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Ala-Laurila et al.

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(54) **TRANSFER OF SECURITY ASSOCIATION DURING A MOBILE TERMINAL HANDOVER**

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(58) Field of Search 455/411, 435–439; 380/247, 248, 270–273; 370/331, 332

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,204,902 A	*	4/1993	Reeds, III et al.	380/23
5,237,612 A	*	8/1993	Raith	380/23
5,598,459 A	*	1/1997	Haartsen	379/58
5,778,075 A		7/1998	Haartsen	380/49
6,014,085 A	*	1/2000	Patel	340/825.34
6,026,293 A	*	2/2000	Osborn	455/411
6,370,380 B1	*	4/2002	Norefors et al.	455/436

FOREIGN PATENT DOCUMENTS

EP	0 939 519 A1	9/1999
WO	WO 00/49827	8/2000

(57) **ABSTRACT**

An existing security association is re-established when a communication handover event occurs in a radio communications system such as IEEE 082.11 or a HIPERLAN wherein the existing security association between a mobile terminal and a wireless communication network is maintained when the communication handover occurs within the network. Authentication during a handover event is achieved by a challenge/response procedure. In accordance with the challenge/response procedure each member of a communication pair that is made up of a new access point and the mobile terminal that is experiencing a handover to the new access point sends a challenge to the other member of the communication pair. Each member of the communication pair then calculates a response to its received