Figure 5.11   Semijoin of Staff and Branch relations.

5.1.4 Division Operation

The Division operation is useful for a particular type of query that occurs quite fre-
quently in database applications. Assume that relation R is defined over the
attribute set A and relation S is defined over the attribute set B such that $B \subseteq A$ (B
is a subset of A). Let $C = A - B$, that is, C is the set of attributes of R that are not
attributes of S. We have the following definition of the Division operation.

R ÷ S	The Division operation defines a relation over the attributes C that con-sists of the set of tuples from R that match the combination of **every** tuple in S.

We can express the Division operation in terms of the basic operations:

$$T_1 \leftarrow \Pi_C(R)$$

$$T_2 \leftarrow \Pi_C((T_1 \times S) - R)$$

$$T \leftarrow T_1 - T_2$$