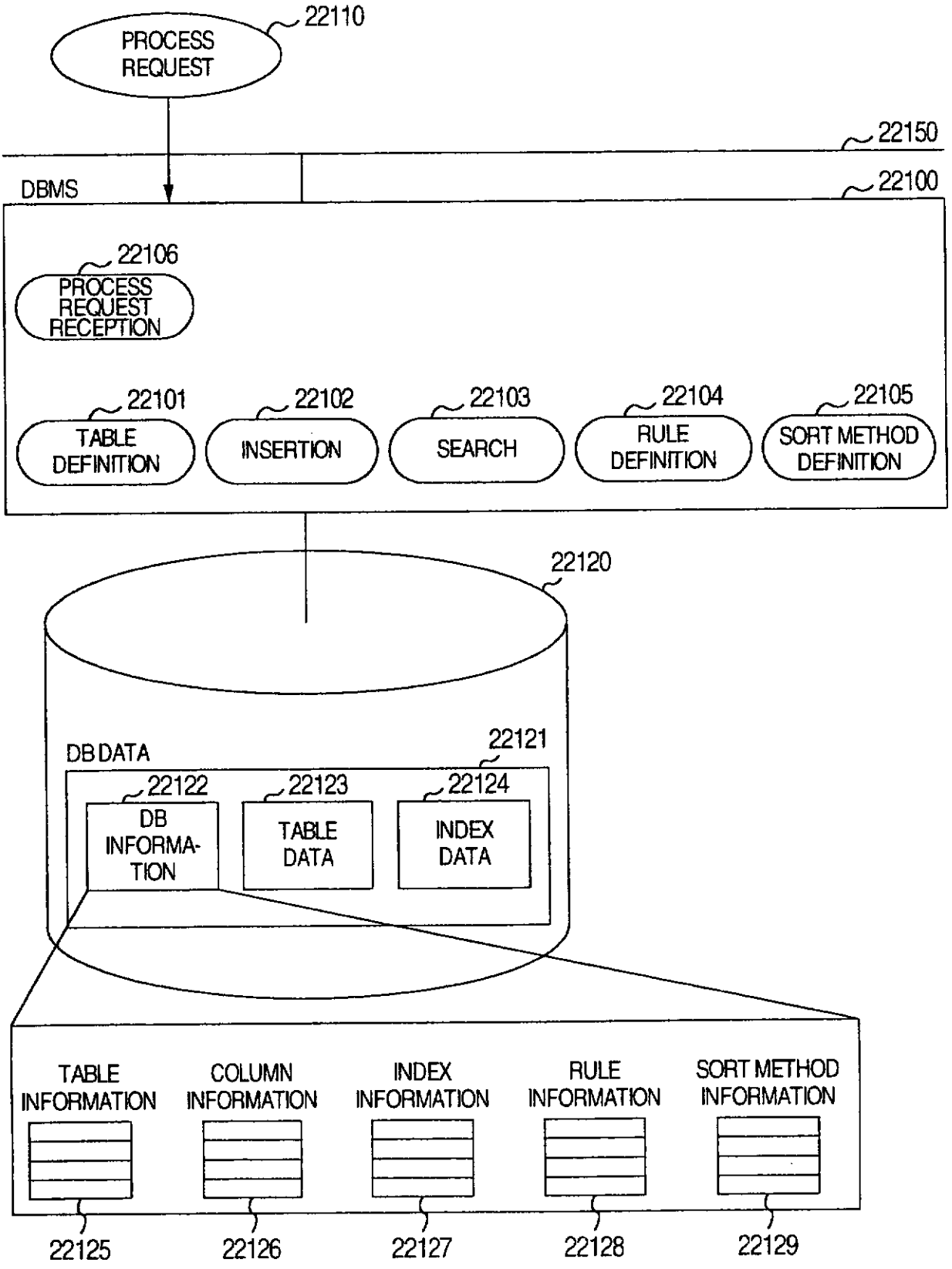

22110
PROCESS REQUEST
22150
DBMS
22100
22106
PROCESS REQUEST RECEPTION
22101
TABLE DEFINITION
22102
INSERTION
22103
SEARCH
22104
RULE DEFINITION
22105
SORT METHOD DEFINITION
22120
DB DATA
22121
22122
DB INFORMA-TION
22123
TABLE DATA
22124
INDEX DATA
TABLE INFORMATION
COLUMN INFORMATION
INDEX INFORMATION
RULE INFORMATION
SORT METHOD INFORMATION
22125
22126
22127
22128
22129

