**Fig. 1a.**

1st MAD implementation:

AD1, AD2, AD3,...AD50, BO1, BO2, BO3,....BO50

2nd MAD implementation:

AD1, BO1, AD2, BO2, AD3, BO3,.....AD50, BO50

3rd MAD implementation –

(AD file): AD1, AD2, AD3, .... AD50

(BO file): BO1, BO2, BO3,.....BO50

**Fig. 1b.**

MAD-DS implemented as a single file:

| | MADD_ AttrDesc | MADD_ PosSeqNbr |
|---|---|---|
| 1st record: | Ape, | 1 |
| 2nd record: | Bear, | 2 |
| 3rd record: | Cat, | 3 |
| 4th record: | Dog, | 4 |
| 5th record: | Eagle, | 5 |
| 6th record: | Fox, | 6 |

MADD_AttrDesc as 1 file: Ape, Bear, Cat, Dog, Eagle, Fox

MADD_PosSeqNbr as 1 file: 1, 2, 3, 4, 5, 6

**Fig. 1c.**

| *Relative Field Position* | 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|---|
| MADD_AttrDesc file: | Ape | Bear | Cat | Dog | Eagle | Fox |
| MADD_PosSeqNbr file: | 1 | 2 | 3 | 4 | 5 | 6 |

**Fig. 1d.**

| *Relative Field Position* | 1st | 2nd | 3rd | 4th |
|---|---|---|---|---|
| MADD_AttrDesc file: | Foxes | Dogs | Cat | Bears |
| MADD_PosSeqNbr file: | 6 | 4 | 3 | 2 |

