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United States Patent [19]

Malladi et al.

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[54] **METHOD FOR PARTITIONING HARDWARE AND FIRMWARE TASKS IN DIGITAL AUDIO/VIDEO DECODING**

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[73] Assignee: **LSI Logic Corporation**, Milpitas, Calif.

[21] Appl. No.: **643,185**

[22] Filed: **May 3, 1996**

[51] **Int. Cl.**[6] **H04N 7/36**; H04N 7/50

[52] **U.S. Cl.** **348/390**; 348/423; 348/845; 381/2; 704/504

[58] **Field of Search** 348/423, 845, 348/390; 381/2; 704/504; H04N 7/36, 7/50

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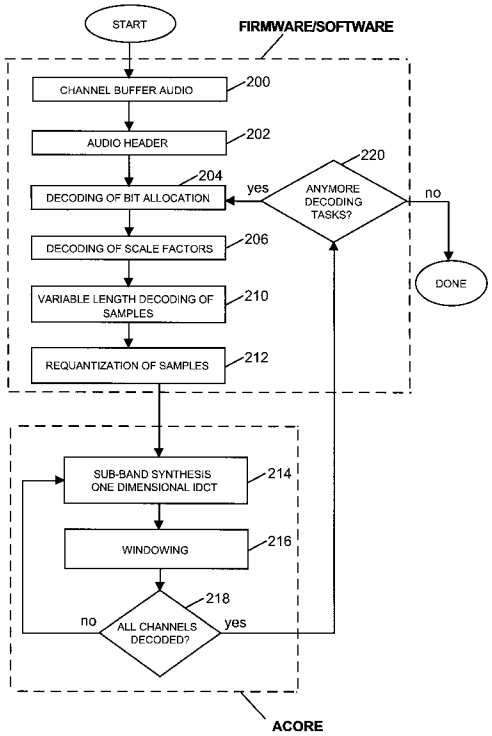
Attorney, Agent, or Firm—Hickman & Martine, LLP

[57] **ABSTRACT**

Disclosed is a partitioning procedure for designing MPEG decoders, AC-3 decoders, and decoders for other audio/video standards. The procedure provides that some specified decoding functionality be implemented exclusively in the form of hardware and certain other specified decoding functionality be provided exclusively as firmware or software. A video decoder designed according to this procedure includes the following elements: (a) firmware or software for implementing, in conjunction with a CPU, video header processing functions; and (b) hardware for implementing preparsing assist, macroblock reconstruction, and video display control functions. An audio decoder designed according to this procedure includes the following elements: (a) firmware or software for implementing, in conjunction with a CPU, decoding fields containing parameters for processing the audio data; and (b) hardware for implementing matrixing and windowing functions on the audio data.

24 Claims, 6 Drawing Sheets



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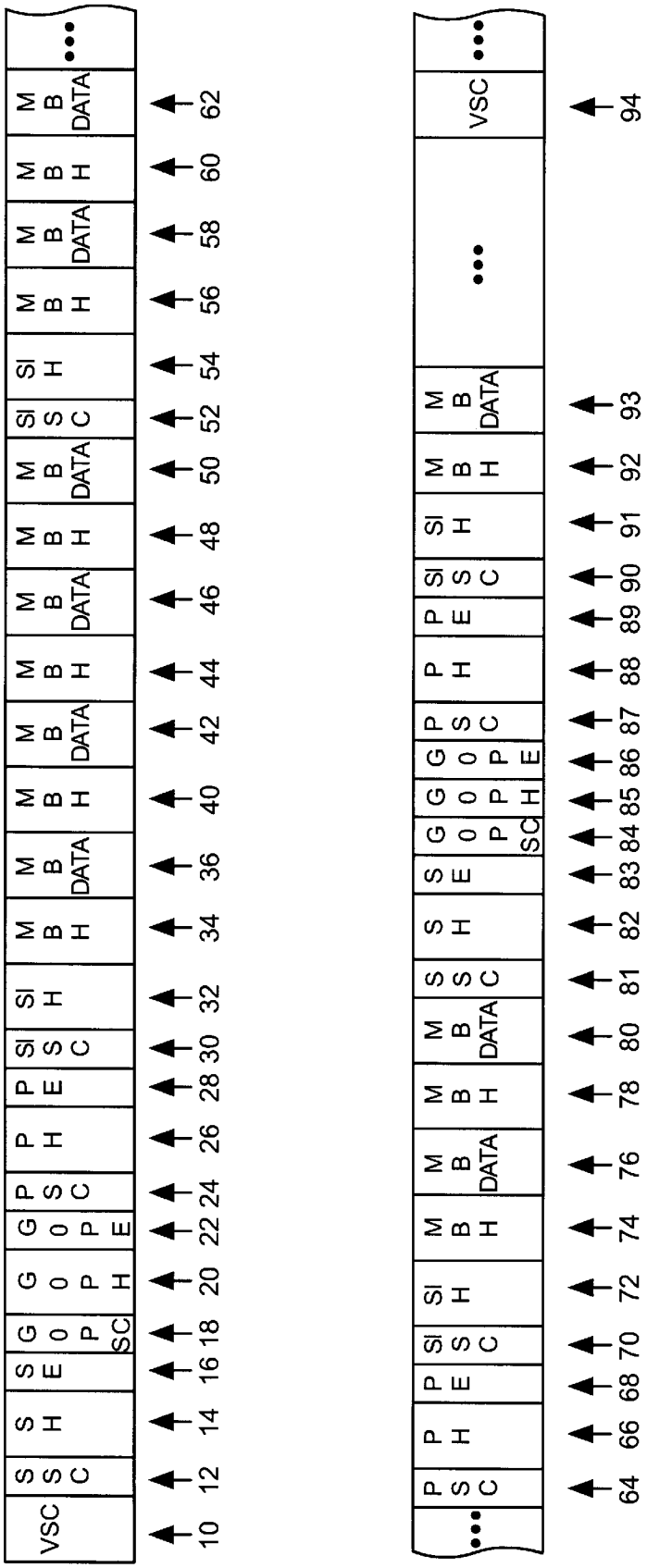

