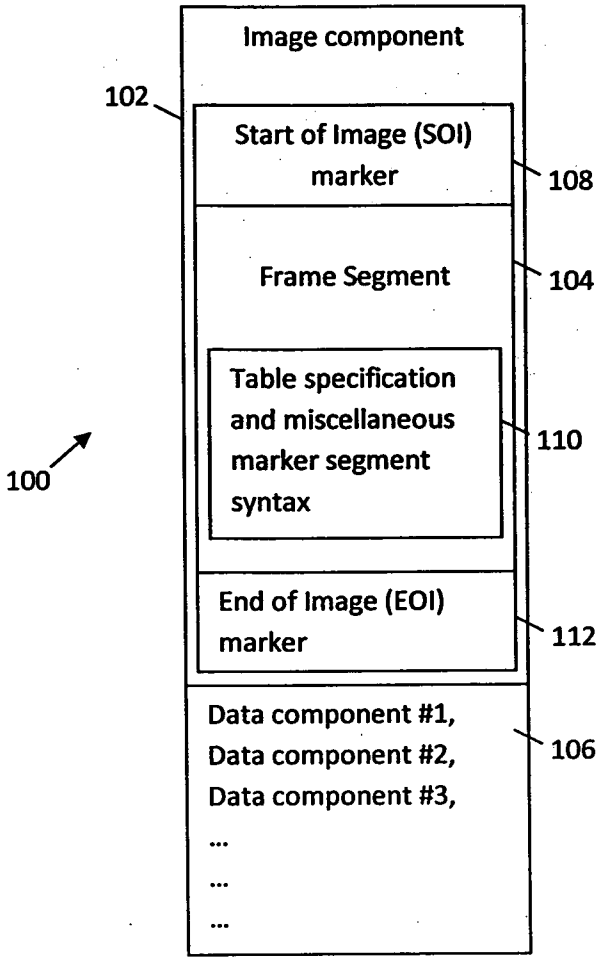

Image component
102
Start of Image (SOI) marker
108
Frame Segment
104
Table specification and miscellaneous marker segment syntax
110
100
End of Image (EOI) marker
112
Data component #1,
Data component #2,
Data component #3,
...
...
...
106