FIG. 78

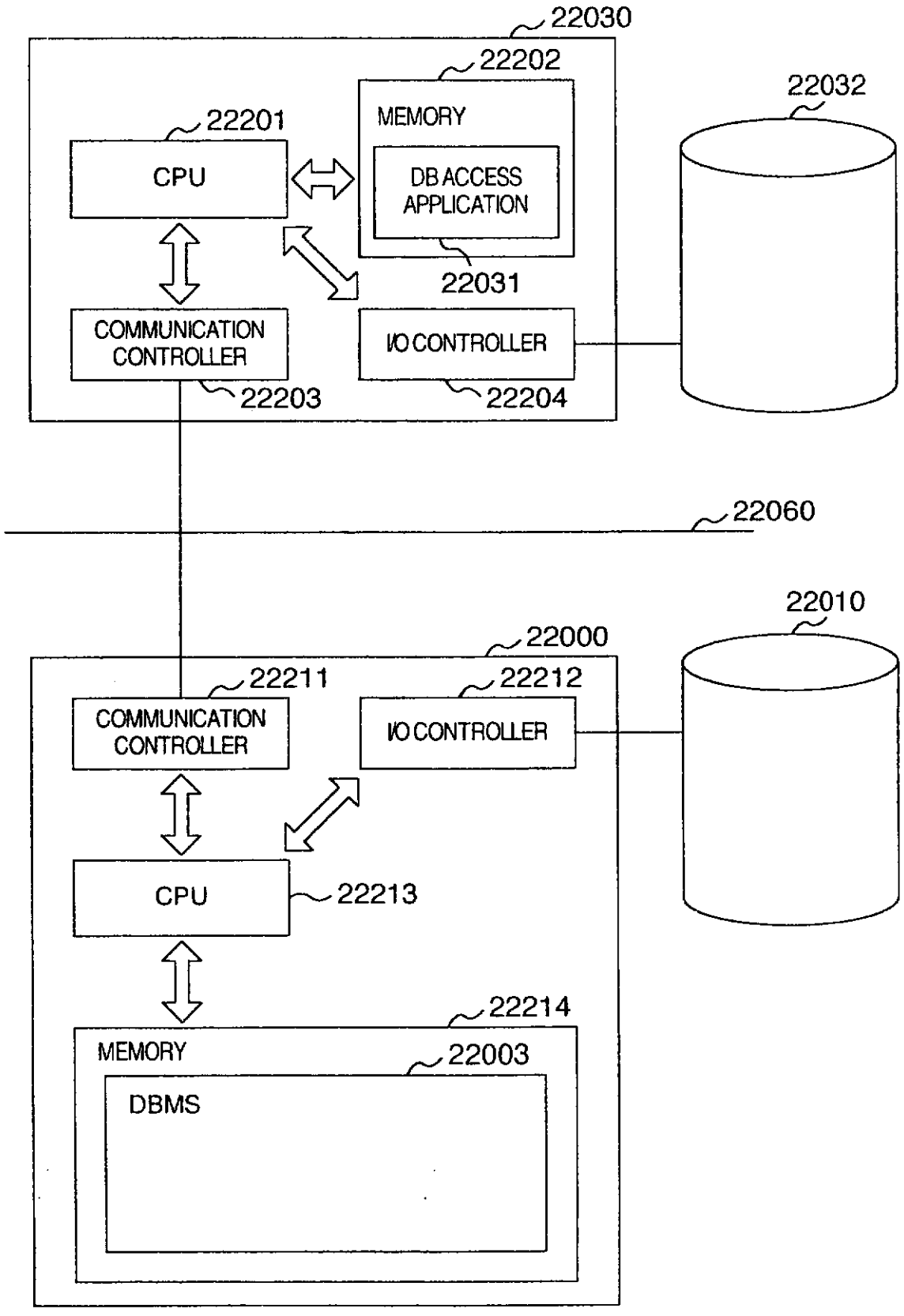

22030
22202
MEMORY
22032
22201
CPU
DB ACCESS APPLICATION
22031
COMMUNICATION CONTROLLER
I/O CONTROLLER
22203
22204
22060
22010
22000
22211
22212
COMMUNICATION CONTROLLER
I/O CONTROLLER
CPU
22213
22214
MEMORY
22003
DBMS

FIG. 79

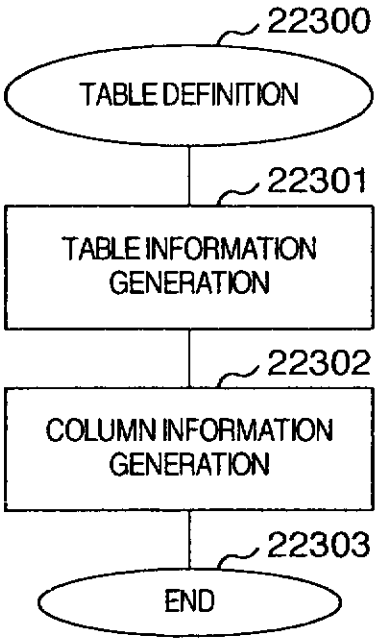

22300
TABLE DEFINITION
22301
TABLE INFORMATION GENERATION
22302
COLUMN INFORMATION GENERATION
22303
END

FIG. 80

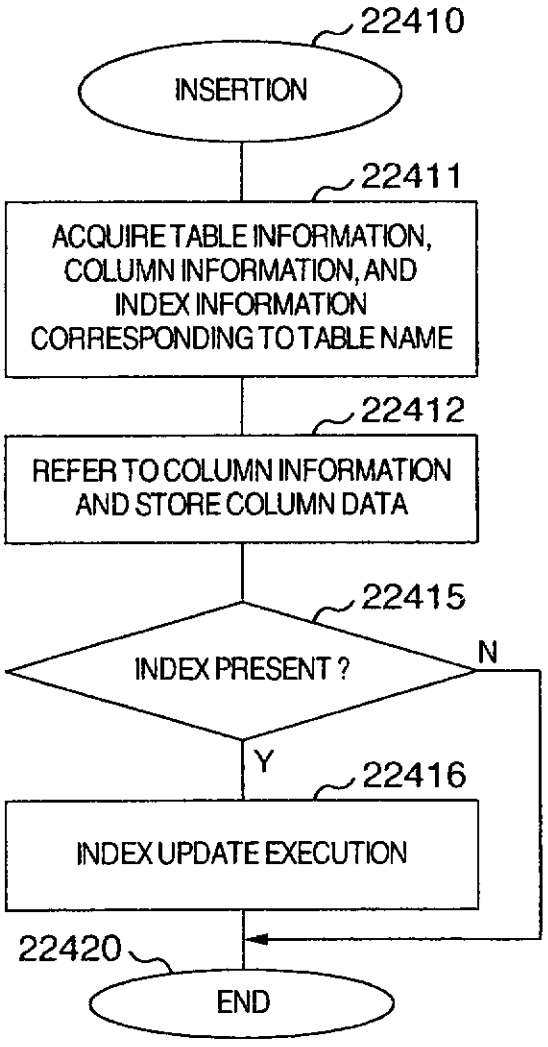

22410
INSERTION
22411
ACQUIRE TABLE INFORMATION, COLUMN INFORMATION, AND INDEX INFORMATION CORRESPONDING TO TABLE NAME
22412
REFER TO COLUMN INFORMATION AND STORE COLUMN DATA
22415
INDEX PRESENT ?
N
Y
22416
INDEX UPDATE EXECUTION
22420
END