Fig. 2a

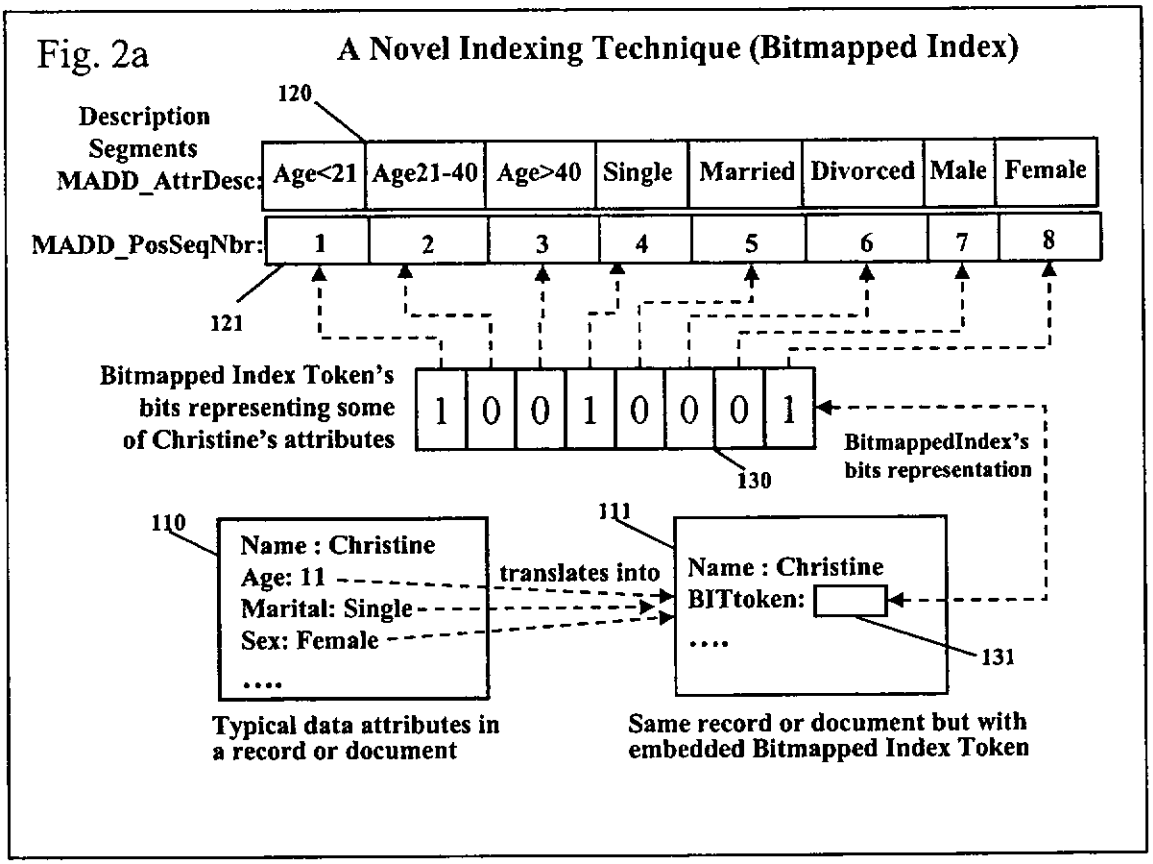
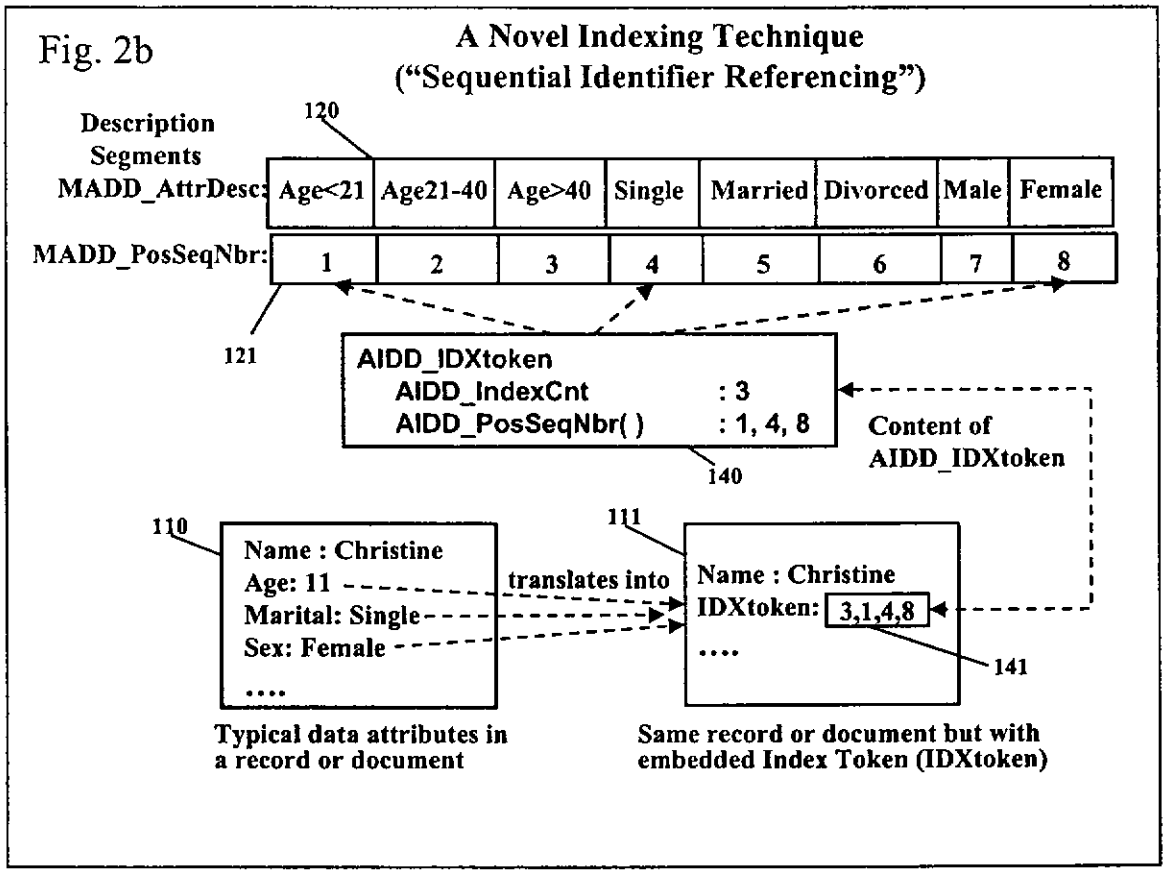

A Novel Indexing Technique (Bitmapped Index)
120
Description Segments MADD_AttrDesc:
Age<21
Age21-40
Age>40
Single
Married
Divorced
Male
Female
MADD_PosSeqNbr:
1
2
3
4
5
6
7
8
121
Bitmapped Index Token's bits representing some of Christine's attributes
1 0 0 1 0 0 0 1
130
BitmappedIndex's bits representation
110
Name : Christine
Age: 11
Marital: Single
Sex: Female
....
translates into
111
Name : Christine
BITtoken:
....
131
Typical data attributes in a record or document
Same record or document but with embedded Bitmapped Index Token

