

(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2004/0071284 A1****Abutalebi et al.**(43) **Pub. Date: Apr. 15, 2004**(54) **METHOD AND SYSTEM FOR PROCESSING  
SUBBAND SIGNALS USING ADAPTIVE  
FILTERS****Publication Classification**(51) **Int. Cl.<sup>7</sup>** ..... **H04M 9/08**(52) **U.S. Cl.** ..... **379/406.08; 379/406.14**(76) **Inventors:** **Hamid Reza Abutalebi, Yazd (IR);  
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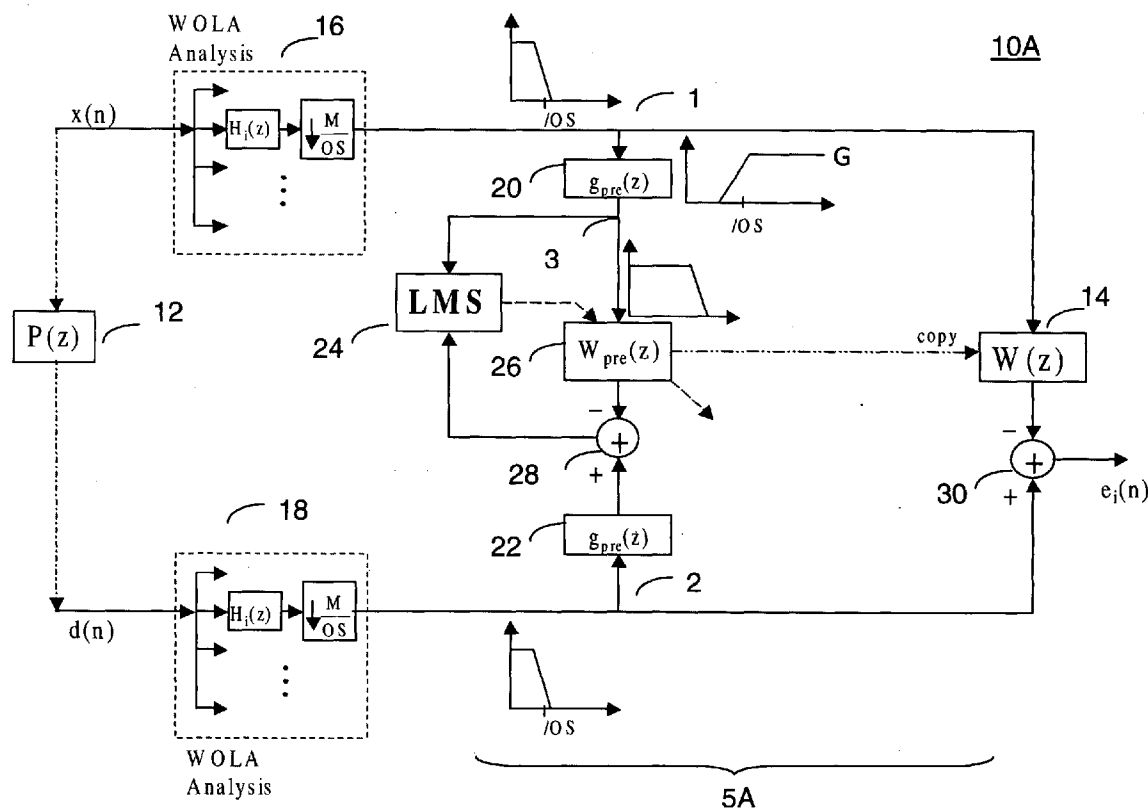
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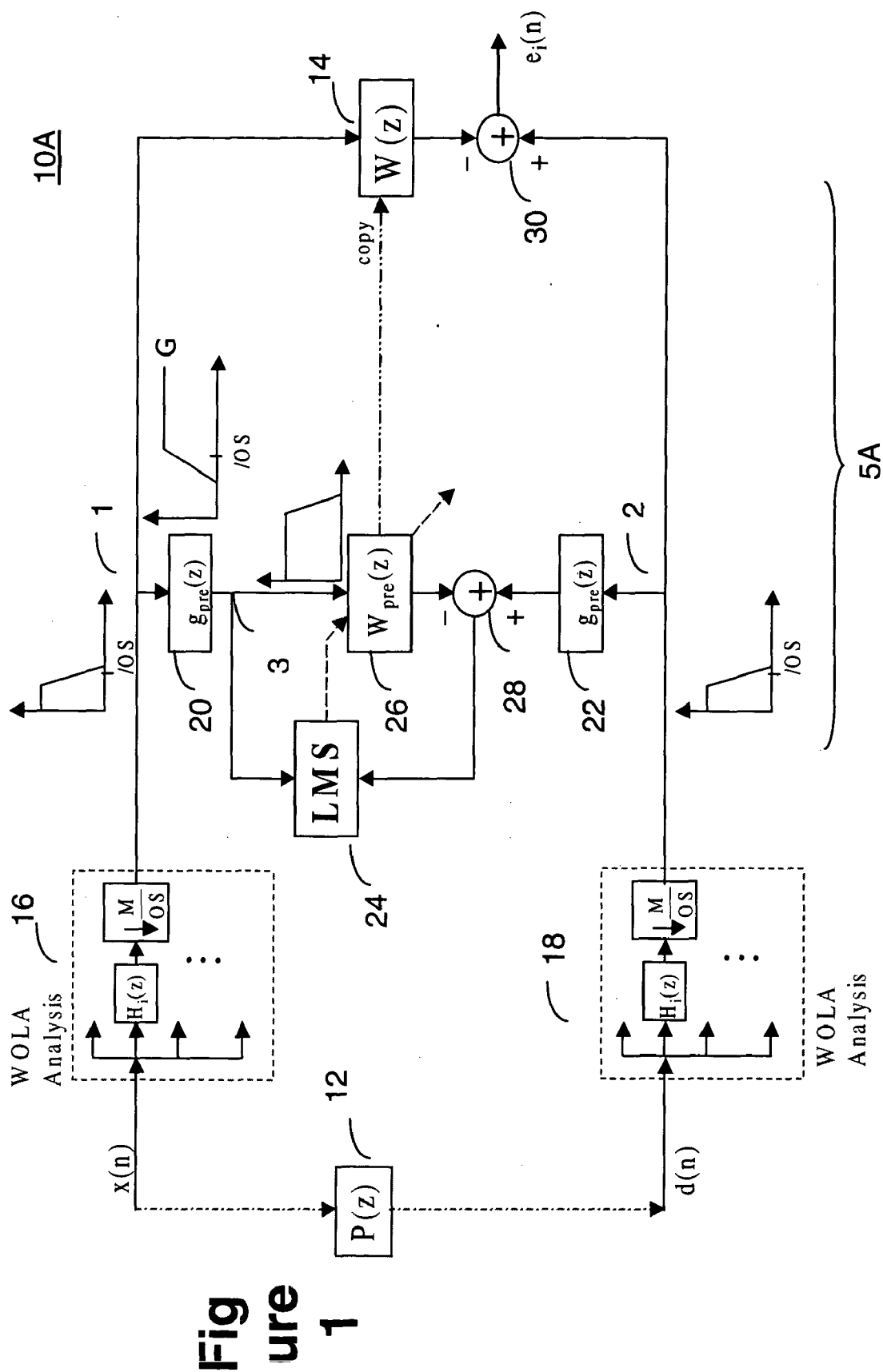
**PERMAN & GREEN****425 POST ROAD****FAIRFIELD, CT 06824 (US)**(21) **Appl. No.:** **10/642,847**(22) **Filed:** **Aug. 18, 2003**(30) **Foreign Application Priority Data**