Figure 1

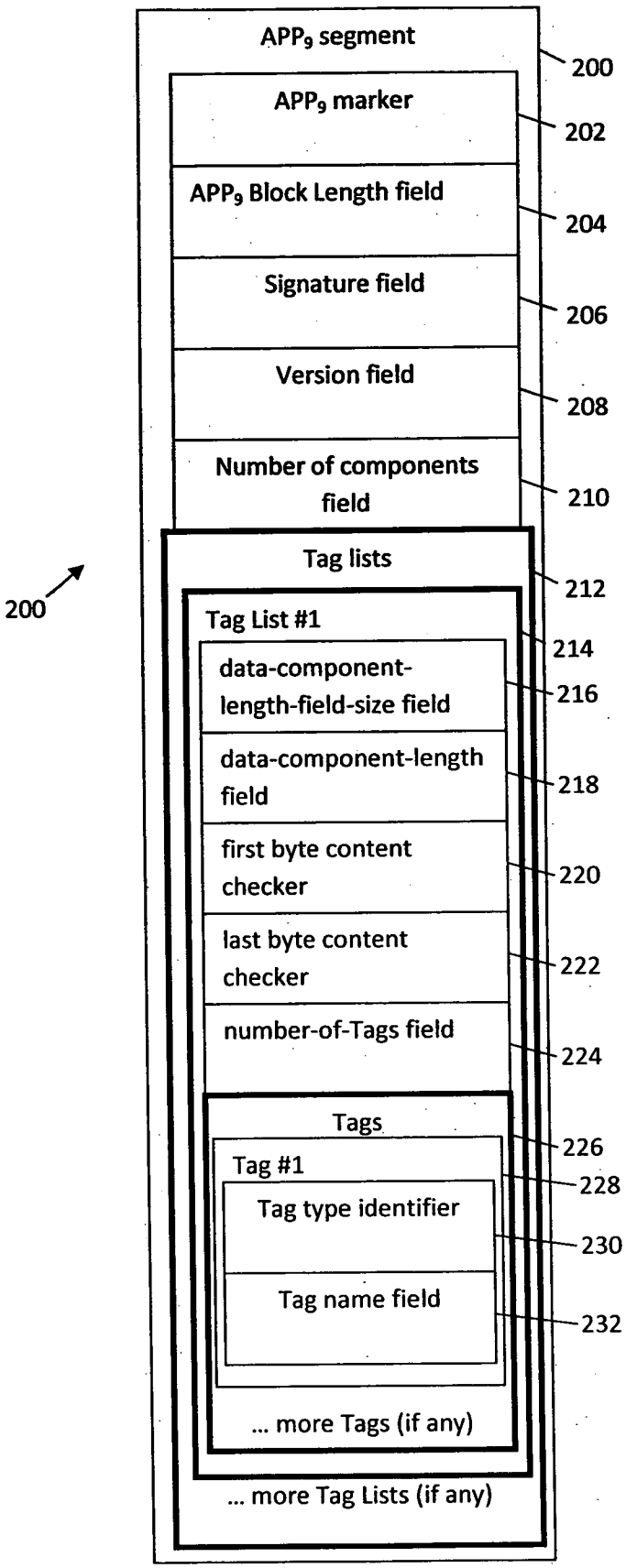

APP9 segment
200
APP9 marker
202
APP9 Block Length field
204
Signature field
206
Version field
208
Number of components field
210
Tag lists
212
200
Tag List #1
214
data-component-length-field-size field
216
data-component-length field
218
first byte content checker
220
last byte content checker
222
number-of-Tags field
224
Tags
226
Tag #1
228
Tag type identifier
230
Tag name field
232
... more Tags (if any)
... more Tag Lists (if any)

Figure 2

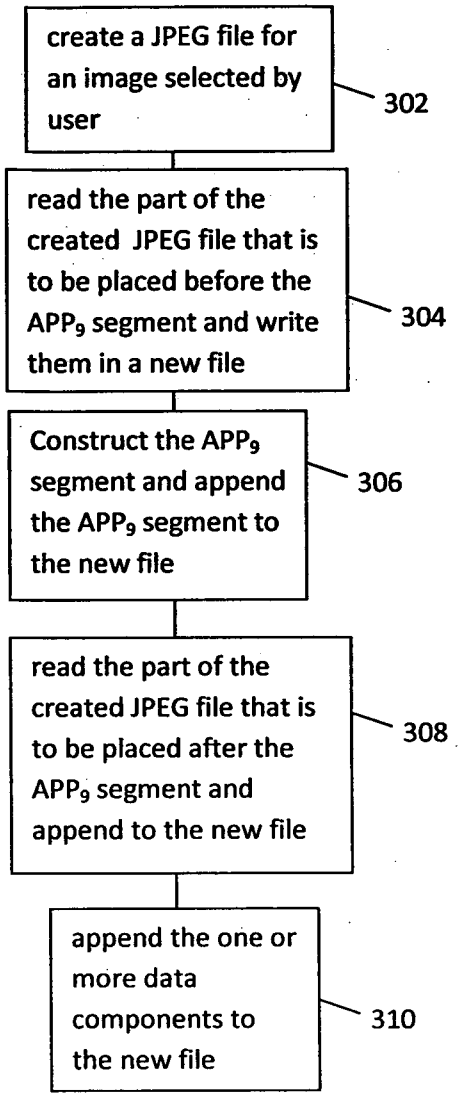

create a JPEG file for an image selected by user
302
read the part of the created JPEG file that is to be placed before the APP9 segment and write them in a new file
304
Construct the APP9 segment and append the APP9 segment to the new file
306
read the part of the created JPEG file that is to be placed after the APP9 segment and append to the new file
308
append the one or more data components to the new file
310

