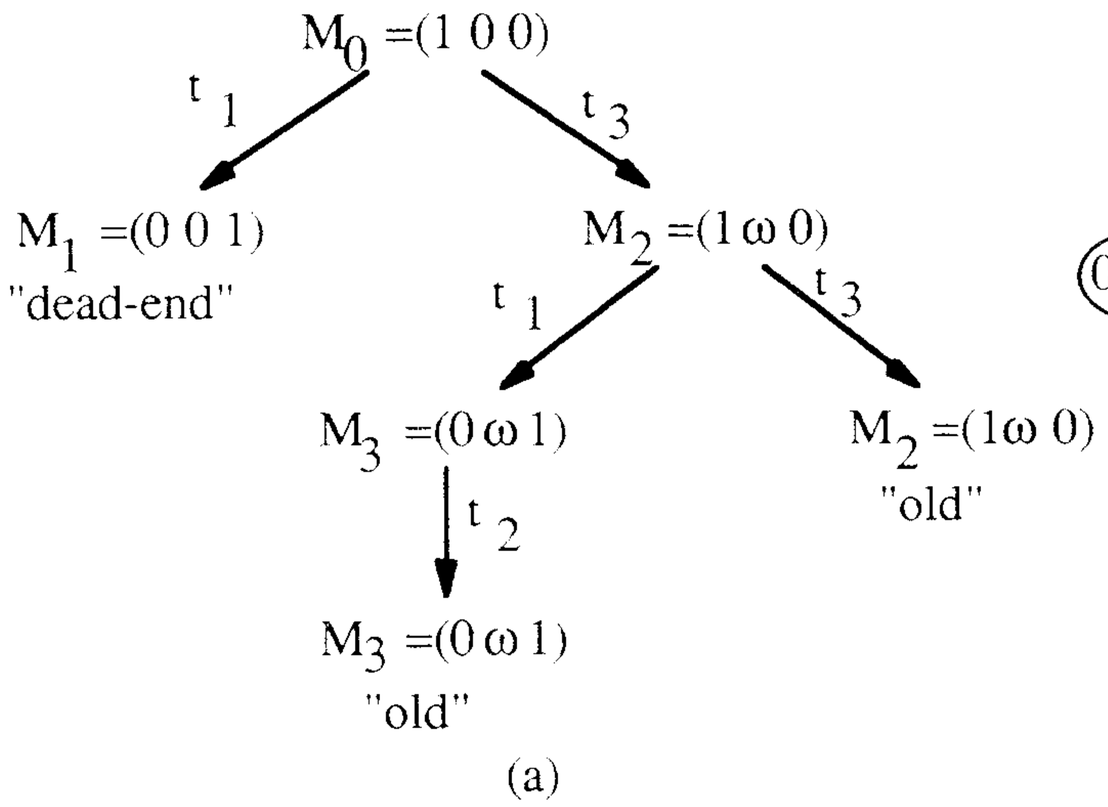

Fig. 4.1 (a) The coverability tree of the net shown in Fig. 3.2. (b) The coverability graph of the net shown in Fig. 3.2.

Properties that can be studied by using the coverability tree T for a Petri net (N, M_0) include the following.

1. A net (N, M_0) is bounded and thus $R(M_0)$ is finite *iff* (if and only if) ω does not appear in any node label in T.
2. A net (N, M_0) is safe *iff* only 0's and 1's appear in node labels in T.
3. A transition t is dead *iff* it does not appear as an arc label in T.
4. If M is reachable from M_0, then there exists a node labeled M' such that $M \leq M'$.

For a bounded Petri net, the coverability tree is called the *reachability tree* since it contains all possible reachable markings. In this case, all the analysis problems discussed in Chapter 3 can be solved by the reachability tree, as long as the size of a net is small enough. However, in general, because of the information lost by the use of the symbol ω (which may represent only even or odd numbers, may not always represent an increasing number, etc.), the reachability and liveness problems can not be solved by the coverability tree method alone.