



Figure 7: Extended step of encryption.

Observe that we can apply Lemma 3 to states 1, 2, 3. We also added cluster that consists of states 4, 5, 6, 7 so we can apply Lemma 4. In the former method we had that  $Q_1 = \{1a, \dots, 15a\}$ ,  $Q_2 = \{1b, \dots, 15b\}$ ,  $Q_3 = \{1c, \dots, 15c\}$  and now  $Q'_1 = Q_1 \cup \{1\}$ ,  $Q'_2 = Q_2 \cup \{2, 4, 5\}$ ,  $Q'_3 = Q_3 \cup \{3, 6, 7\}$ .

## 6 Conclusions and further work

We proposed a method of utilizing careful synchronization to provide brand new public key cryptosystem. In sections 3 and 4 we presented core idea of our method and provided an example that illustrates it. As the ciphertext in that method consists of  $n$  copies of the same automaton, those two sections are included to so the reader could understand the method presented in section 5. It should be also mentioned that lemmas 4 and 3 are only examples of extensions of that cryptosystem. Indeed, observe that Lemma 4 provides a possibility to add "free"  $a$ -clusters to a ciphertext. The disadvantage of that extension is that