Figure 3

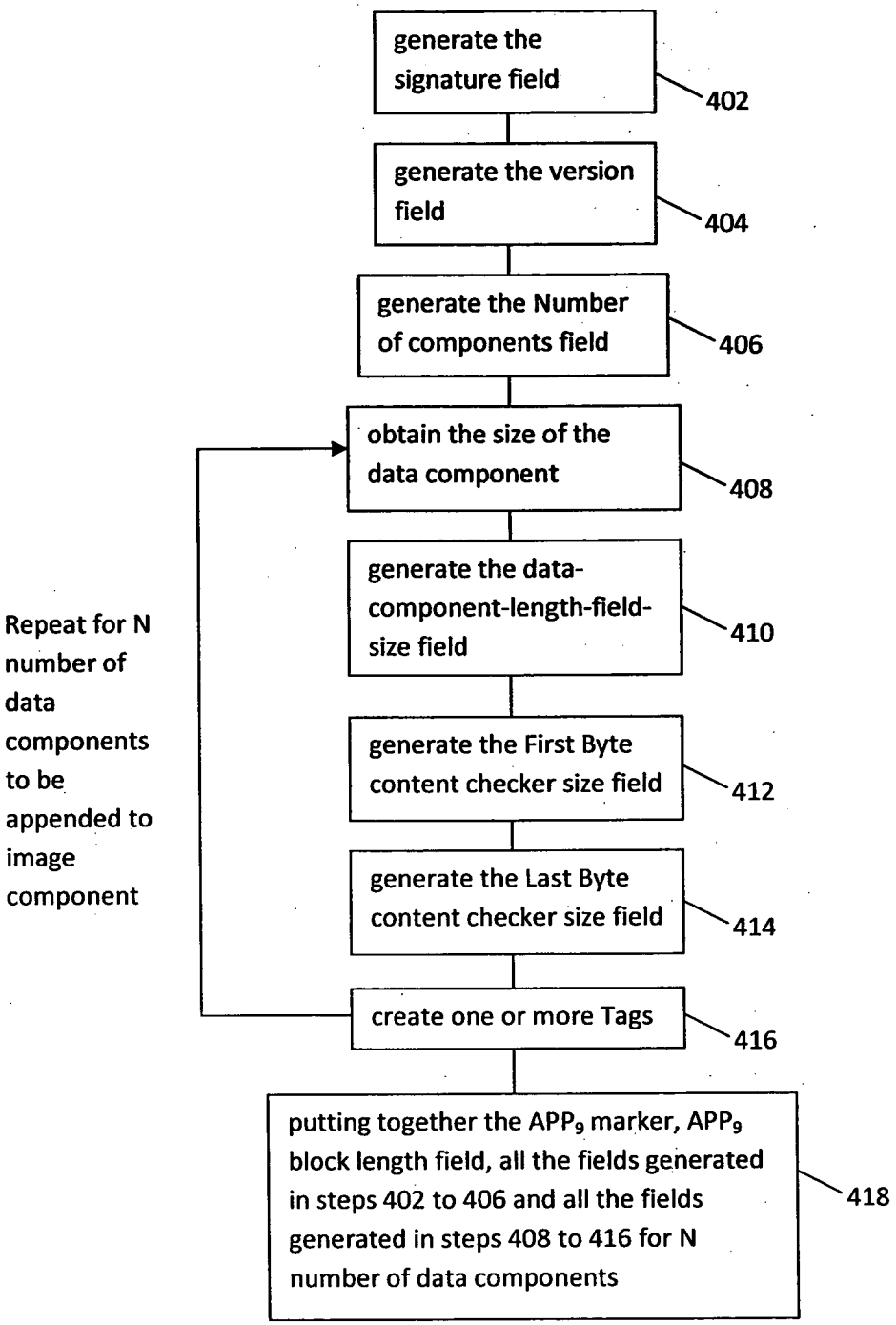

generate the signature field
402
generate the version field
404
generate the Number of components field
406
obtain the size of the data component
408
generate the data-component-length-field-size field
410
generate the First Byte content checker size field
412
generate the Last Byte content checker size field
414
create one or more Tags
416
putting together the APP9 marker, APP9 block length field, all the fields generated in steps 402 to 406 and all the fields generated in steps 408 to 416 for N number of data components
418
Repeat for N number of data components to be appended to image component

