CLAIMS

I/We claim:

1. A reconstruction method of a cone-beam spiral Computed Tomography (CT)system, comprising steps of:

calculating a minimum row number of detectors required for covering a Tam window according to a pitch of the cone-beam spiral CT system and a row spacing of multiple rows of detectors;

compensating for the missing projection data by weighting the complementary projection data in a case that the row number of detectors of the cone-beam spiral CT system is less than the minimum row number of detectors;

rebinning the cone beam data to cone parallel beam data;

implementing cone-angle cosine weighting on the rebinned cone parallel data, and then implementing one-dimensional filtering on the data along a row direction of virtual detectors defined when the projection data is rebinned as the data of parallel beams; and

implementing cone parallel beam back projection without weighting on the filtered data, to obtain reconstructed images.

2. The method according to claim 1, wherein the step of compensating for the missing projection data by weighting the complementary projection data comprises:

when $s > s_{\max}$,

$$P(\lambda,\alpha,s) = (1-w_1)\cdot P(\lambda,\alpha,s_{\max}) + w_1 \cdot P(\lambda+\pi-2\alpha,-\alpha,s_{\min})$$

$$w_1 = \frac{AB}{AC} = \frac{s-s_{\max}}{\frac{hD(\pi-2\alpha)}{2\pi R\cos\alpha}-(s_{\max}-s_{\min})}$$

when $s < s_{\min}$,

5. The system according to claim 4, wherein the means for compensating for the missing projection data by weighting the complementary projection data comprises means for:

when $s > s_{max}$,

$$P(\lambda,\alpha,s) = (1-w_1)\cdot P(\lambda,\alpha,s_{max}) + w_1 \cdot P(\lambda+\pi-2\alpha,-\alpha,s_{min})$$

$$w_1 = \frac{AB}{AC} = \frac{s-s_{max}}{\frac{hD(\pi-2\alpha)}{2\pi R\cos\alpha}-(s_{max}-s_{min})}$$

when $s < s_{min}$,

$$P(\lambda,\alpha,s) = (1-w_2)\cdot P(\lambda,\alpha,s_{min}) + w_2 \cdot P(\lambda-\pi-2\alpha,-\alpha,s_{max})$$

$$w_2 = \frac{s_{min}-s}{\frac{hD(\pi+2\alpha)}{2\pi R\cos\alpha}-(s_{max}-s_{min})}$$

wherein, s represents a row (cone angle) directional coordinate of the detectors, α represents a column (fan angle) directional coordinate of the detectors, λ represents a projection angle, s_{min} represents a minimum row (cone angle) directional coordinate value of the detectors, s_{max} represents a maximum row (cone angle) directional coordinate value of the detectors, R represents a rotational radius of an X-ray source, h represents a distance a belt travels when a slip ring rotates in a circle, i.e., a pitch, and D represents a distance from the X-ray source to cylindrical detectors.