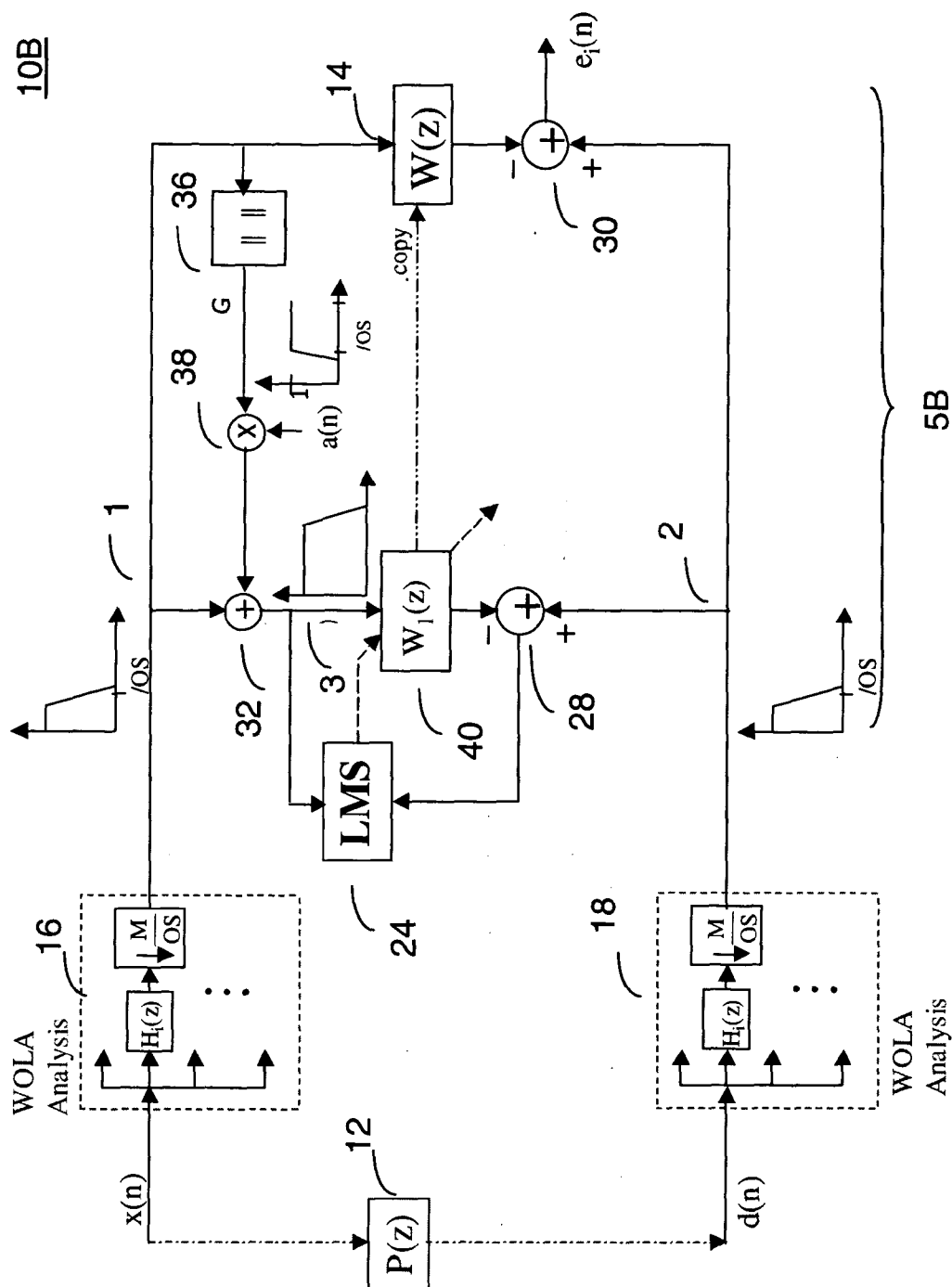
Aug. 16, 2002 (CA) ..... 2,399,159

(57) **ABSTRACT**

A method and system for processing subband signals using adaptive filters is provided. The system is implemented on an oversampled WOLA filterbank. Inputs signals are oversampled. The system includes an adaptive filter for each subband, and the functionality of improving the convergence properties of the adaptive filter. For example, the convergence property is improved by whitening the spectra of the oversampled subband signals and/or affine projection algorithm. The system is applicable to echo and/or noise cancellation. Adaptive step size control, adaptation process control using Double-Talk detector may be implemented. The system may further implement a non-adaptive processing for reducing uncorrelated noise and/or cross-talk resistant adaptive noise cancellation.