Figure 4

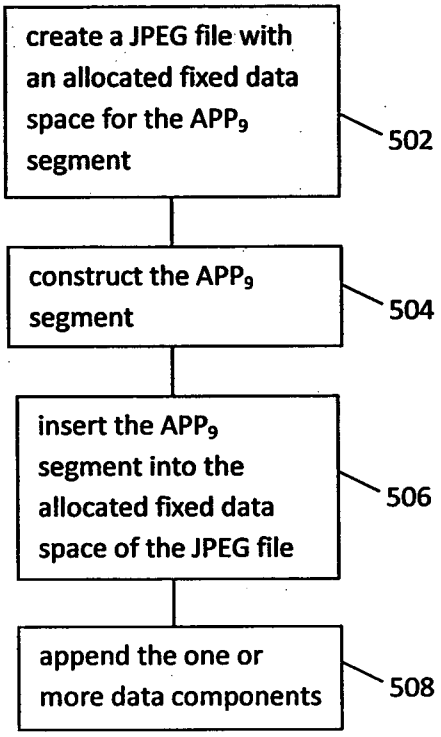

create a JPEG file with an allocated fixed data space for the APP9 segment
502
construct the APP9 segment
504
insert the APP9 segment into the allocated fixed data space of the JPEG file
506
append the one or more data components
508