Fig. 2b


A Novel Indexing Technique
("Sequential Identifier Referencing")
Description Segments
MADD_AttrDesc:
120
Age<21
Age21-40
Age>40
Single
Married
Divorced
Male
Female
MADD_PosSeqNbr:
1
2
3
4
5
6
7
8
121
AIDD_IDXtoken
AIDD_IndexCnt : 3
AIDD_PosSeqNbr( ) : 1, 4, 8
140
Content of AIDD_IDXtoken
110
Name : Christine
Age: 11
Marital: Single
Sex: Female
....
translates into
111
Name : Christine
IDXtoken: 3,1,4,8
....
141
Typical data attributes in a record or document
Same record or document but with embedded Index Token (IDXtoken)

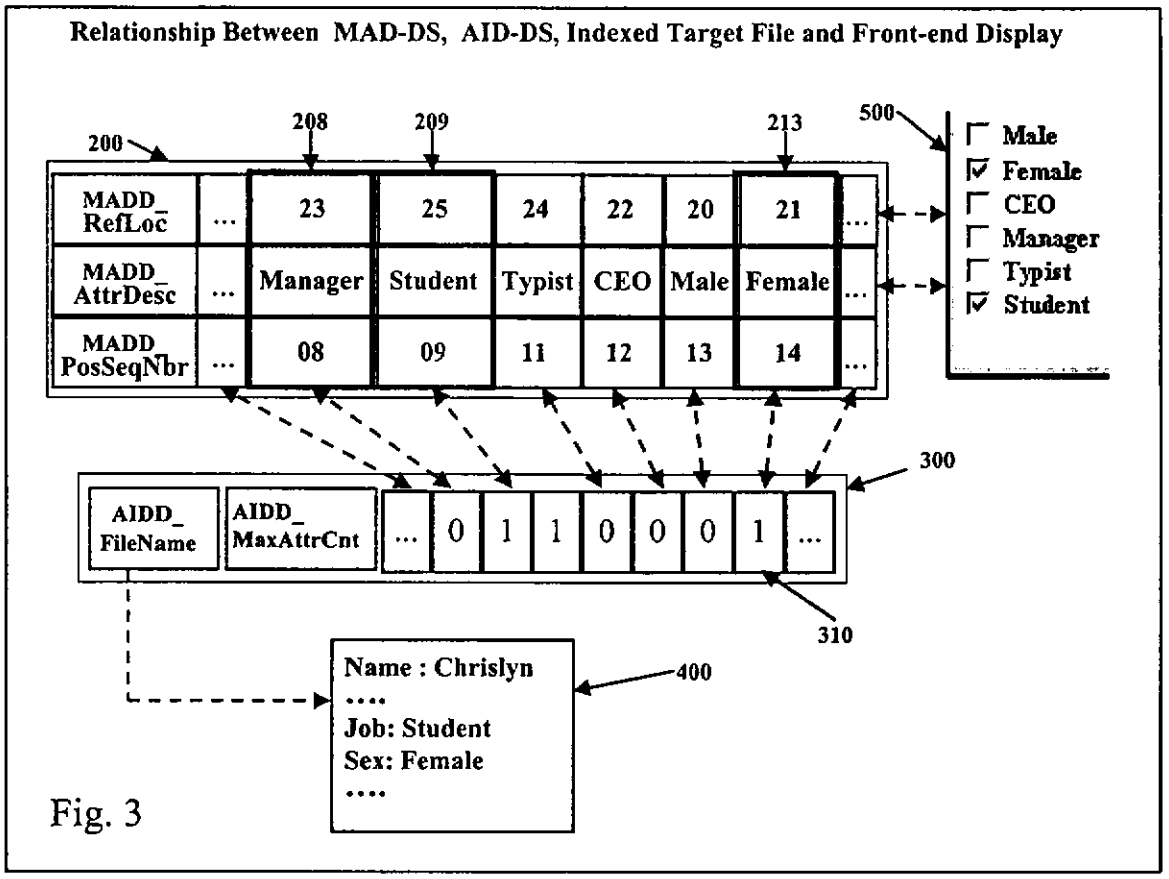
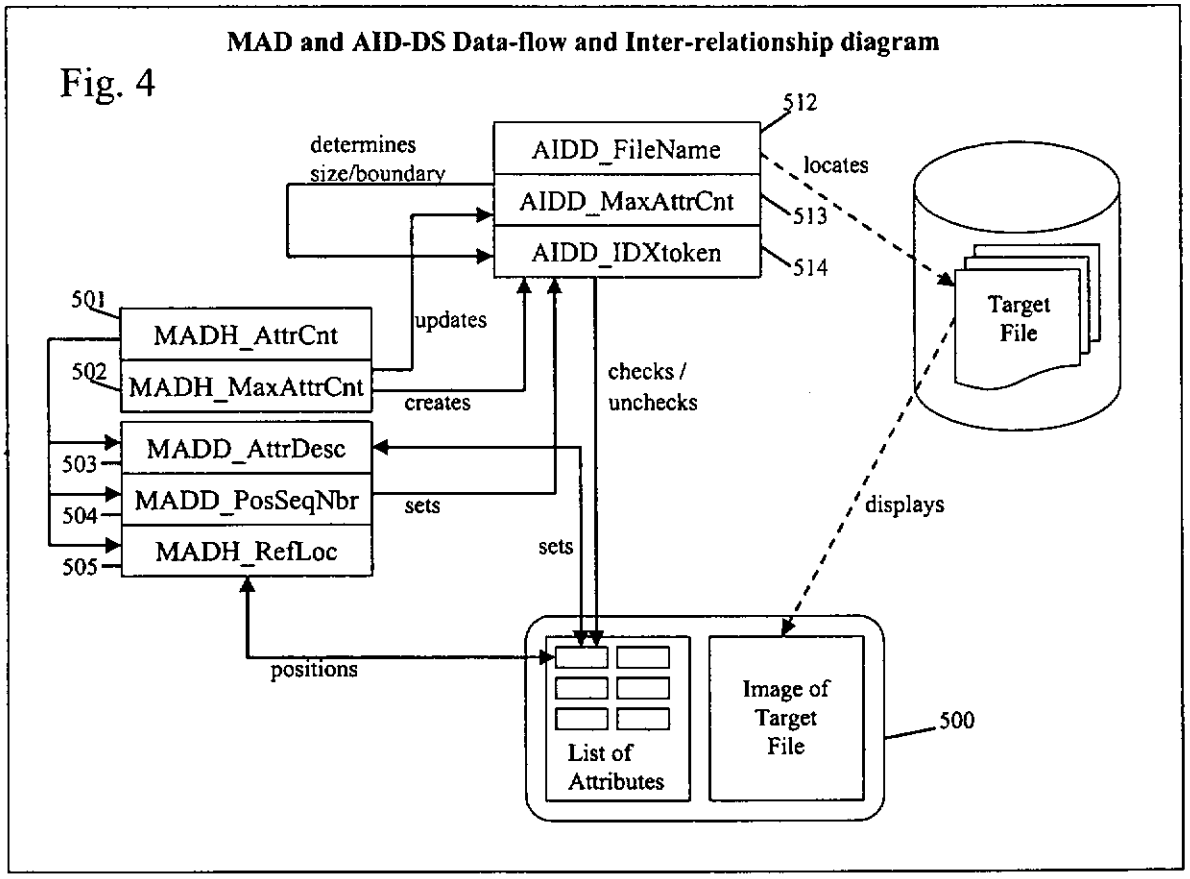

Relationship Between MAD-DS, AID-DS, Indexed Target File and Front-end Display
200
208
209
213
500
MADD_ RefLoc
MADD_ AttrDesc
MADD_ PosSeqNbr
23
25
24
22
20
21
Manager
Student
Typist
CEO
Male
Female
08
09
11
12
13
14
Male
Female
CEO
Manager
Typist
Student
300
AIDD_ FileName
AIDD_ MaxAttrCnt
0 1 1 0 0 0 1
310
Name : Chrislyn
....
Job: Student
Sex: Female
....
400

Fig. 3

Fig. 4


MAD and AID-DS Data-flow and Inter-relationship diagram
512
AIDD_FileName
AIDD_MaxAttrCnt
AIDD_IDXtoken
513
514
determines
size/boundary
locates
Target
File
501
MADH_AttrCnt
502
MADH_MaxAttrCnt
updates
creates
checks /
unchecks
503
MADD_AttrDesc
504
MADD_PosSeqNbr
505
MADH_RefLoc
sets
sets
displays
positions
List of
Attributes
Image of
Target
File
500