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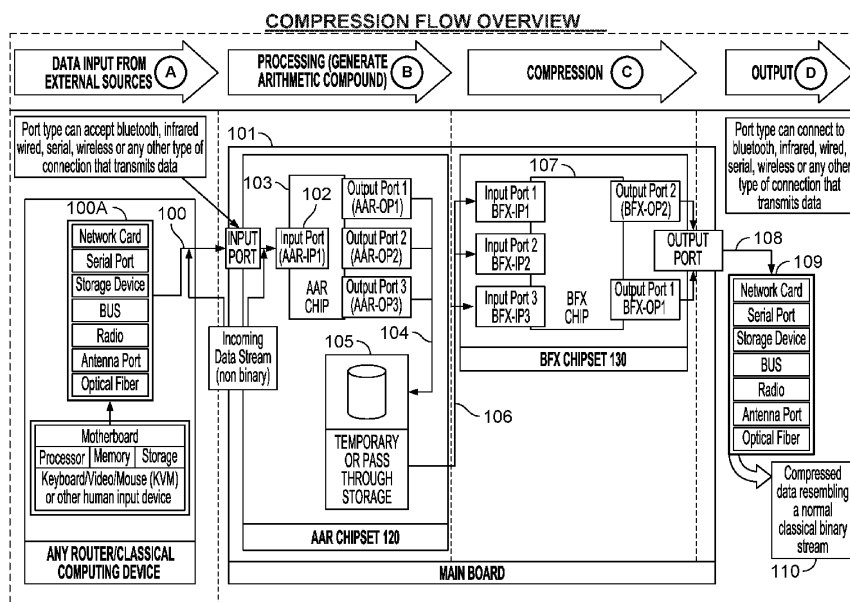


FIG. 1A

(57) Abstract: Methods, systems, and apparatus for logical reverse computing and circular compression and decompression. In one aspect, a method for compressing a classical binary data input includes obtaining a classical binary data input; performing classical operations on the classical binary data input to obtain metadata for the classical binary data input, the metadata comprising statistical operators, wherein the classical operations are based on the ensemble interpretation of quantum mechanics; applying swap gates to the metadata to compress the metadata, wherein the swap gates swap data as a one-way function and application of the swap gates is defined by values of the statistical operators; and providing the compressed metadata as a compressed classical binary data input.

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