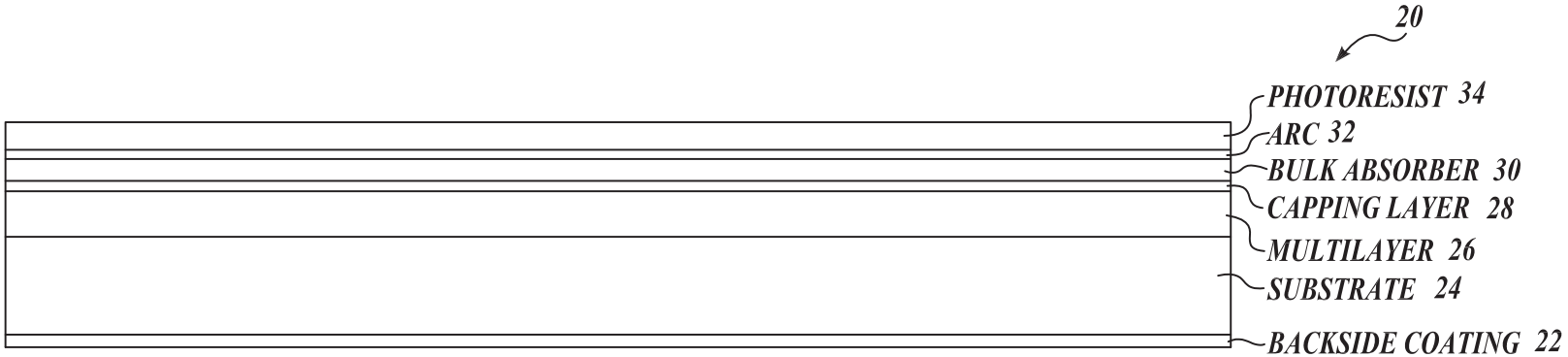
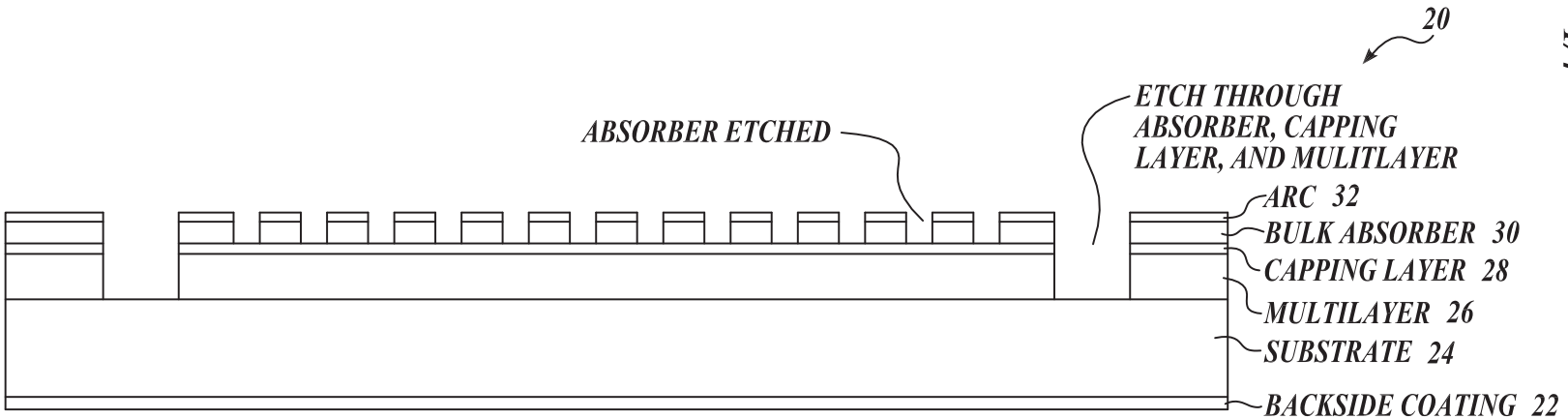


