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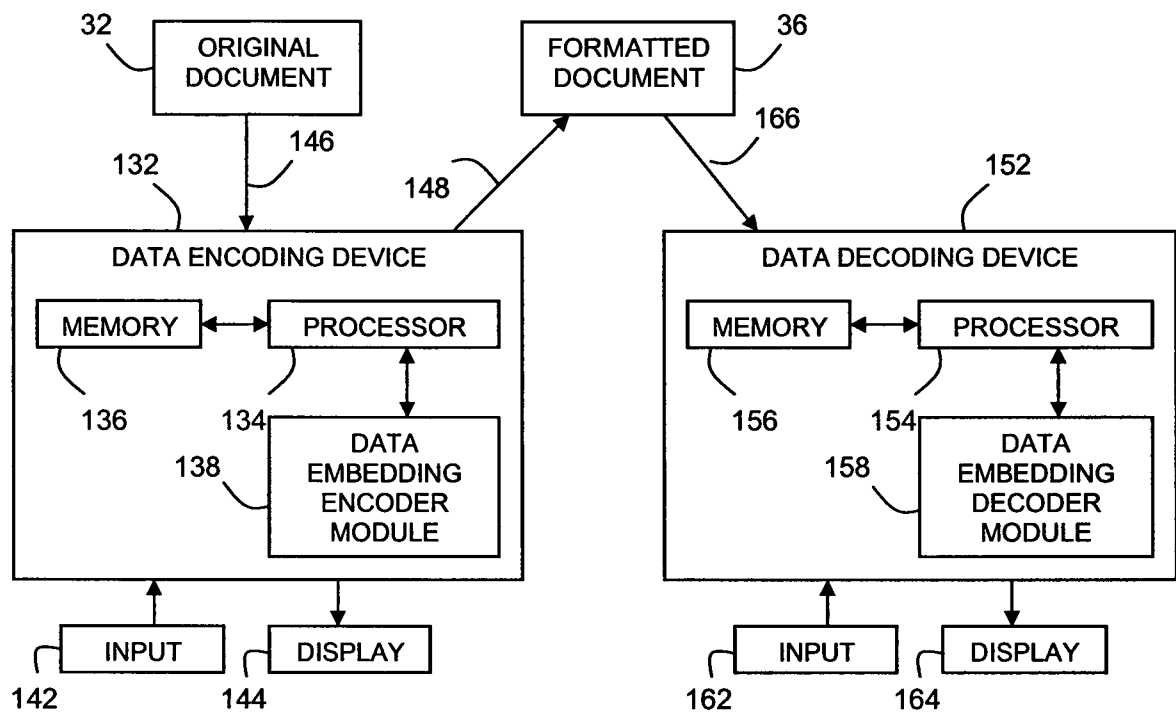


FIG. 1

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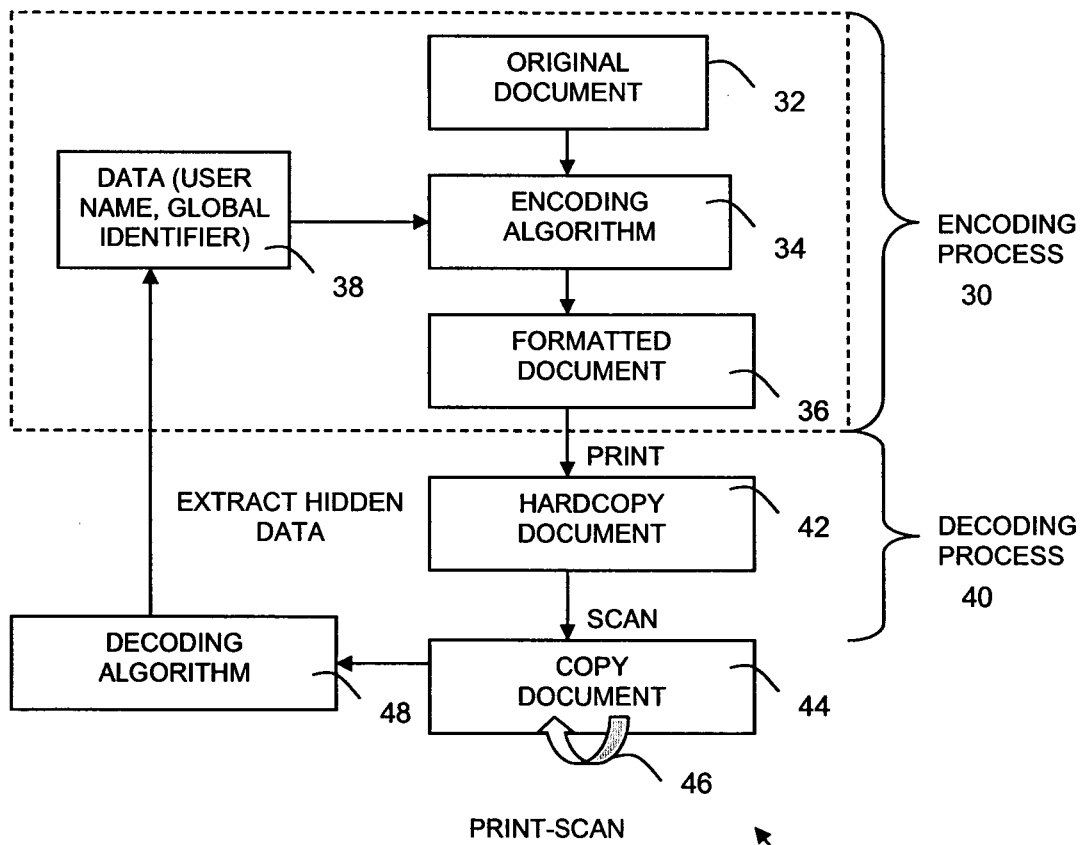


