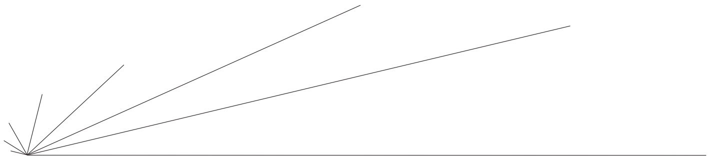

Figure 1.3.3: (A) locally connected fan F_ω

1.3.2 Simple examples

The simplest examples of dendrites are the arc and n-ods for $n \in \{3, 4, \dots\}$. All they are trees. By a tree we mean a dendrite with finitely many end points, or equivalently, a dendrite containing no points of order ω and having the set of all ramification points finite.

1.3.3 The locally connected fan

Another simple example is the *locally connected fan* F_ω. It is defined as the union of countably many straight line segments of length tending to 0, emanating from a point p and disjoint out of p. Thus F_ω is the dendrite with only one ramification point whose order is ω.

The following mapping properties of F_ω are known.

1. F_ω is universal in the class of all n-ods for $n \in \mathbb{N}$.
2. Each open image of F_ω is homeomorphic to F_ω, [Charatonik et al. 1990, Proposition 9.4, p. 42].
3. A confluent mapping defined on F_ω is open if and only if it is light, [Charatonik et al. 1990, Theorem 9.6, p. 42].

1.3.4 The locally connected combs

The next two examples are defined in [Arévalo et al. 2001, p. 3]. Let $\overline{pq}$ stand for the straight line segment from p to q in the plane. In the plane, let $a = (0, 0), a_n = (1/n, 1/n), b_n = (1/n, 0)$ for each $n \in \mathbb{N}$, and $c = (-1, 0)$. Define

$$W_R = \overline{ab_1} \cup \bigcup\{\overline{a_n b_n} : n \in \mathbb{N}\} \quad \text{and} \quad W = \overline{ca} \cup W_R.$$

The dendrites W_R and W are called the *comb* W_R and the *comb* W , or (generally) *locally connected combs* .

See Figures A–B.

The dendrites F_ω, W_R and W are exploited in the following characterizations.

1. A dendrite is a tree if and only if it contains neither a copy of F_ω nor of W_R, [Arévalo et al. 2001, Theorem 3.1, p. 3].