FIG. 1A

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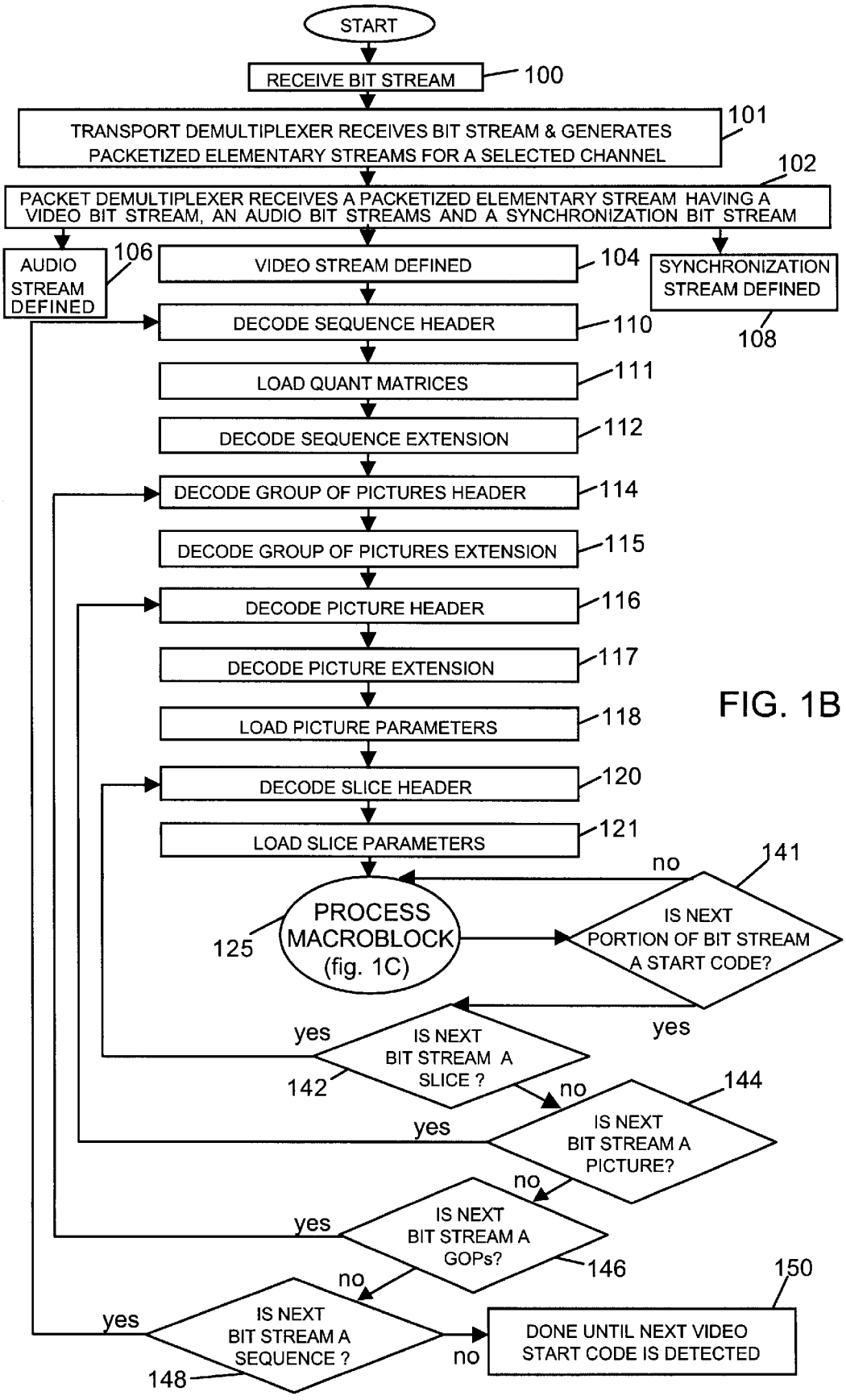