EUVL MASK BLANK

FIG. 1



FABRICATED EUVL MASK

FIG. 2

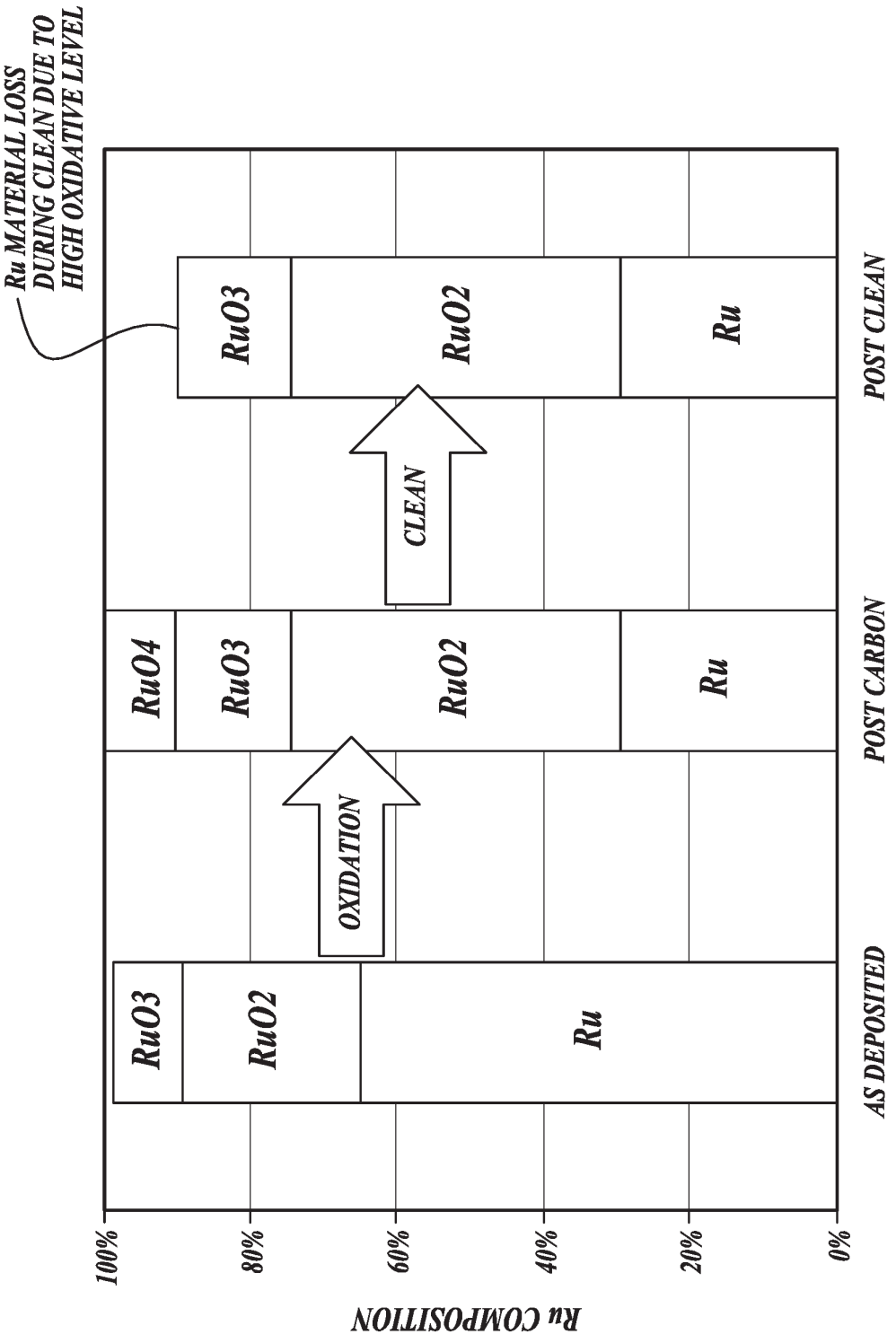

Ru MATERIAL LOSS
DURING CLEAN DUE TO
HIGH OXIDATIVE LEVEL
RuO3
RuO2
Ru
CLEAN
RuO4
RuO3
RuO2
Ru
OXIDATION
RuO3
RuO2
Ru
POST CLEAN
POST CARBON
REMOVAL
AS DEPOSITED
100%
80%
60%
40%
20%
0%
Ru COMPOSITION