Figure 5

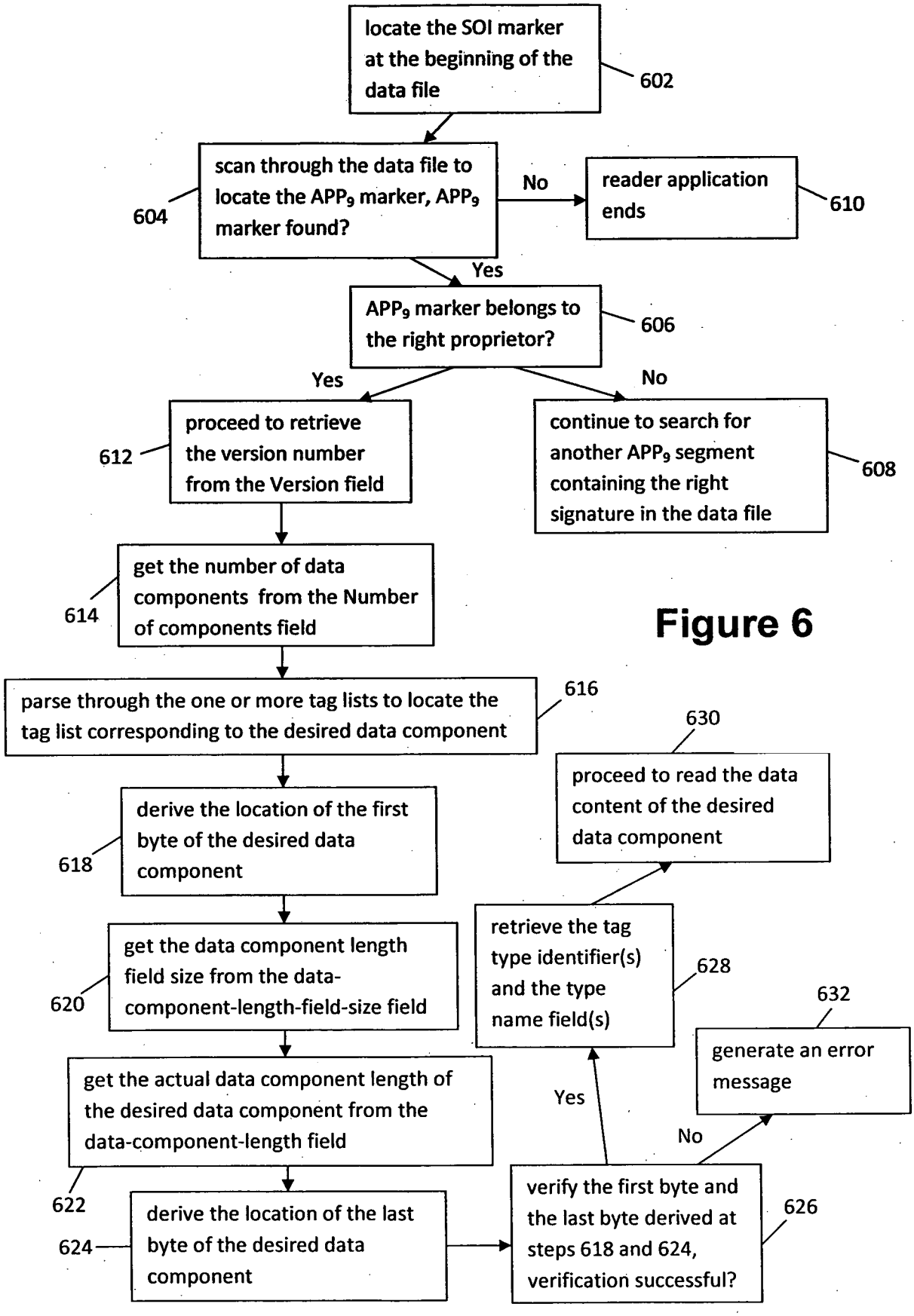

locate the SOI marker at the beginning of the data file
602
scan through the data file to locate the APP9 marker, APP9 marker found?
604
No
reader application ends
610
Yes
APP9 marker belongs to the right proprietor?
606
Yes
No
proceed to retrieve the version number from the Version field
612
continue to search for another APP9 segment containing the right signature in the data file
608
get the number of data components from the Number of components field
614
parse through the one or more tag lists to locate the tag list corresponding to the desired data component
616
derive the location of the first byte of the desired data component
618
get the data component length field size from the data-component-length-field-size field
620
get the actual data component length of the desired data component from the data-component-length field
622
derive the location of the last byte of the desired data component
624
verify the first byte and the last byte derived at steps 618 and 624, verification successful?
626
Yes
No
retrieve the tag type identifier(s) and the type name field(s)
628
proceed to read the data content of the desired data component
630
generate an error message
632