FIG. 81

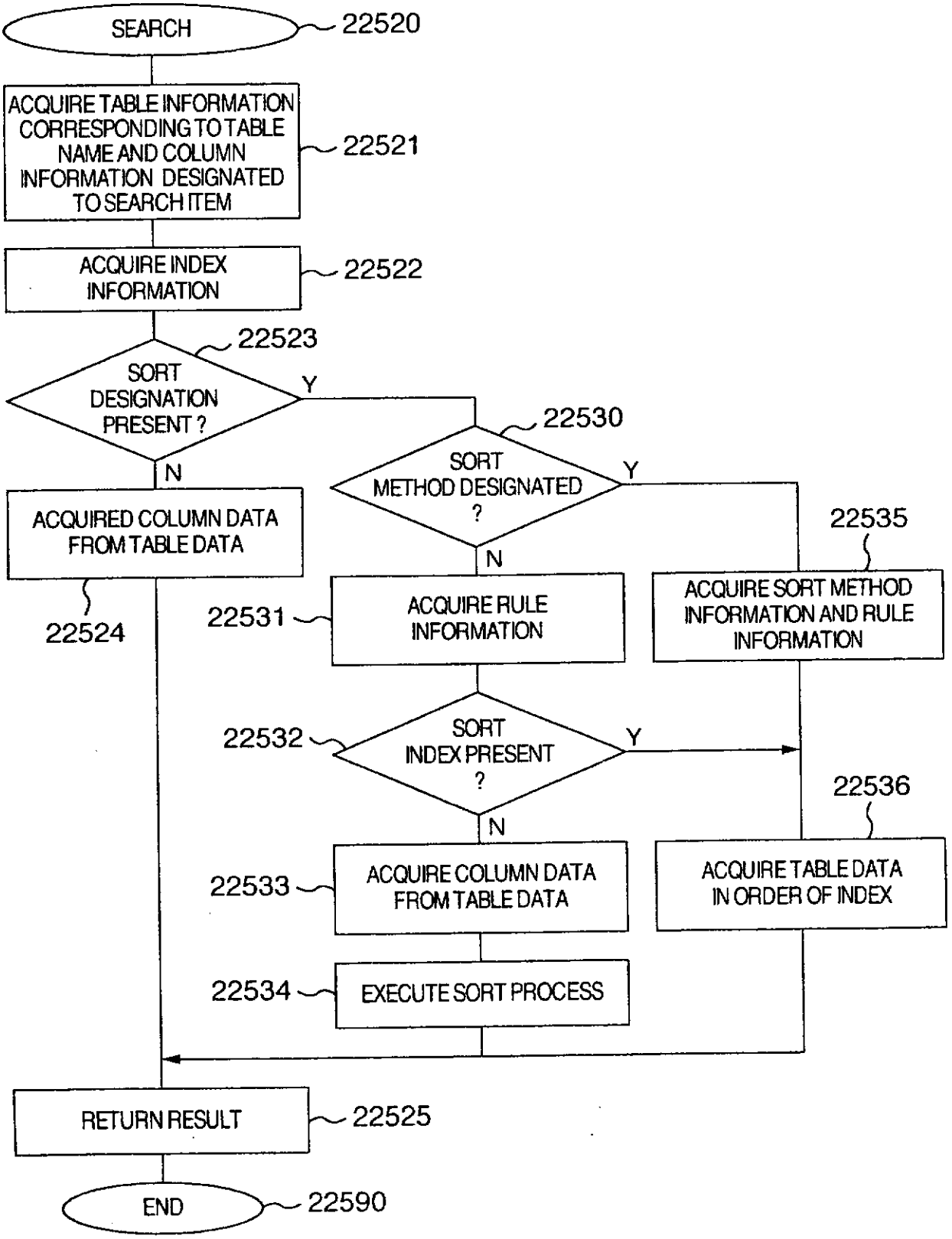

SEARCH
22520
ACQUIRE TABLE INFORMATION CORRESPONDING TO TABLE NAME AND COLUMN INFORMATION DESIGNATED TO SEARCH ITEM
22521
ACQUIRE INDEX INFORMATION
22522
22523
SORT DESIGNATION PRESENT ?
Y
N
22530
SORT METHOD DESIGNATED ?
Y
N
22535
ACQUIRED COLUMN DATA FROM TABLE DATA
22524
22531
ACQUIRE RULE INFORMATION
ACQUIRE SORT METHOD INFORMATION AND RULE INFORMATION
22532
SORT INDEX PRESENT ?
Y
N
22536
22533
ACQUIRE COLUMN DATA FROM TABLE DATA
ACQUIRE TABLE DATA IN ORDER OF INDEX
22534
EXECUTE SORT PROCESS
RETURN RESULT
22525
END
22590