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## Figure 2

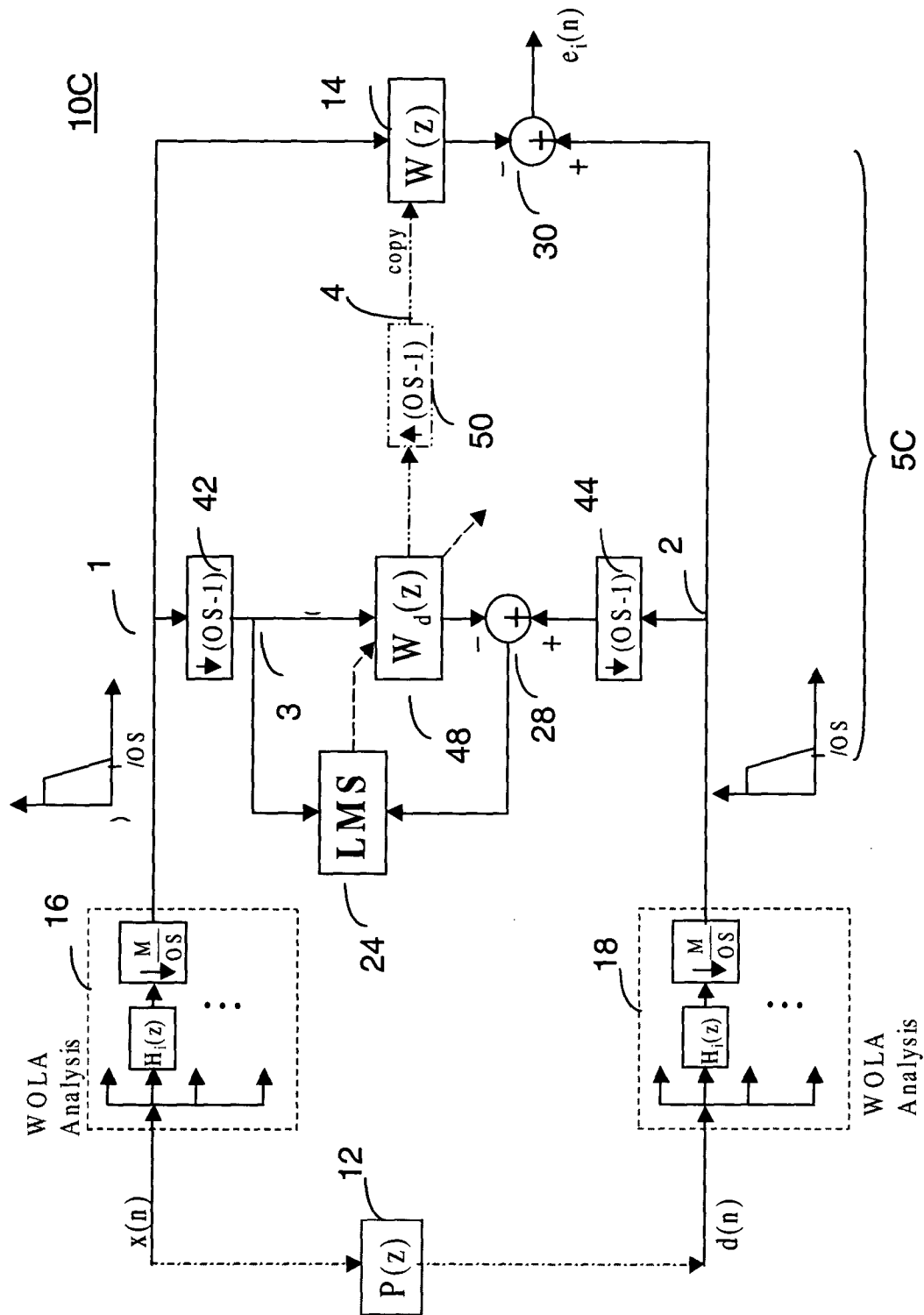


Figure 3

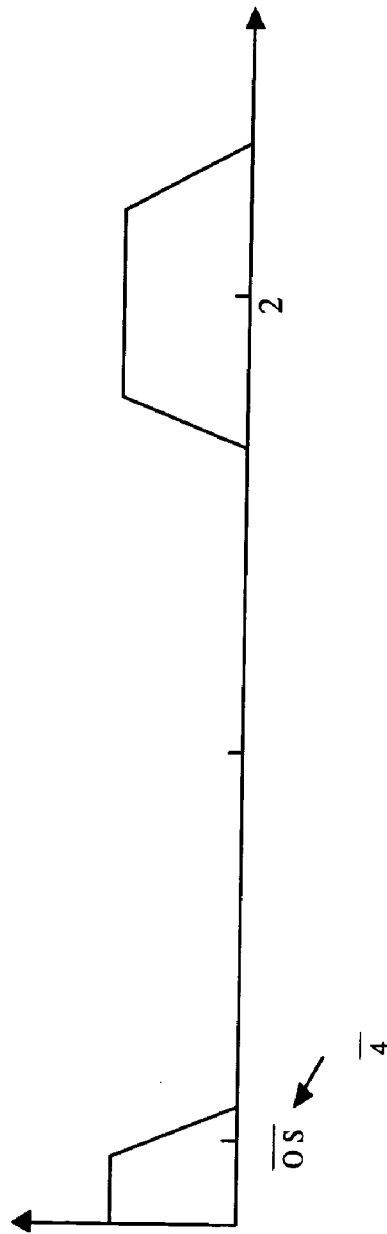