Figure 6

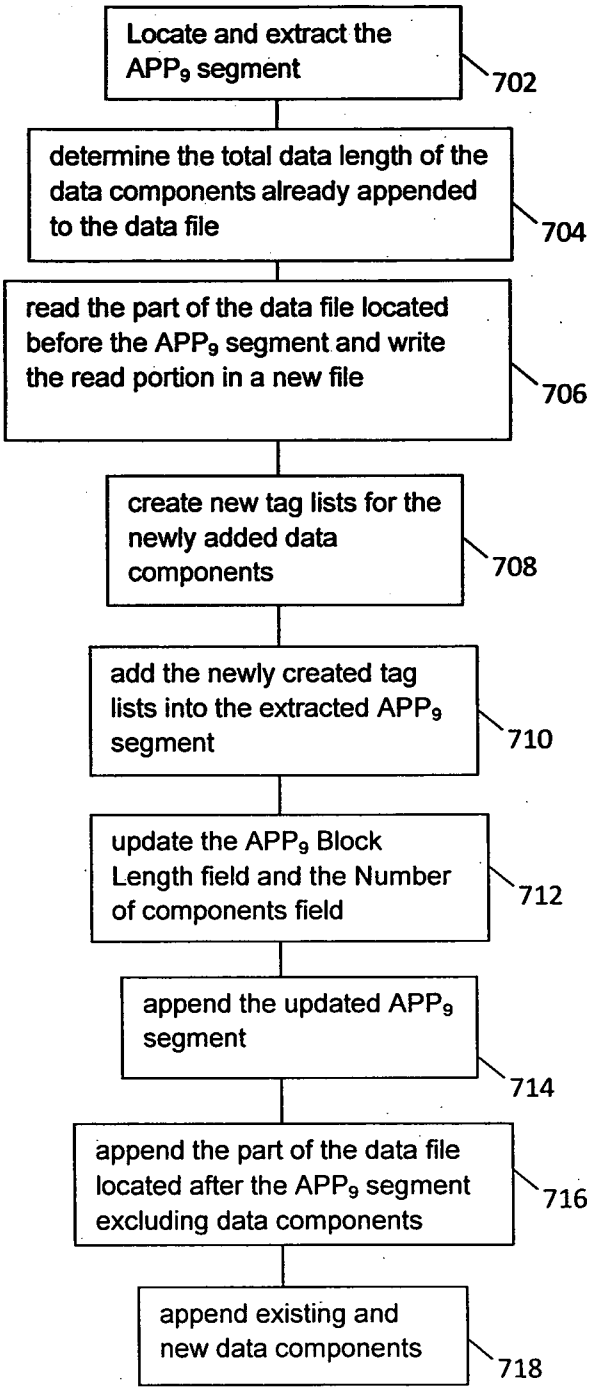

Locate and extract the APP9 segment
702
determine the total data length of the data components already appended to the data file
704
read the part of the data file located before the APP9 segment and write the read portion in a new file
706
create new tag lists for the newly added data components
708
add the newly created tag lists into the extracted APP9 segment
710
update the APP9 Block Length field and the Number of components field
712
append the updated APP9 segment
714
append the part of the data file located after the APP9 segment excluding data components
716
append existing and new data components
718