FIG. 2

20

| Un-rotated | 2 degree | 4 degree | 6 degree | 8 degree | 10 degree | 12 degree |
|------------|----------|----------|----------|----------|-----------|-----------|
| a          | a        | a        | a        | a        | a         | a         |
| c          | c        | c        | c        | c        | c         | c         |
| e          | e        | e        | e        | e        | e         | e         |
| s          | s        | s        | s        | s        | s         | s         |

FIG. 3

50

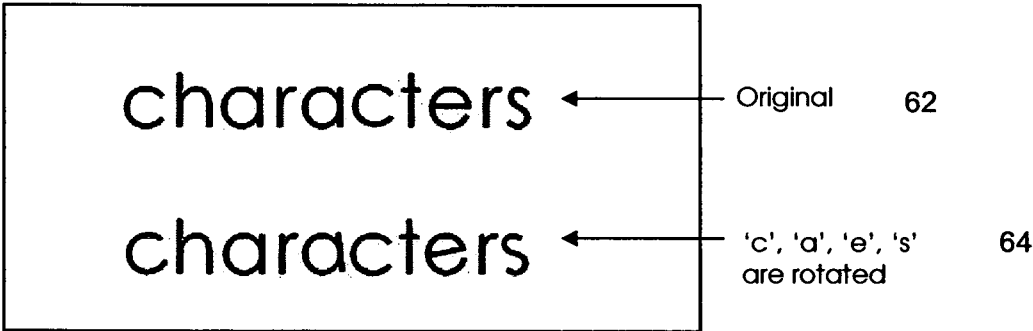


FIG. 4

60

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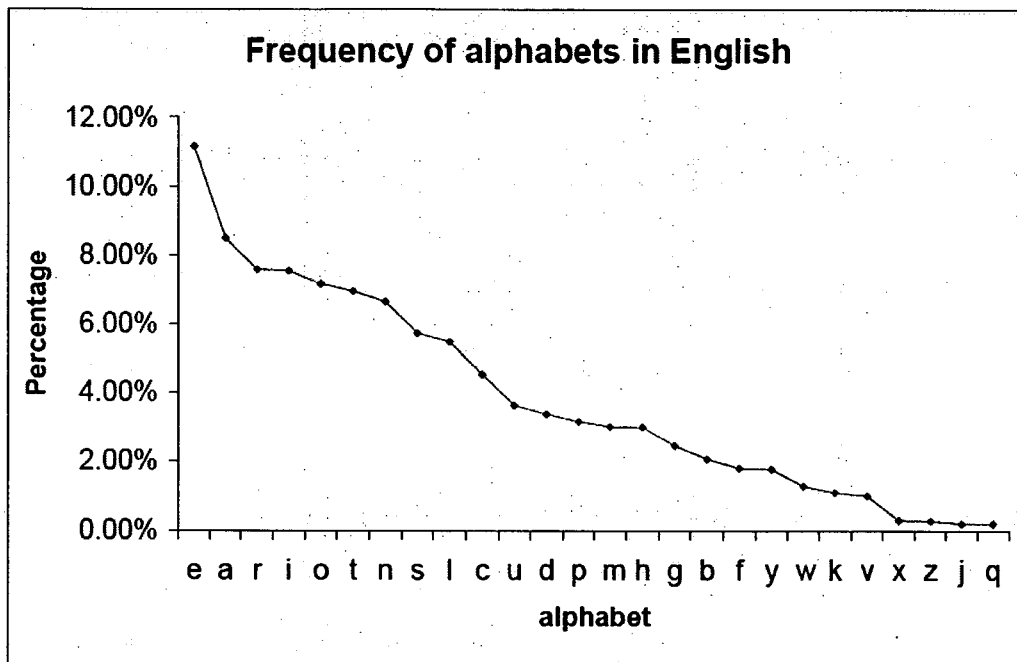