challenge, and these responses are sent back to the other member of the communication pair. Each member of the communication pair then compares its received response to a correct response. When these comparisons are correct, payload communication begins between the second access point and the mobile terminal.
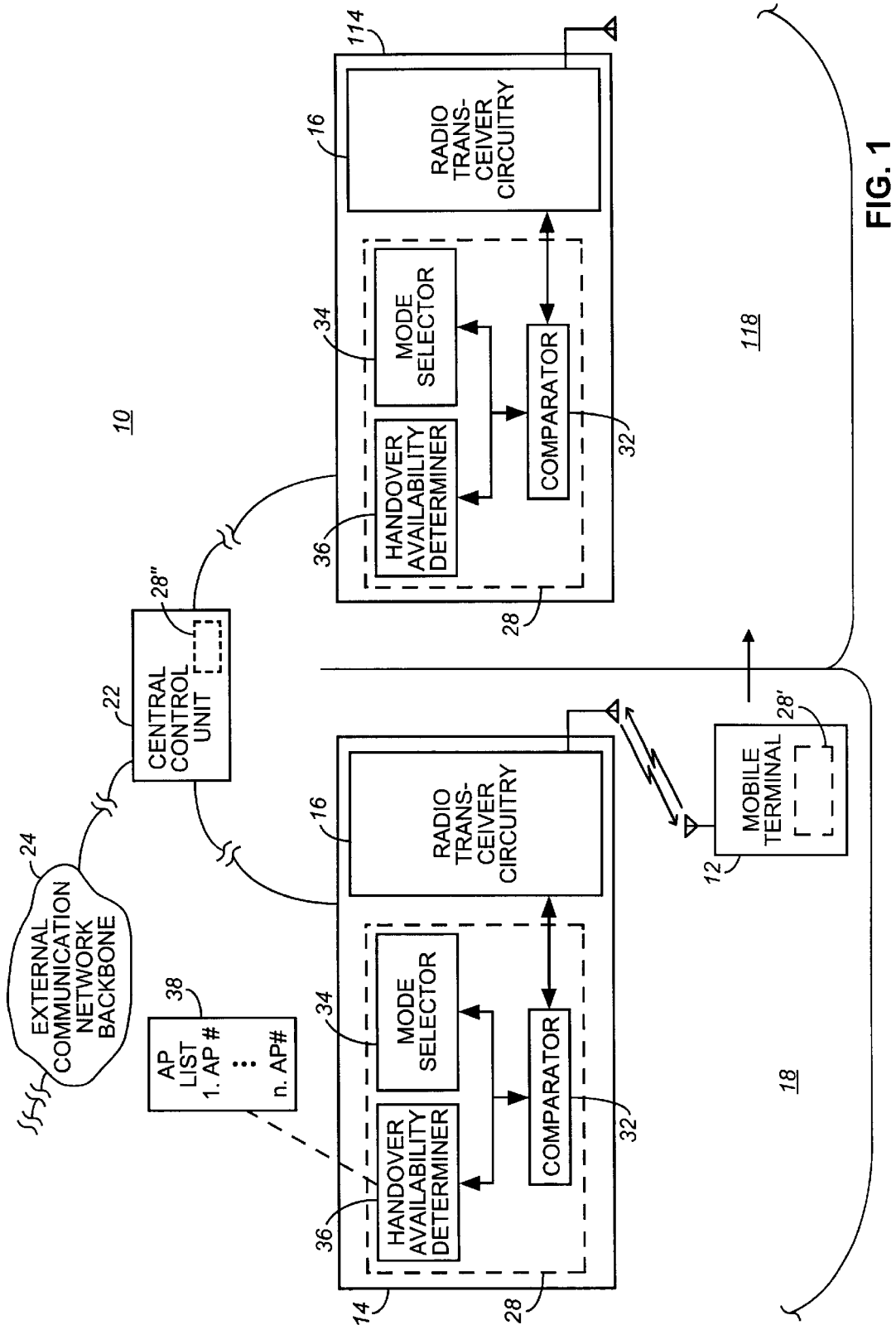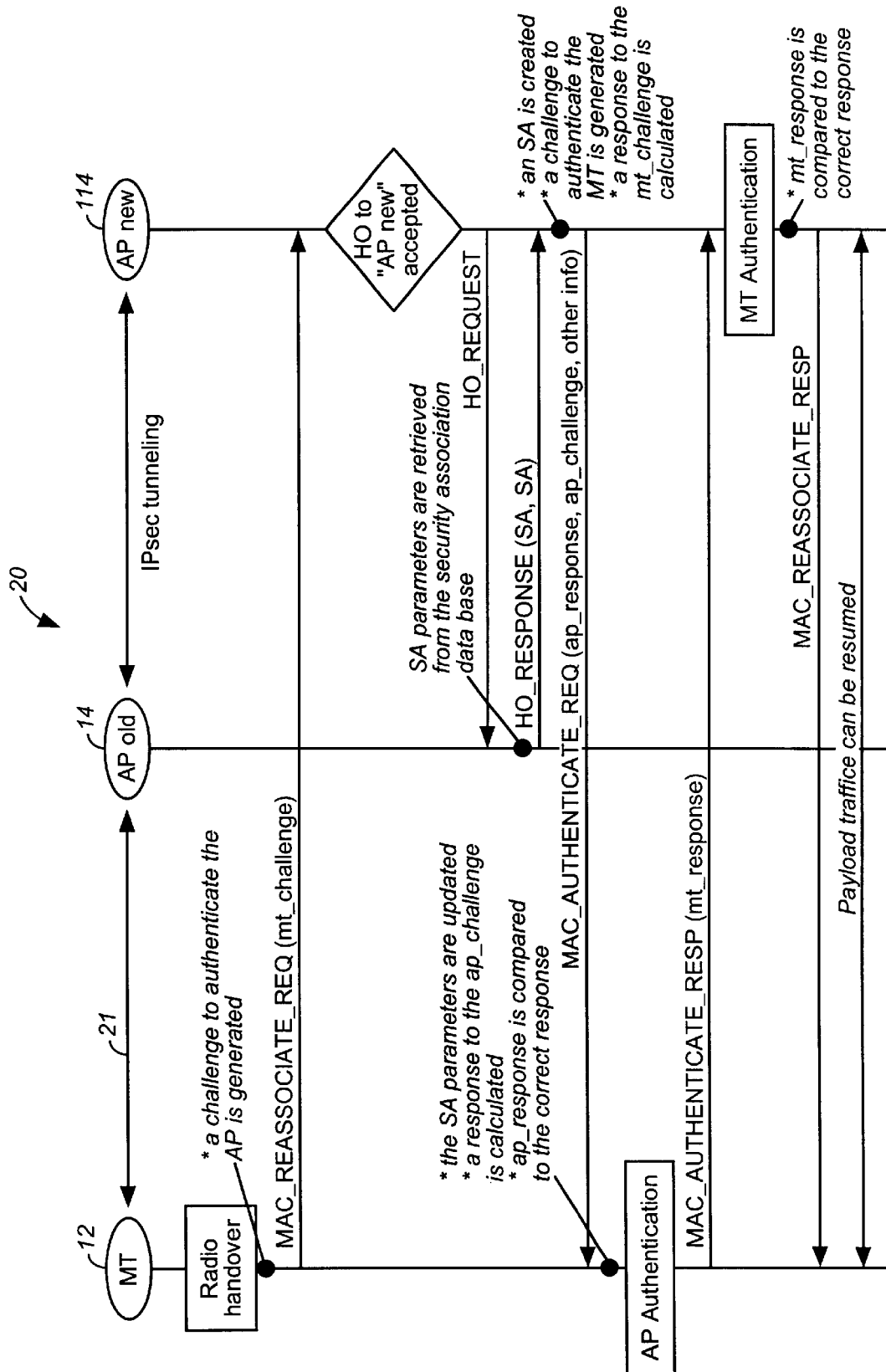
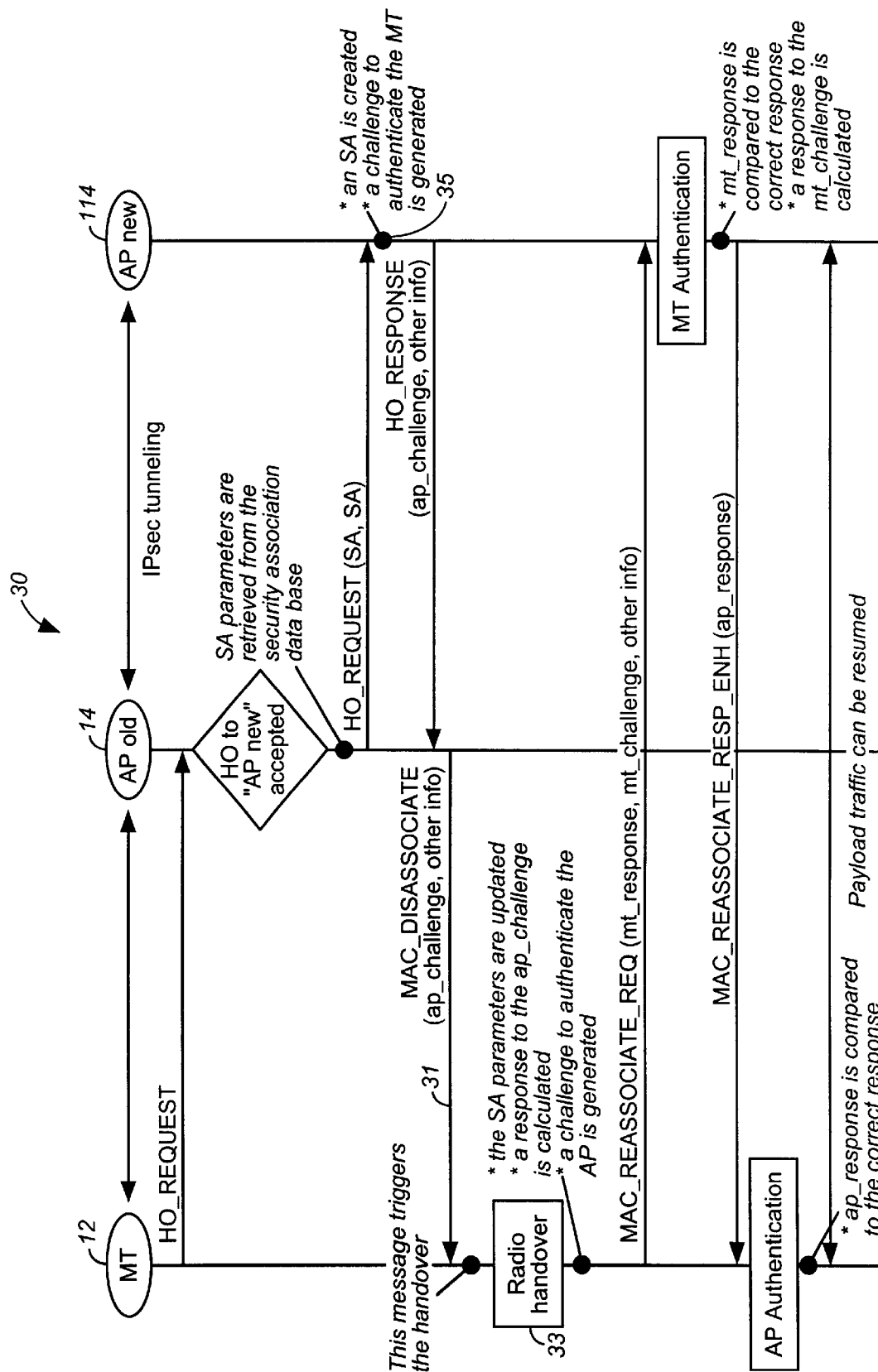**20 Claims, 11 Drawing Sheets**
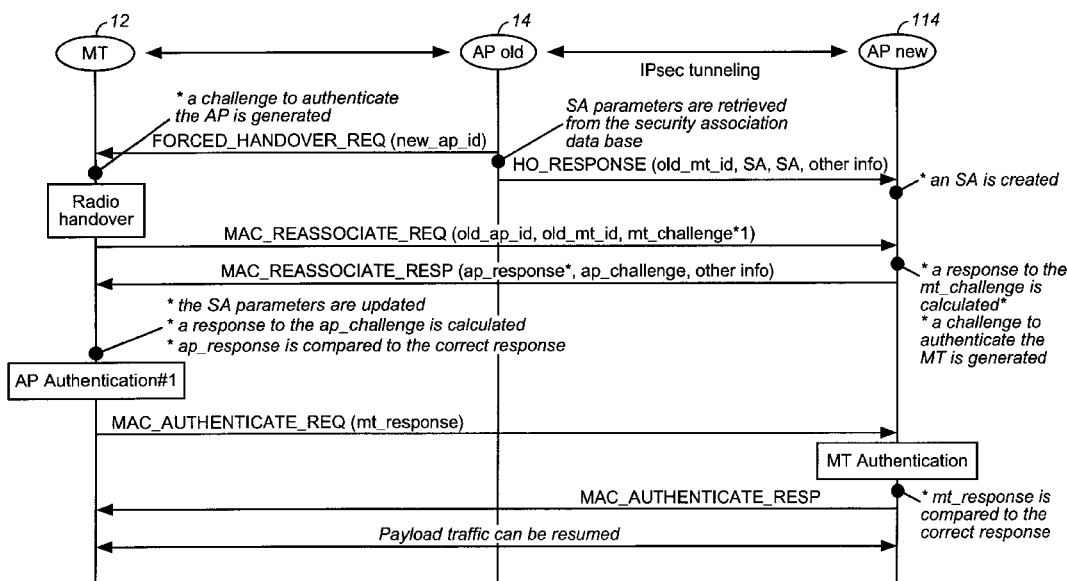
FIG. 1