FIG. 82

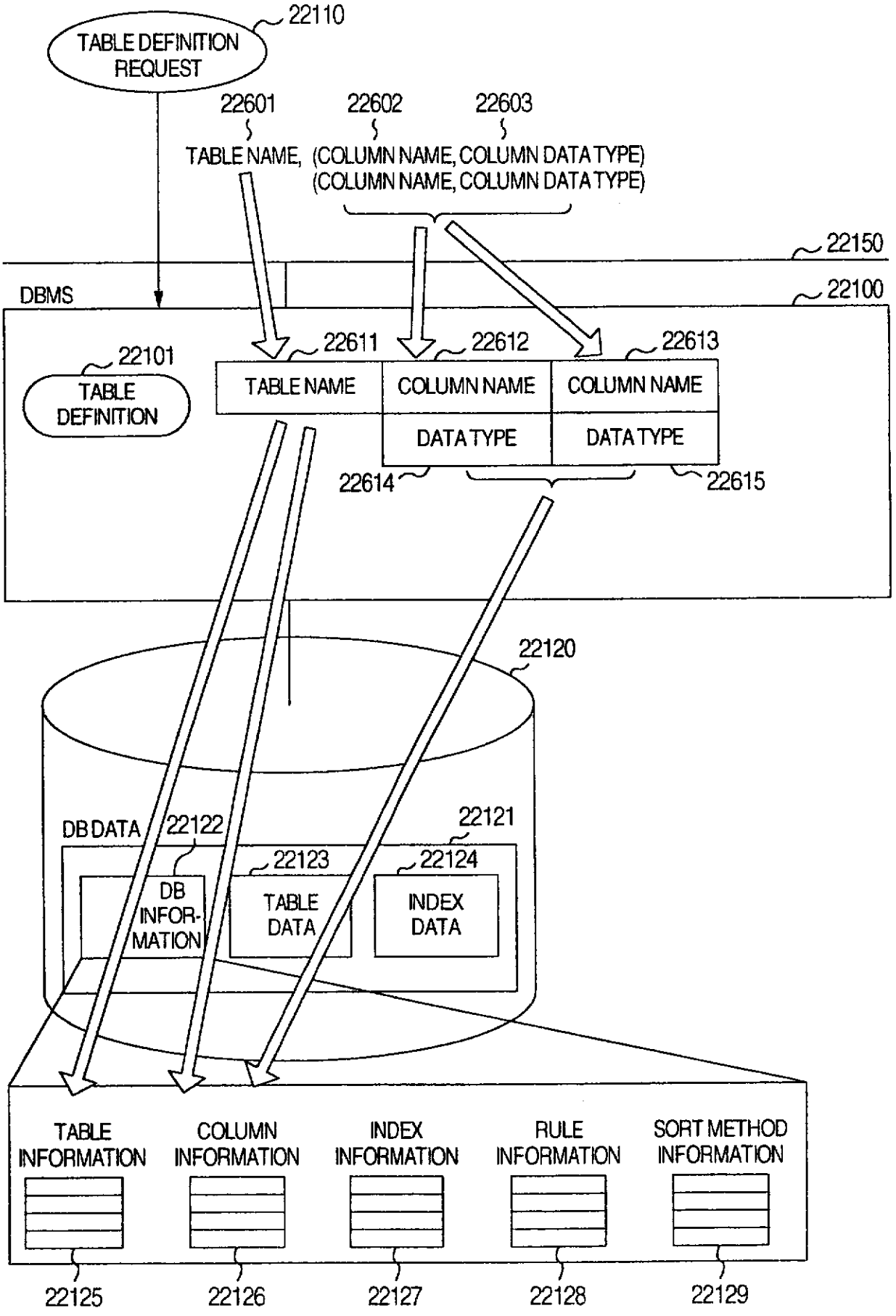

22110
TABLE DEFINITION REQUEST
22601
22602
22603
TABLE NAME, (COLUMN NAME, COLUMN DATA TYPE)
(COLUMN NAME, COLUMN DATA TYPE)
22150
DBMS
22100
22101
TABLE DEFINITION
22611
22612
22613
TABLE NAME
COLUMN NAME
COLUMN NAME
DATA TYPE
DATA TYPE
22614
22615
22120
DB DATA
22122
22121
22123
22124
DB INFOR-MATION
TABLE DATA
INDEX DATA
TABLE INFORMATION
COLUMN INFORMATION
INDEX INFORMATION
RULE INFORMATION
SORT METHOD INFORMATION
22125
22126
22127
22128
22129