FIG. 5

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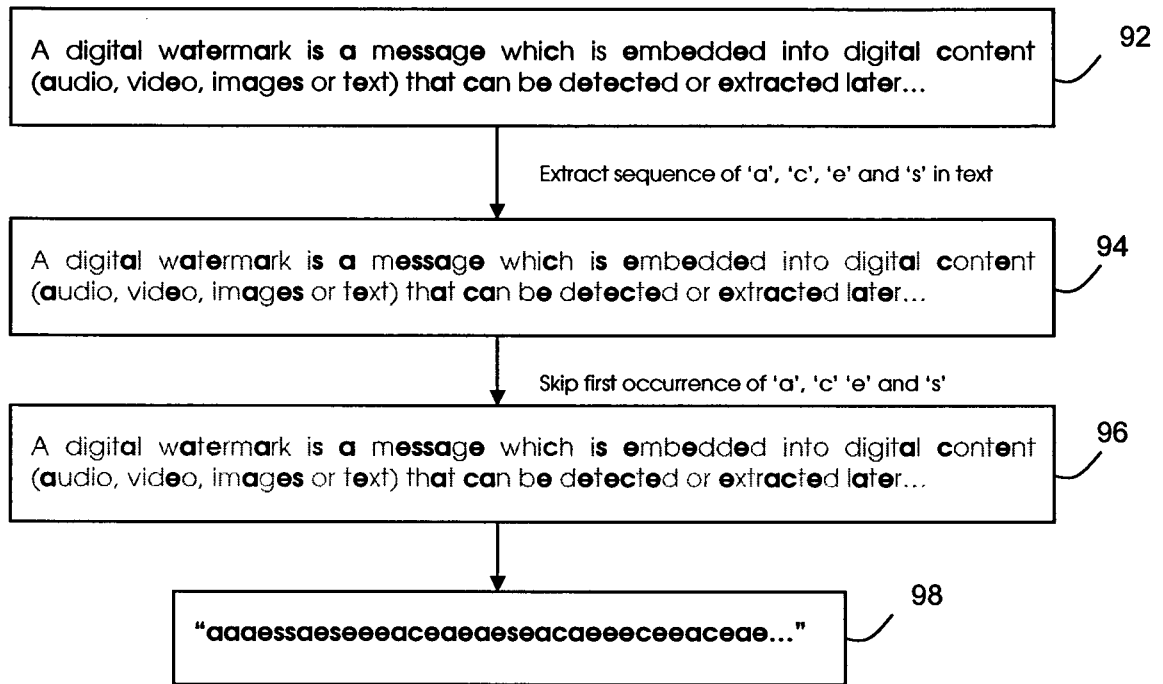
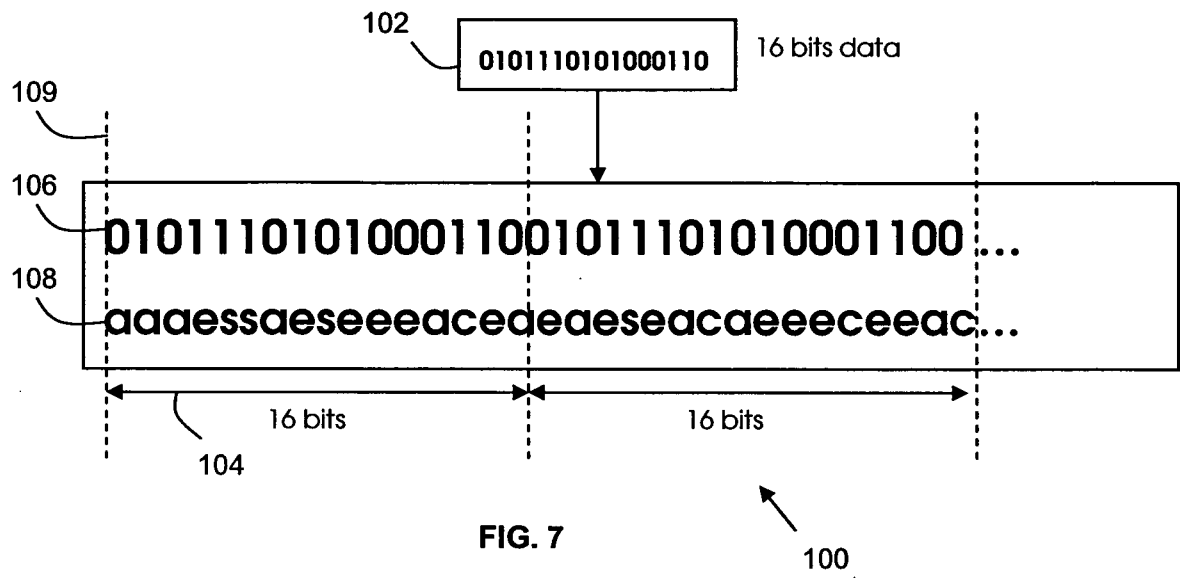