Figure 4A

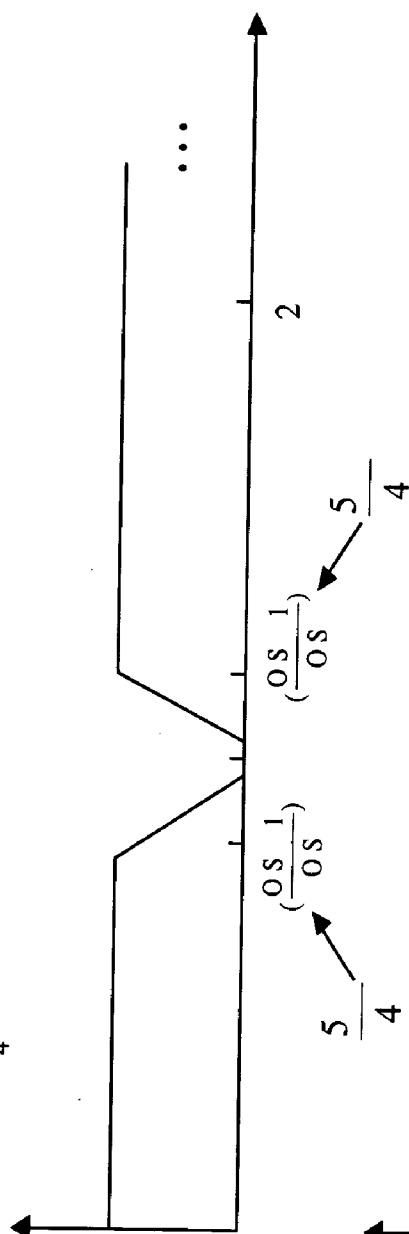


Figure 4B

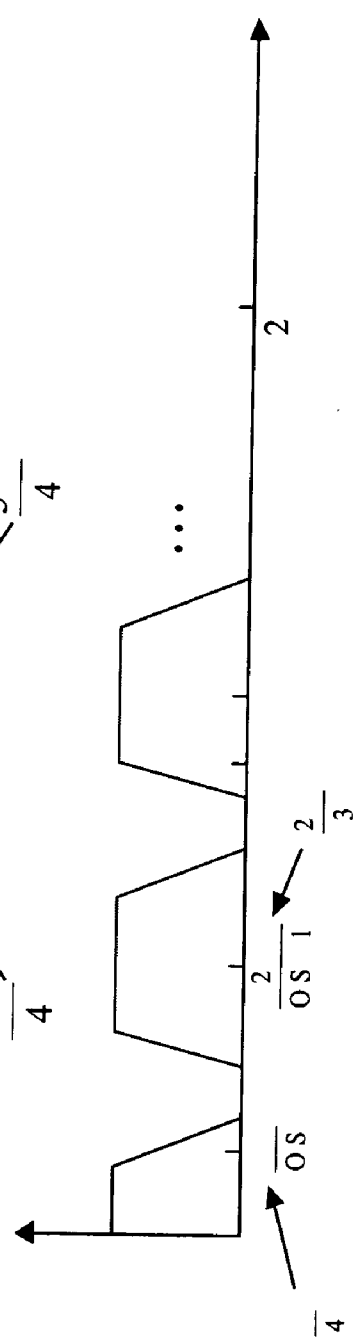


Figure 4C

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