FIG. 83

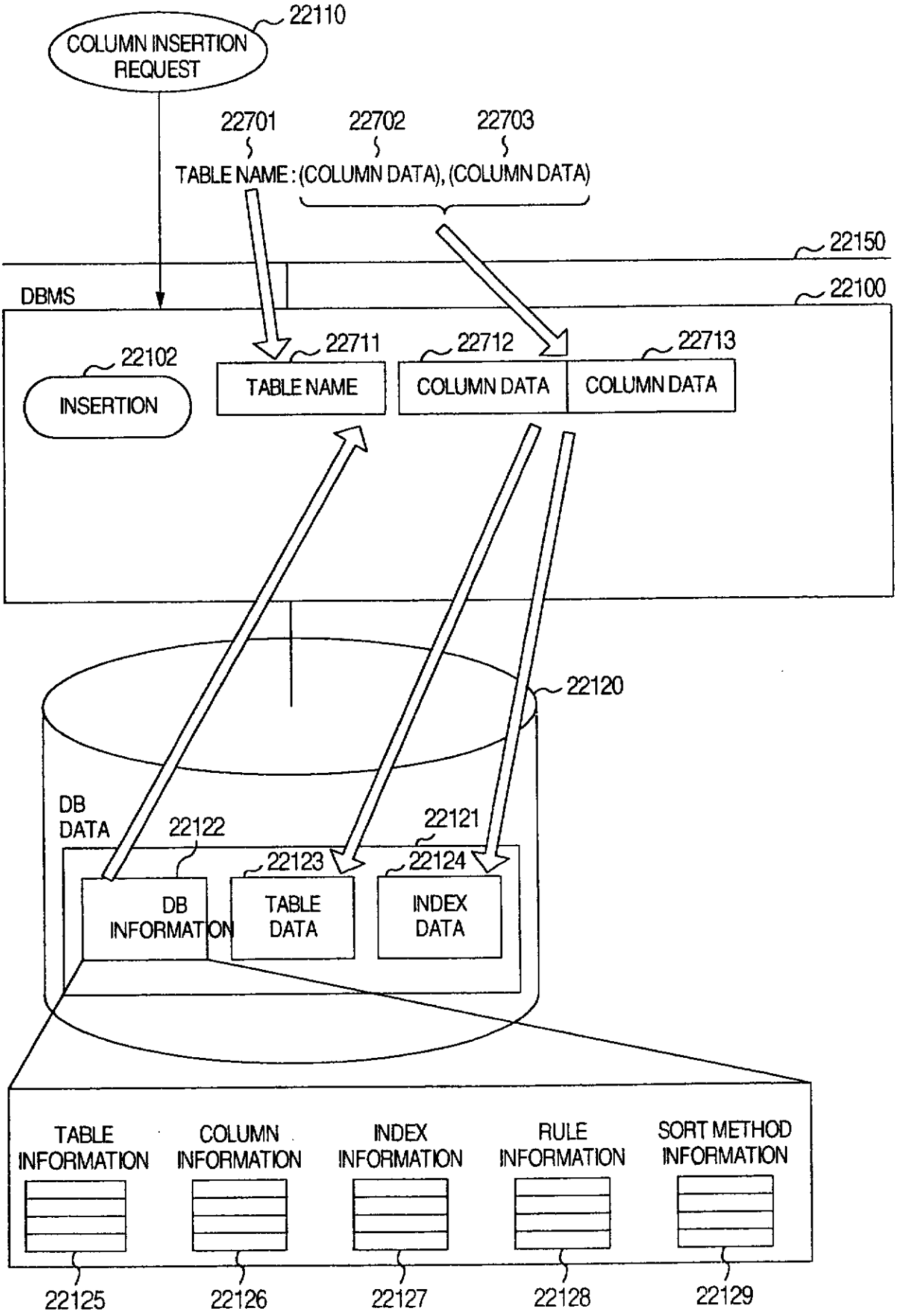

22110
COLUMN INSERTION REQUEST
22701
22702
22703
TABLE NAME : (COLUMN DATA), (COLUMN DATA)
22150
DBMS
22100
22102
INSERTION
22711
TABLE NAME
22712
COLUMN DATA
22713
COLUMN DATA
22120
DB DATA
22122
22121
22123
22124
DB INFORMATION
TABLE DATA
INDEX DATA
TABLE INFORMATION
COLUMN INFORMATION
INDEX INFORMATION
RULE INFORMATION
SORT METHOD INFORMATION
22125
22126
22127
22128
22129

FIG. 84

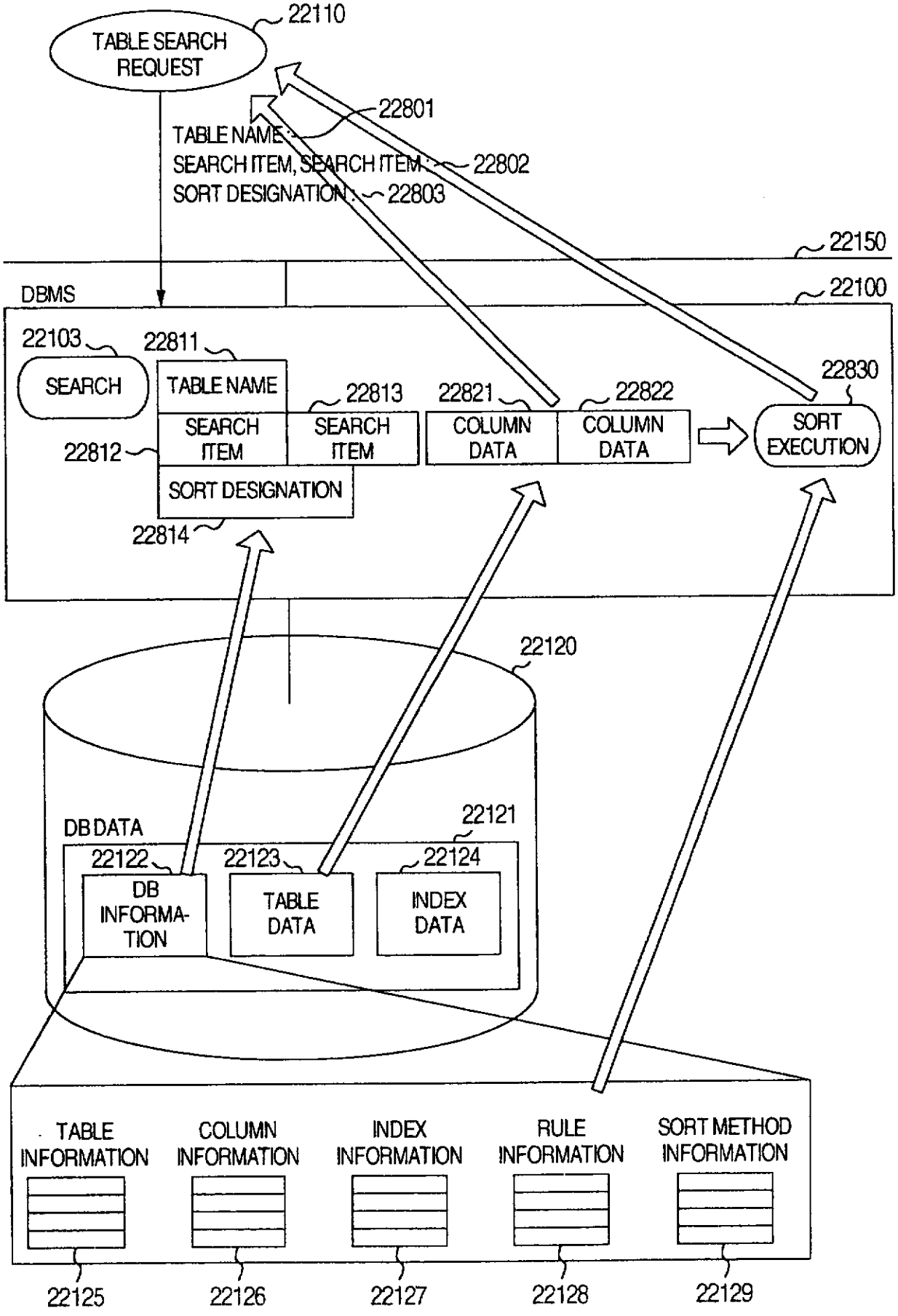

22110
TABLE SEARCH REQUEST
22801
TABLE NAME
SEARCH ITEM, SEARCH ITEM
22802
SORT DESIGNATION
22803
22150
DBMS
22100
22103
SEARCH
22811
TABLE NAME
22813
22821
22822
22830
SEARCH ITEM
SEARCH ITEM
COLUMN DATA
COLUMN DATA
SORT EXECUTION
22812
SORT DESIGNATION
22814
22120
DB DATA
22121
22122
22123
22124
DB INFORMA-TION
TABLE DATA
INDEX DATA
TABLE INFORMATION
COLUMN INFORMATION
INDEX INFORMATION
RULE INFORMATION
SORT METHOD INFORMATION
22125
22126
22127
22128
22129