Figure 7

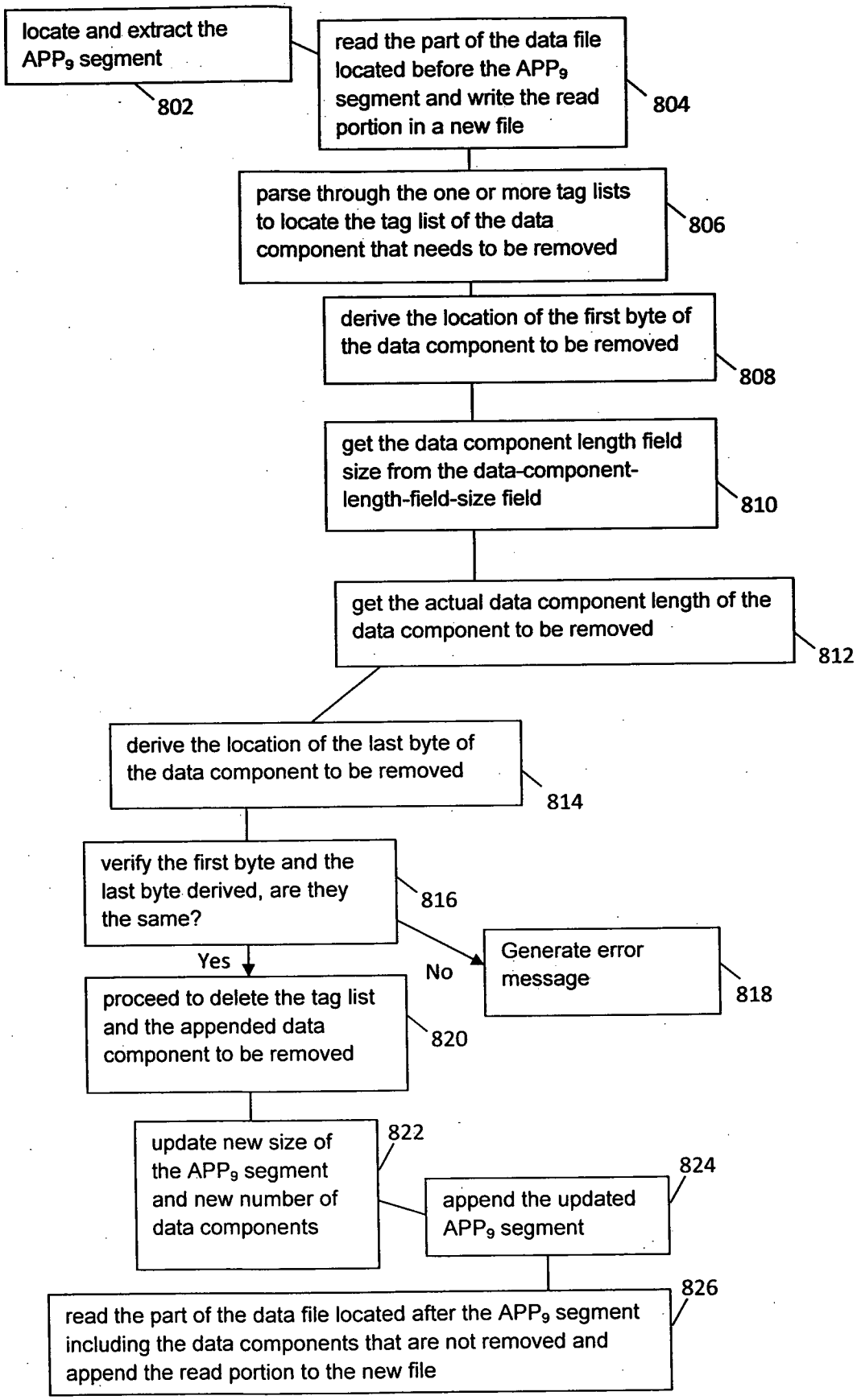

locate and extract the APP9 segment
802
read the part of the data file located before the APP9 segment and write the read portion in a new file
804
parse through the one or more tag lists to locate the tag list of the data component that needs to be removed
806
derive the location of the first byte of the data component to be removed
808
get the data component length field size from the data-component-length-field-size field
810
get the actual data component length of the data component to be removed
812
derive the location of the last byte of the data component to be removed
814
verify the first byte and the last byte derived, are they the same?
816
Yes
No
Generate error message
818
proceed to delete the tag list and the appended data component to be removed
820
update new size of the APP9 segment and new number of data components
822
append the updated APP9 segment
824
read the part of the data file located after the APP9 segment including the data components that are not removed and append the read portion to the new file
826

Figure 8

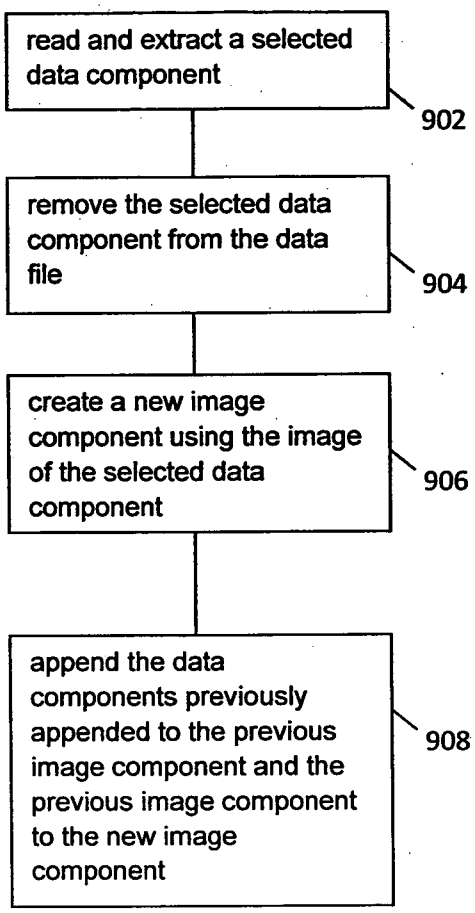

read and extract a selected data component
902
remove the selected data component from the data file
904
create a new image component using the image of the selected data component
906
append the data components previously appended to the previous image component and the previous image component to the new image component
908

Figure 9