**FIG. 6**

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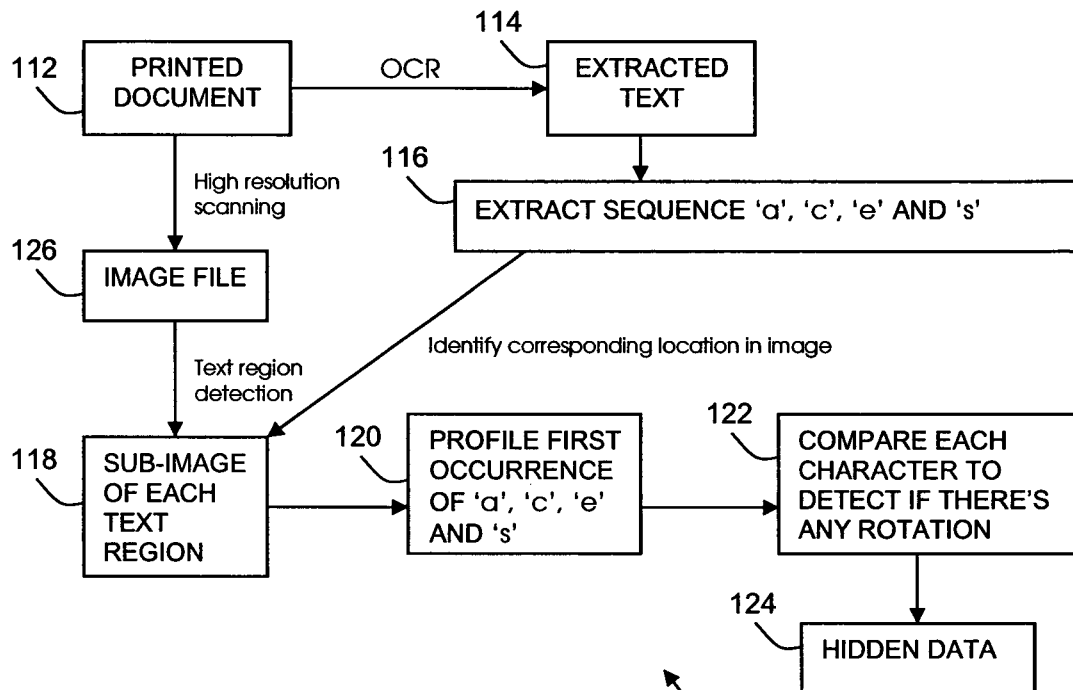


FIG. 8

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| Techniques                                  | Covert storage capacity                           | Robustness |            |            | Document Restrictions                      | Self verifiable? |
|---------------------------------------------|---------------------------------------------------|------------|------------|------------|--------------------------------------------|------------------|
|                                             |                                                   | PS         | AT         | Sc         |                                            |                  |
| Dots encoding                               | High:<br>> 1000 bits (A4)                         | 1-2        | Partial    | Yes        | Binary text document without halftone      | Yes              |
| Space modulation (sentence or words)        | Medium:<br>1 bit per sentence, word               | ~10        | Yes        | Yes        | NIL                                        | No               |
| Luminance modulation                        | Medium:<br>1 bit per word                         | 1-2        | Yes        | Yes        | NIL                                        | Yes              |
| Halftone quantization                       | High:<br>1 bit per word or character              | 1-2        | Yes        | Yes        | NIL                                        | Yes              |
| Component manipulations                     | High:<br>1 bit per component variation            | 1-2        | Yes        | Yes        | NIL                                        | No               |
| Syntactic methods                           | Low:<br>1 bit per syntax variation                | No limit   | Yes        | Yes        | Language with sufficient syntax variations | No               |
| <b>Current Embodiments of the Invention</b> | <b>High:<br/>&gt; 1 bit encoding per sentence</b> | <b>~10</b> | <b>Yes</b> | <b>Yes</b> | <b>NIL</b>                                 | <b>Yes</b>       |

FIG. 9


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