FIG. 3

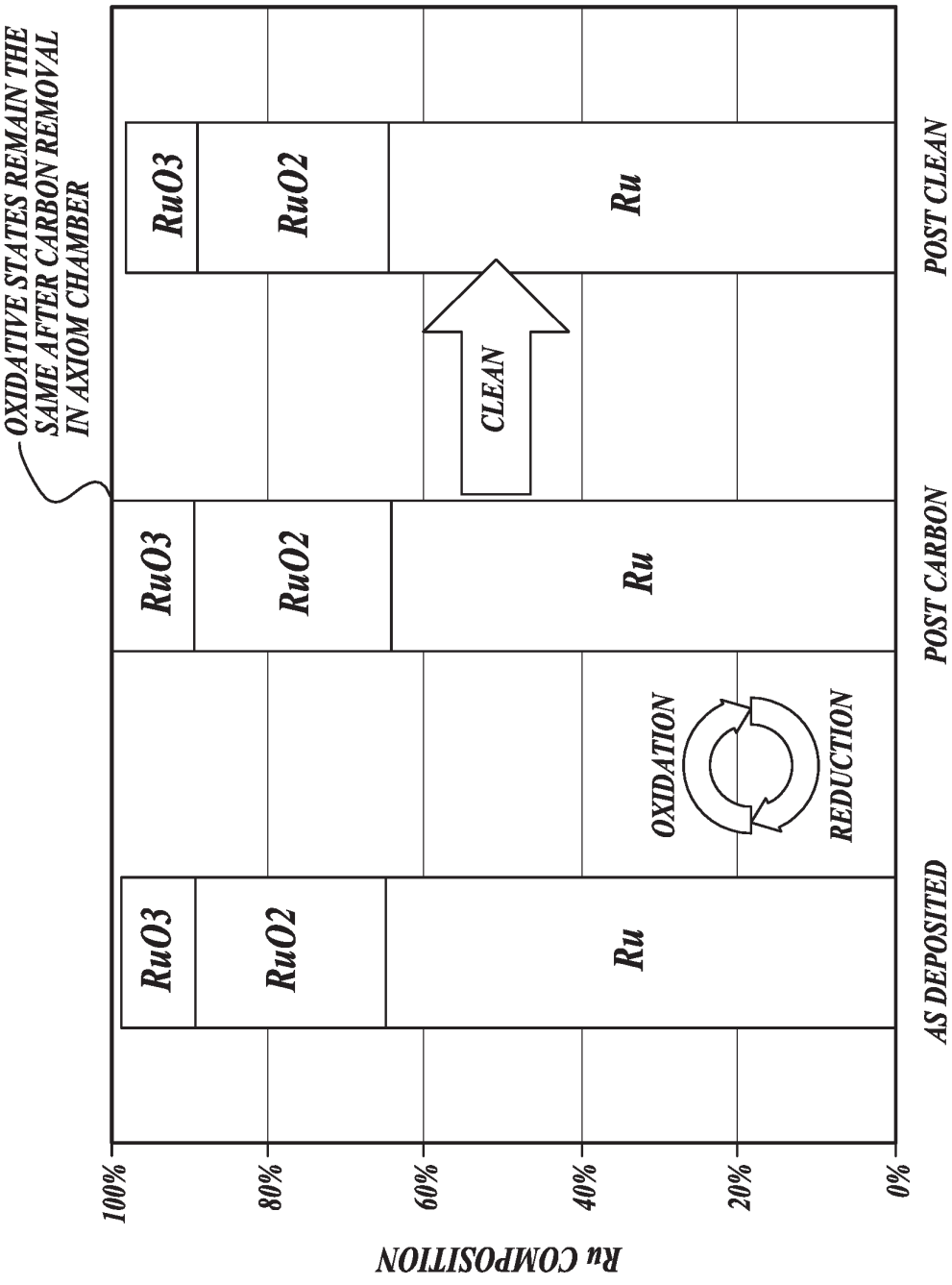

OXIDATIVE STATES REMAIN THE SAME AFTER CARBON REMOVAL IN AXIOM CHAMBER
RuO3
RuO2
Ru
CLEAN
OXIDATION
REDUCTION
AS DEPOSITED
POST CARBON REMOVAL
POST CLEAN
100%
80%
60%
40%
20%
0%
Ru COMPOSITION

