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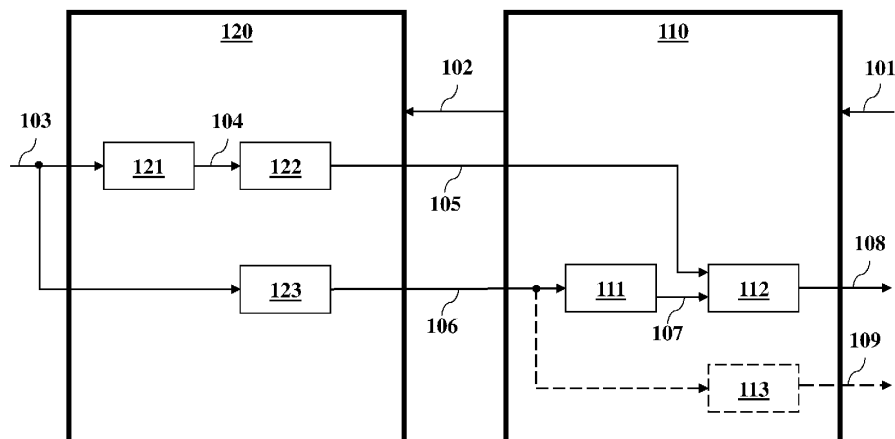


FIG. 1

(57) Abstract: This disclosure relates to semantic communications. A parent device determines one or more sub-goals based on a goal. The parent device assigns the sub-goals to one or more child devices. Each child device obtains an input, performs semantic extraction on the input to obtain intermediate features, and performs semantic processing on the intermediate features to validate the assigned sub-goal. If the sub-goal is validated, the child device sends a decision flag to its parent device. If the sub-goal cannot be validated, the child device compresses the input by using a neural network, and provide an activation vector output by the neural network to the parent device. The parent device, if receiving a decision flag, may directly validate its own goal based on the decision flag. If receiving an activation vector, the parent device performs semantic extraction and semantic processing on the activation vector to validate its own goal.

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