519   Define relation *partmerge*: *nat*→*nat*→*bin* as follows:

$$partmerge\ 0\ 0$$
$$partmerge\ (m{+}1)\ 0\ =\ partmerge\ m\ 0\ \wedge\ \mathcal{M}c_{wc+m} = \mathcal{M}a_{ra+m}$$
$$partmerge\ 0\ (n{+}1)\ =\ partmerge\ 0\ n\ \wedge\ \mathcal{M}c_{wc+n} = \mathcal{M}b_{rb+n}$$
$$partmerge\ (m{+}1)\ (n{+}1)\ =\ \quad partmerge\ m\ (n{+}1)\ \wedge\ \mathcal{M}c_{wc+m+n+1} = \mathcal{M}a_{ra+m}$$
$$\vee\ partmerge\ (m{+}1)\ n\ \wedge\ \mathcal{M}c_{wc+m+n+1} = \mathcal{M}b_{rb+n}$$

Now *partmerge m n* says that the first $m{+}n$ outputs on channel c are a merge of m inputs from channel a and n inputs from channel b . Define *merge* as

$$merge\ =\ (a?.\ c!\ a) \vee (b?.\ c!\ b).\ merge$$

Prove *merge* $=\ (\forall m\cdot \exists n\cdot partmerge\ m\ n) \vee (\forall n\cdot \exists m\cdot partmerge\ m\ n)$

no solution given