FIG. 4

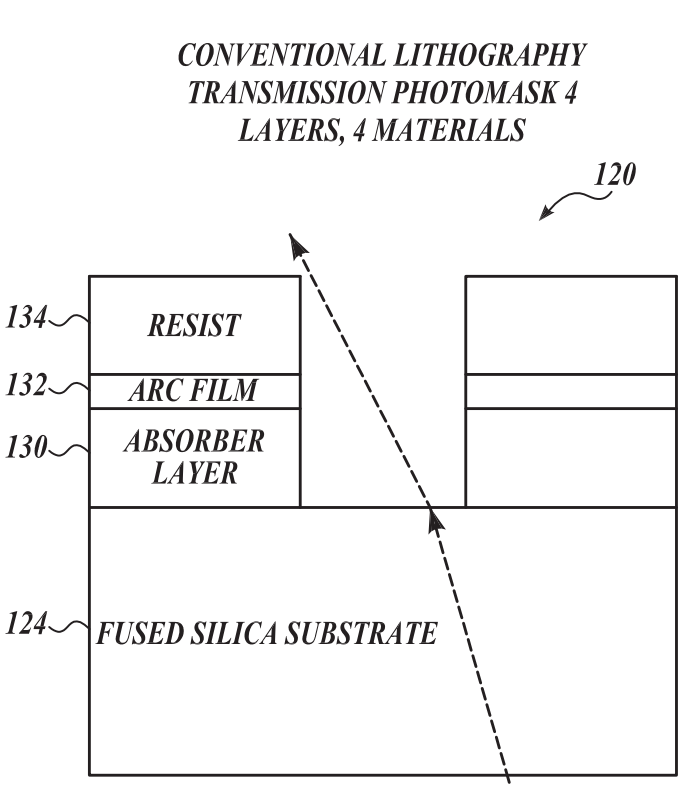

CONVENTIONAL LITHOGRAPHY
TRANSMISSION PHOTOMASK 4
LAYERS, 4 MATERIALS
120
134
RESIST
132
ARC FILM
130
ABSORBER
LAYER
124
FUSED SILICA SUBSTRATE
SHORT EUV WAVELENGTH WOULD BE
ABSORBED IN A TRANSMISSION MASK

FIG. 5A

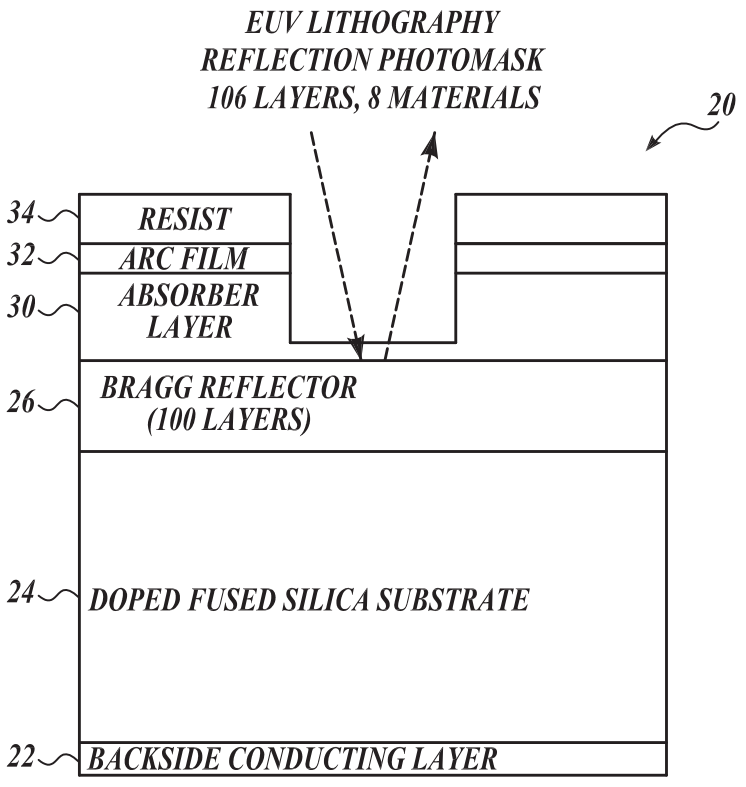

EUV LITHOGRAPHY
REFLECTION PHOTOMASK
106 LAYERS, 8 MATERIALS
20
34
RESIST
32
ARC FILM
30
ABSORBER
LAYER
26
BRAGG REFLECTOR
(100 LAYERS)
24
DOPED FUSED SILICA SUBSTRATE
22
BACKSIDE CONDUCTING LAYER
SHORT EUV WAVELENGTH WOULD BE
REFLECTED IN A REFLECTION MASK

FIG. 5B