1 $M(w)$ and $G(w)$ don't have common nonzero entries

Subtracting one on that position produces smaller counterexample.

2 $c_{i-1} \leq w$

$G(w)$ has to have nonzero entry before i-th position because $M(w) < G(w)$ and $M(w)_k = 0 \ \forall k < i$ and $M(w)_i \neq 0$ and $G(w)_i = 0$.

3 $w - c_j < c_{i-1}$

Subtracting one from minimal representation $M(w)$ on j-th position gives minimal representation $M(w - c_j) = G(w - c_j)$. It doesn't have nonzero entries before i so $w - c_j < c_{i-1}$ (greedy algorithm).

4 $G(c_{i-1} - 1) < M(w)$

Subtracting one from both vectors on i-th position gives still greedy and minimal representations respectively of $c_{i-1} - 1 - c_i$ and $w - c_i$. The second one is also greedy (smaller than smallest counterexample). But we know that $c_{i-1} - 1 - c_i < w - c_i$ so $G(c_{i-1} - 1 - c_i) < G(w - c_i)$. Now we can come back, adding one on i-th position.

5 $M(w - c_j) \leq G(c_{i-1} - 1)$

$M(w - c_j) = G(w - c_j) \leq G(c_{i-1} - 1)$