FIG. 1B

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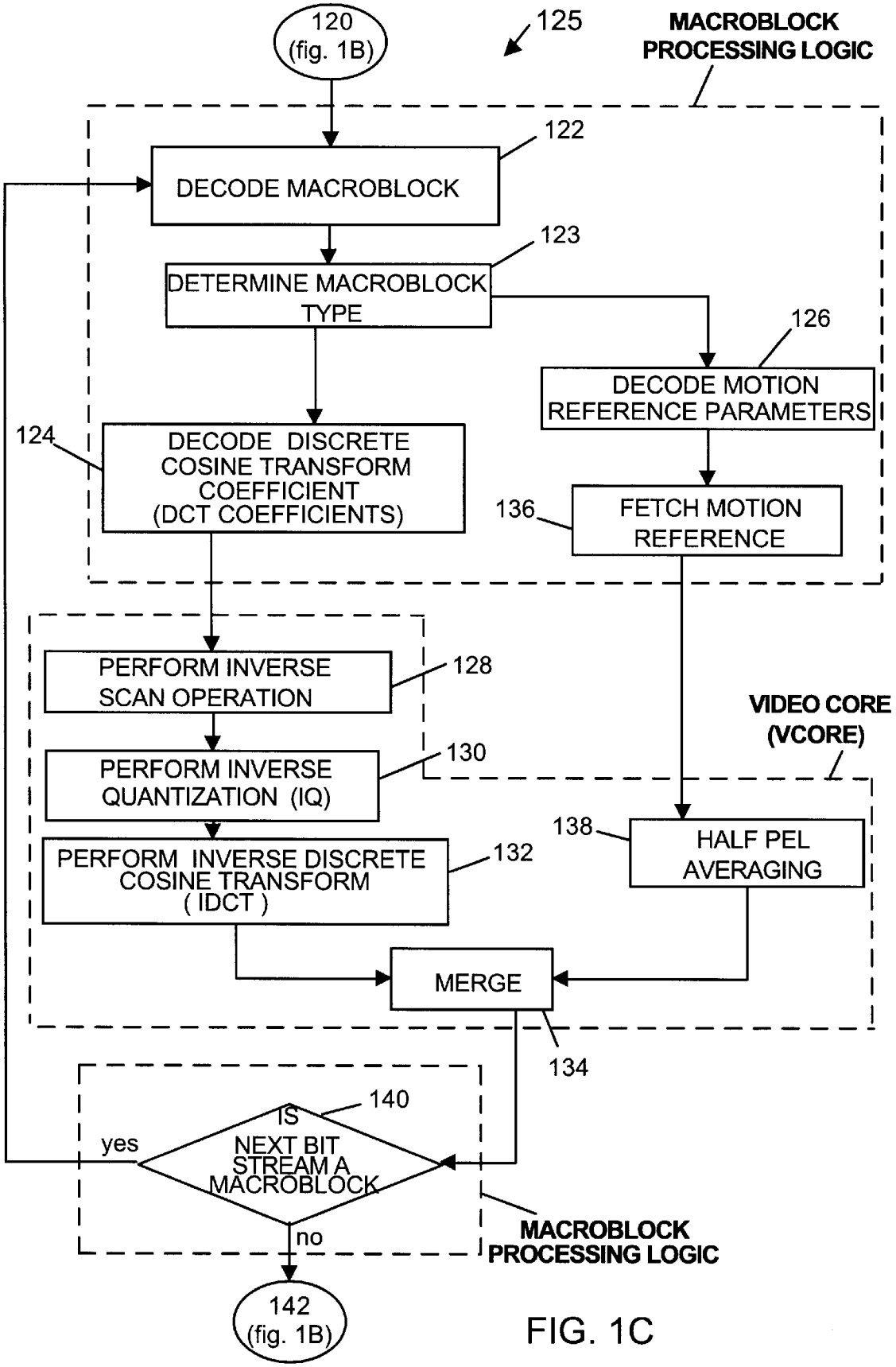