FIG. 85

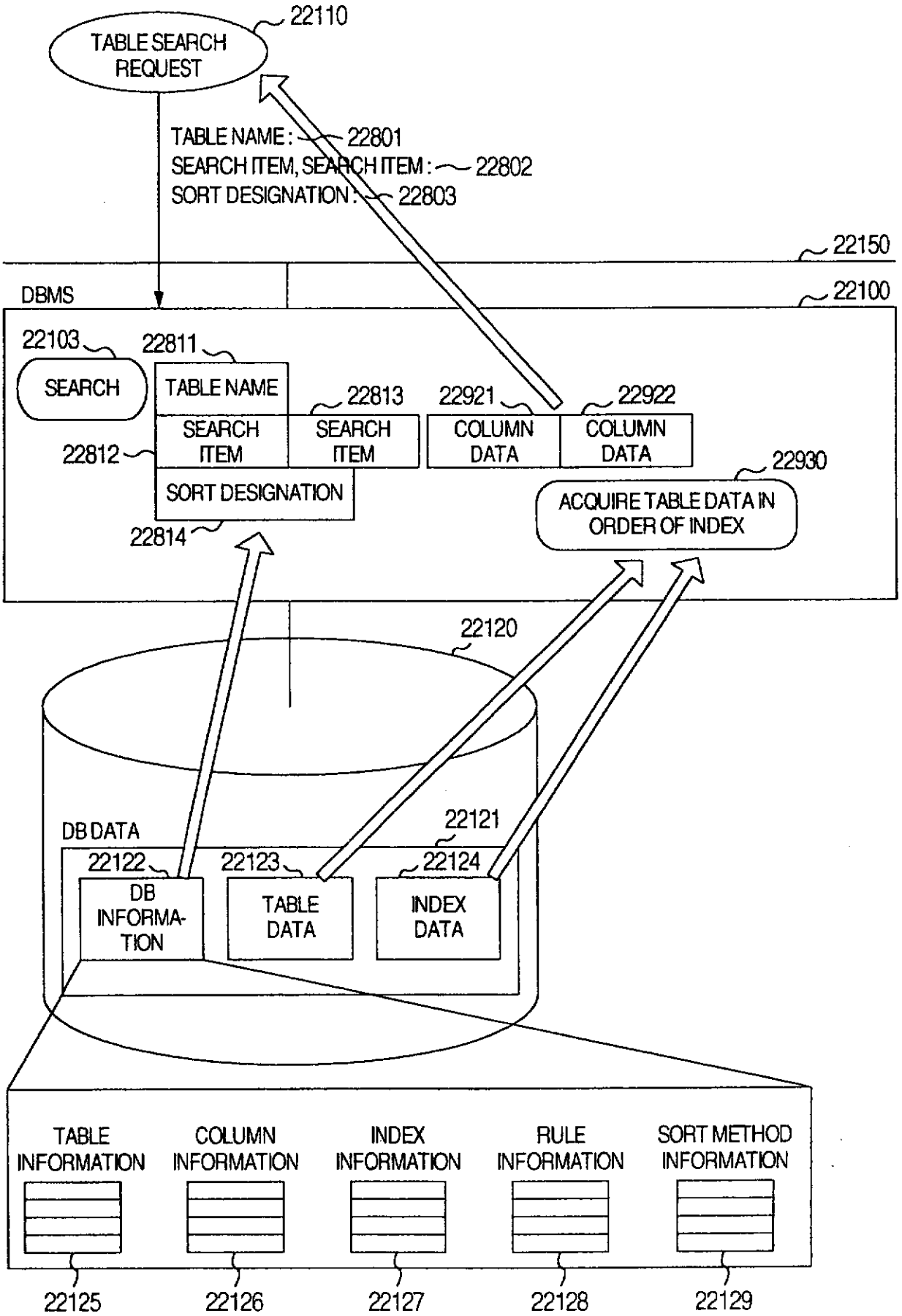

22110
TABLE SEARCH REQUEST
TABLE NAME : 22801
SEARCH ITEM, SEARCH ITEM : 22802
SORT DESIGNATION : 22803
22150
DBMS
22100
22103
SEARCH
22811
TABLE NAME
22813
SEARCH ITEM
SEARCH ITEM
22921
COLUMN DATA
22922
COLUMN DATA
22812
SORT DESIGNATION
22814
22930
ACQUIRE TABLE DATA IN ORDER OF INDEX
22120
DB DATA
22121
22122
DB INFORMA-TION
22123
TABLE DATA
22124
INDEX DATA
TABLE INFORMATION
COLUMN INFORMATION
INDEX INFORMATION
RULE INFORMATION
SORT METHOD INFORMATION
22125
22126
22127
22128
22129

