$$\langle\{\}, \{\}, \mathit{id}, \{[a']f_n^C\langle(a\,b).X, Y\rangle \approx_? [b']f_n^C\langle(a\,c)(c\,d).X, Y\rangle\}\rangle$$

$(\approx_? \mathbf{[ab]})$

$$\langle\{\}, \{\}, \mathit{id}, \{f_n^C\langle(a\,b).X, Y\rangle \approx_? f_n^C\langle(a\,c)(c\,d)(a'\,b').X, (a'\,b').Y\rangle, \ a' \#_? f_n^C\langle(a\,c)(c\,d).X, Y\rangle\}\rangle$$

$(\approx_? \mathbf{C})$

Left branch:

$$\langle\{\}, \{\}, \mathit{id}, \{(a\,b).X \approx_? (a\,c)(c\,d)(a'\,b').X, \ Y \approx_? (a'\,b').Y, \ a' \#_? f_n^C\langle(a\,c)(c\,d).X, Y\rangle\}\rangle$$

$(\approx_? \mathbf{inv})$

$$\langle\{\}, \{\}, \mathit{id}, \{Y \approx_? (a'\,b').Y, \ a' \#_? f_n^C\langle(a\,c)(c\,d).X, Y\rangle, \ (a\,b)(a'\,b')(c\,d)(a\,c).X \approx_? X\}\rangle$$

$(\approx_? \mathbf{inv})$

$$\langle\{\}, \{\}, \mathit{id}, \{a' \#_? f_n^C\langle(a\,c)(c\,d).X, Y\rangle, \ (a\,b)(a'\,b')(c\,d)(a\,c).X \approx_? X, \ (a'\,b').Y \approx_? Y\}\rangle$$

$(\#_? \mathbf{app})$

$$\langle\{\}, \{\}, \mathit{id}, \{a' \#_? \langle(a\,c)(c\,d).X, Y\rangle, \ (a\,b)(a'\,b')(c\,d)(a\,c).X \approx_? X, \ (a'\,b').Y \approx_? Y\}\rangle$$

$(\#_? \mathbf{pair})$

$$\langle\{\}, \{\}, \mathit{id}, \{a' \#_? (a\,c)(c\,d).X, \ a' \#_? Y, \ (a\,b)(a'\,b')(c\,d)(a\,c).X \approx_? X, \ (a'\,b').Y \approx_? Y\}\rangle$$

$(\#_? \mathbf{var})$

$$\langle\{a'\#X\}, \{\}, \mathit{id}, \{a' \#_? Y, \ (a\,b)(a'\,b')(c\,d)(a\,c).X \approx_? X, \ (a'\,b').Y \approx_? Y\}\rangle$$

$(\#_? \mathbf{var})$

$$\langle\{a'\#Y, \ a'\#X\}, \{\}, \mathit{id}, \{(a\,b)(a'\,b')(c\,d)(a\,c).X \approx_? X, \ (a'\,b').Y \approx_? Y\}\rangle$$

$(\top)$

Right branch:

$$\langle\{\}, \{\}, \mathit{id}, \{(a\,b).X \approx_? (a'\,b').Y, \ Y \approx_? (a\,c)(c\,d)(a'\,b').X, \ a' \#_? f_n^C\langle(a\,c)(c\,d).X, Y\rangle\}\rangle$$

$(\approx_? \mathbf{inst})$

$$\langle\{\}, \{\}, X/(a'\,b')(a\,b).Y, \{Y \approx_? (a'\,b')(a\,b)(a\,c)(c\,d)(a'\,b').Y, \ a' \#_? f_n^C\langle(a'\,b')(a\,b)(a\,c)(c\,d).Y, Y\rangle\}\rangle$$

$(\approx_? \mathbf{inv})$

$$\langle\{\}, \{\}, X/(a'\,b')(a\,b).Y, \{a' \#_? f_n^C\langle(a'\,b')(a\,b)(a\,c)(c\,d).Y, Y\rangle, \ (a'\,b')(c\,d)(a\,c)(a\,b)(a'\,b').Y \approx_? Y\}\rangle$$

$(\#_? \mathbf{app})$

$$\langle\{\}, \{\}, X/(a'\,b')(a\,b).Y, \{a' \#_? \langle(a'\,b')(a\,b)(a\,c)(c\,d).Y, Y\rangle, \ (a'\,b')(c\,d)(a\,c)(a\,b)(a'\,b').Y \approx_? Y\}\rangle$$

$(\#_? \mathbf{pair})$

$$\langle\{\}, \{\}, X/(a'\,b')(a\,b).Y, \{a' \#_? (a'\,b')(a\,b)(a\,c)(c\,d).Y, \ a' \#_? Y, \ (a'\,b')(c\,d)(a\,c)(a\,b)(a'\,b').Y \approx_? Y\}\rangle$$

$(\#_? \mathbf{var})$

$$\langle\{b'\#Y\}, \{\}, X/(a'\,b')(a\,b).Y, \{a' \#_? Y, \ (a'\,b')(c\,d)(a\,c)(a\,b)(a'\,b').Y \approx_? Y\}\rangle$$

$(\#_? \mathbf{var})$

$$\langle\{a'\#Y, \ b'\#Y\}, \{\}, X/(a'\,b')(a\,b).Y, \{(a'\,b')(c\,d)(a\,c)(a\,b)(a'\,b').Y \approx_? Y\}\rangle$$

$(\top)$