Reducing A to $MPCP$

Let $A = \{\langle M, w\rangle \mid M \text{ is a Turing machine and } M \text{ accepts } w\}$.
Let $MPCP = \{\langle P\rangle \mid P \text{ is an instance of the Post Correspondence Problem with a match that starts with the first domino}\}$.

We describe a function f that given $\langle M, w\rangle$, generates an instance P such that $\langle M, w\rangle \in A$ if and only if $P \in MPCP$.

Let $M = (Q, \Sigma, \Gamma, \delta, q_0, q_{accept}, q_{reject})$. The function f constructs P as follows:

1. Put $\left[\frac{\#}{\# q_0 w_1 w_2 \cdots w_n \#}\right]$ into P as first domino.
2. For every $a, b \in \Gamma$ and every $q, r \in Q$ where $q \neq q_{reject}$:
   if $\delta(q, a) = (r, b, R)$ put $\left[\frac{qa}{br}\right]$ in P.
3. For every $a, b, c \in \Gamma$ and every $q, r \in Q$ where $q \neq q_{reject}$:
   if $\delta(q, a) = (r, b, L)$ put $\left[\frac{cqa}{rcb}\right]$ into P.
4. For every $a \in \Gamma$:
   put $\left[\frac{a}{a}\right]$ into P.
5. Put $\left[\frac{\#}{\#}\right]$ and $\left[\frac{\#}{\sqcup\#}\right]$into P.
6. For every $a \in \Gamma$:
   put $\left[\frac{a q_{accept}}{q_{accept}}\right]$ and $\left[\frac{q_{accept} a}{q_{accept}}\right]$ into P.
7. Add $\left[\frac{q_{accept}\#\#}{\#}\right]$ to P.