FIG. 86

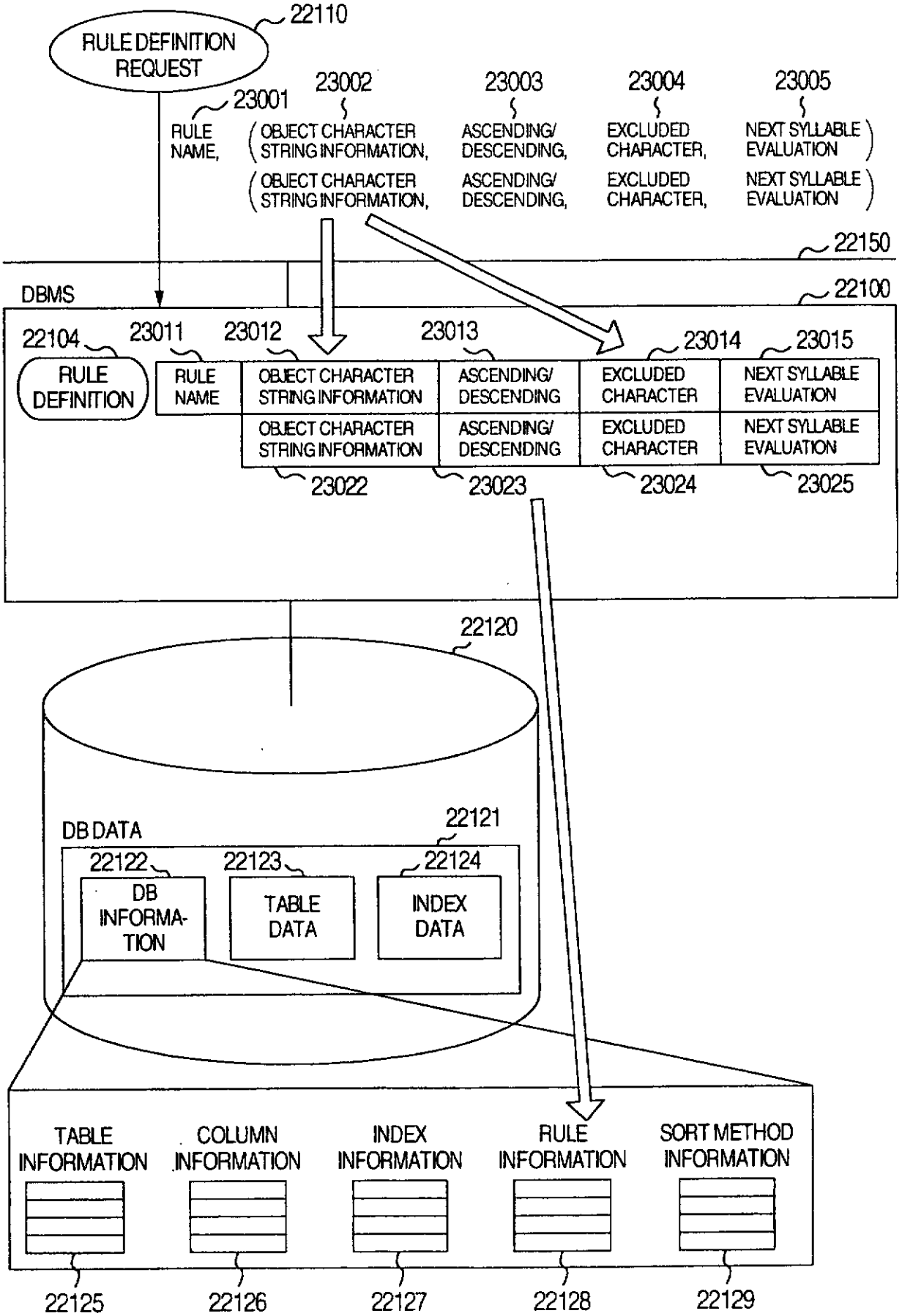

22110
RULE DEFINITION REQUEST
23001
23002
23003
23004
23005
RULE NAME,
OBJECT CHARACTER STRING INFORMATION,
ASCENDING/ DESCENDING,
EXCLUDED CHARACTER,
NEXT SYLLABLE EVALUATION
OBJECT CHARACTER STRING INFORMATION,
ASCENDING/ DESCENDING,
EXCLUDED CHARACTER,
NEXT SYLLABLE EVALUATION
22150
DBMS
22100
22104
23011
23012
23013
23014
23015
RULE DEFINITION
RULE NAME
OBJECT CHARACTER STRING INFORMATION
ASCENDING/ DESCENDING
EXCLUDED CHARACTER
NEXT SYLLABLE EVALUATION
OBJECT CHARACTER STRING INFORMATION
ASCENDING/ DESCENDING
EXCLUDED CHARACTER
NEXT SYLLABLE EVALUATION
23022
23023
23024
23025
22120
22121
DB DATA
22122
22123
22124
DB INFORMA-TION
TABLE DATA
INDEX DATA
TABLE INFORMATION
COLUMN INFORMATION
INDEX INFORMATION
RULE INFORMATION
SORT METHOD INFORMATION
22125
22126
22127
22128
22129