FIG. 2

FIG. 3

FIG. 4A

DOCKET ALARM
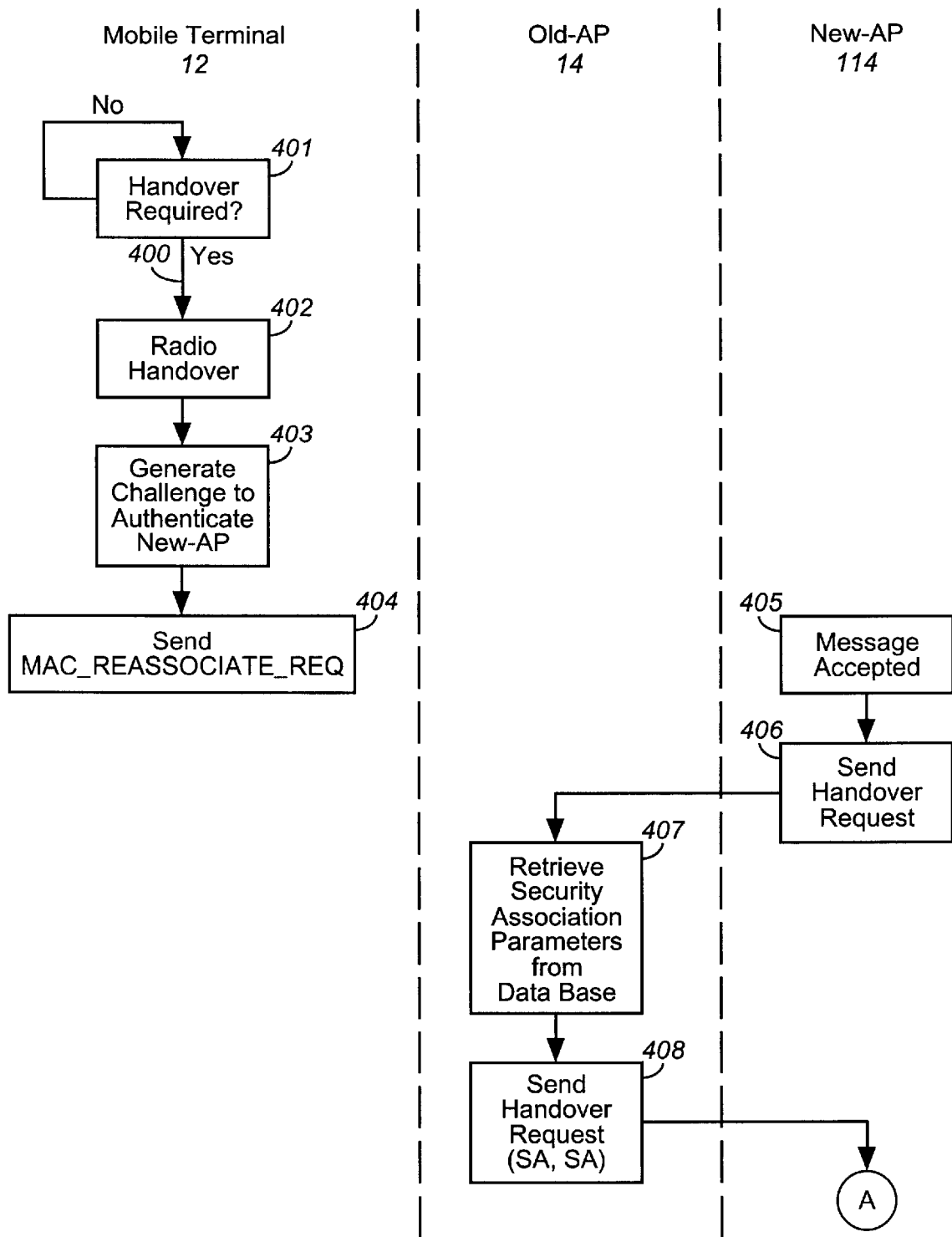
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