FIG. 1C

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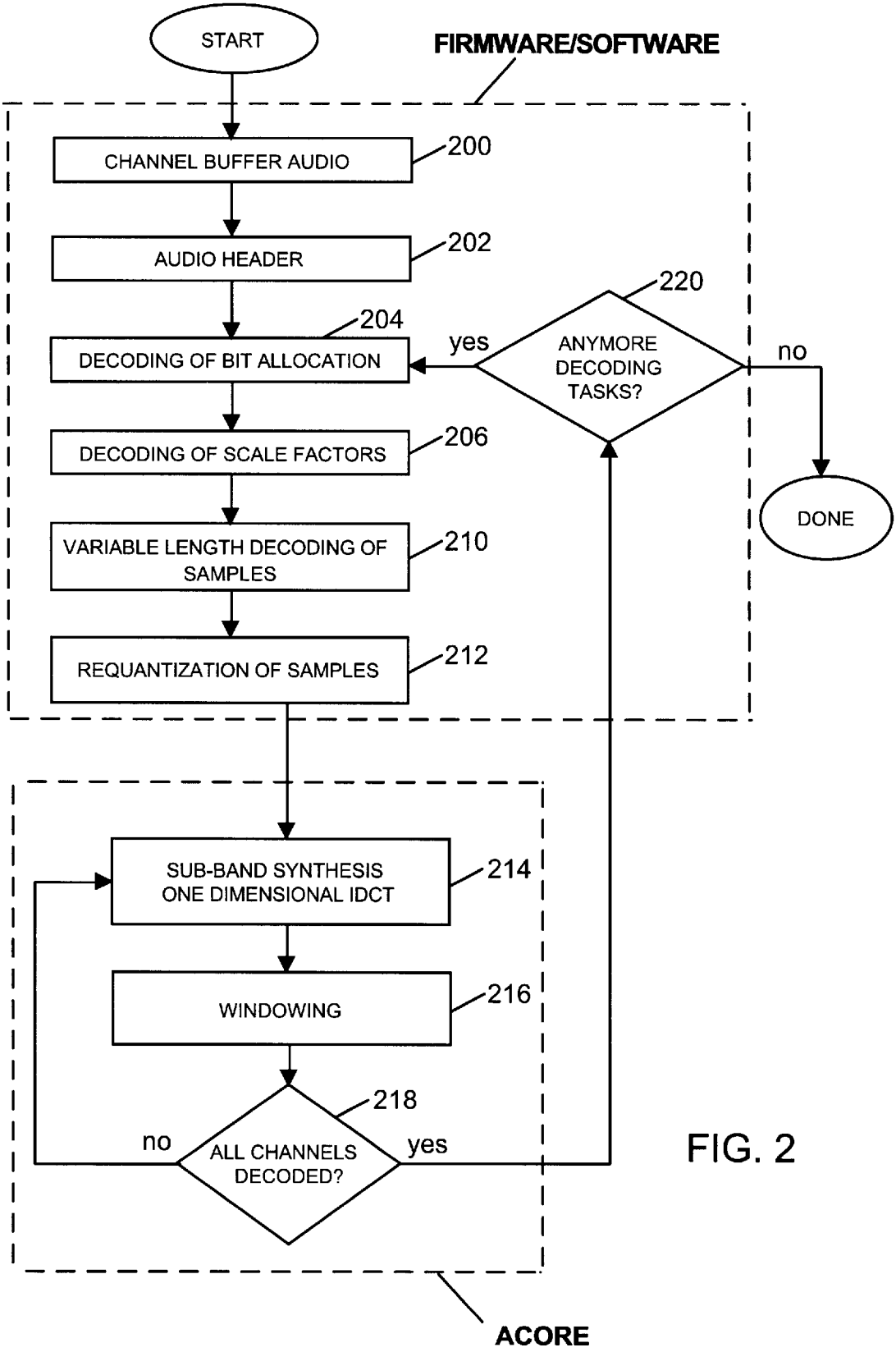

FIG. 2

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