FIG. 87

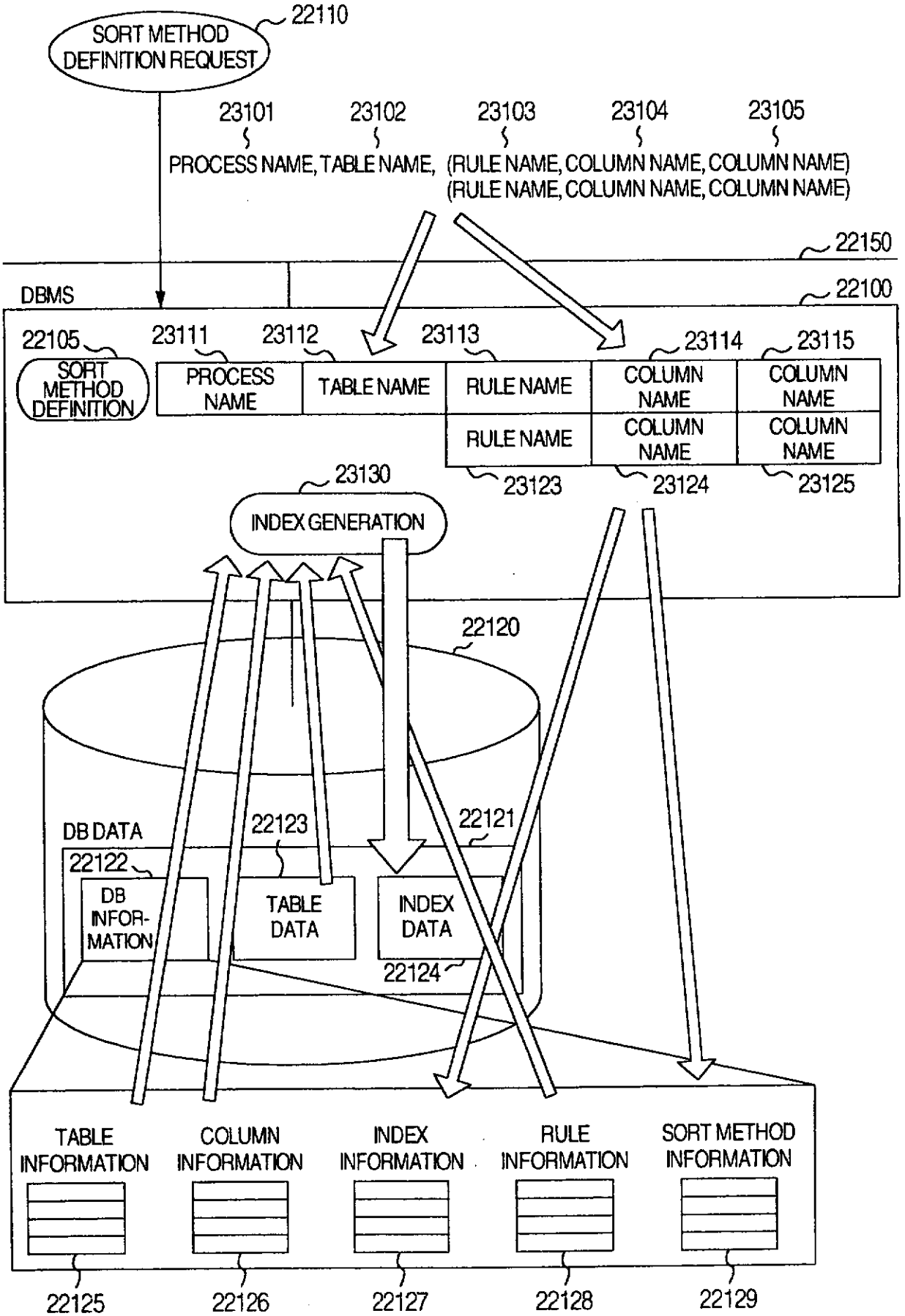

22110
SORT METHOD DEFINITION REQUEST
23101
23102
23103
23104
23105
PROCESS NAME, TABLE NAME, (RULE NAME, COLUMN NAME, COLUMN NAME)
(RULE NAME, COLUMN NAME, COLUMN NAME)
22150
DBMS
22100
22105
23111
23112
23113
23114
23115
SORT METHOD DEFINITION
PROCESS NAME
TABLE NAME
RULE NAME
COLUMN NAME
COLUMN NAME
RULE NAME
COLUMN NAME
COLUMN NAME
23123
23124
23125
23130
INDEX GENERATION
22120
DB DATA
22123
22121
22122
DB INFOR-MATION
TABLE DATA
INDEX DATA
22124
TABLE INFORMATION
COLUMN INFORMATION
INDEX INFORMATION
RULE INFORMATION
SORT METHOD INFORMATION
22125
22126
22127
22128
22129

FIG. 88

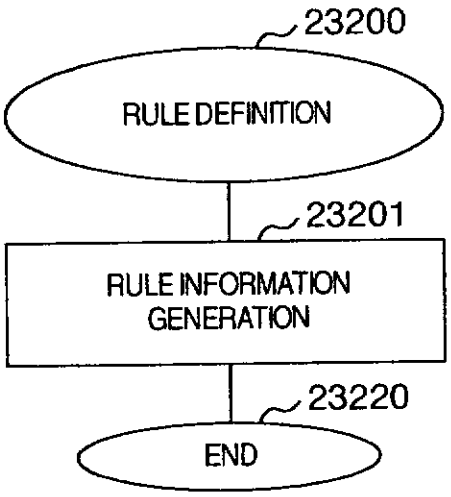
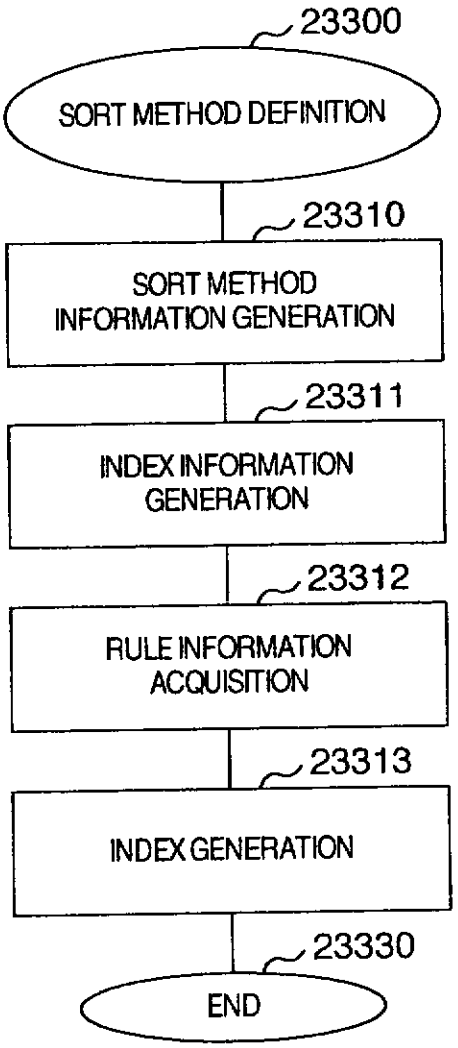

23200
RULE DEFINITION
23201
RULE INFORMATION GENERATION
23220
END

FIG. 89


23300
SORT METHOD DEFINITION
23310
SORT METHOD INFORMATION GENERATION
23311
INDEX INFORMATION GENERATION
23312
RULE INFORMATION ACQUISITION
23313
INDEX GENERATION
23330
END