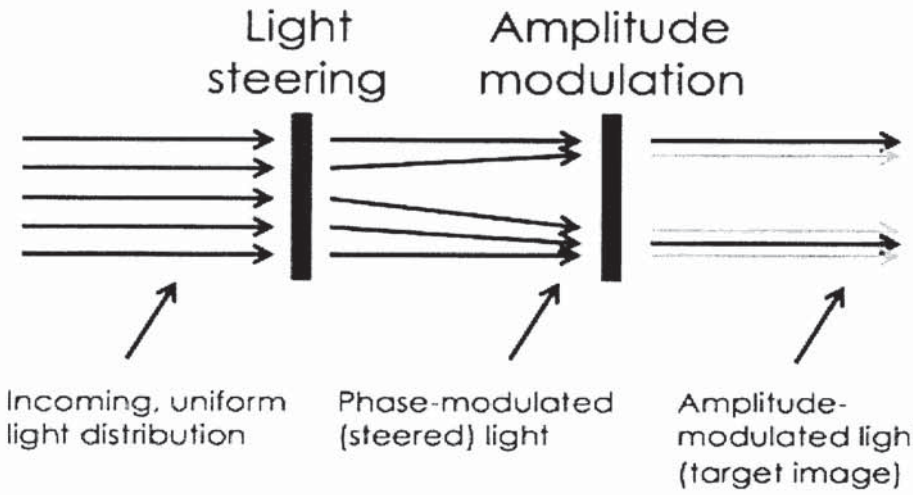

FIG. 1

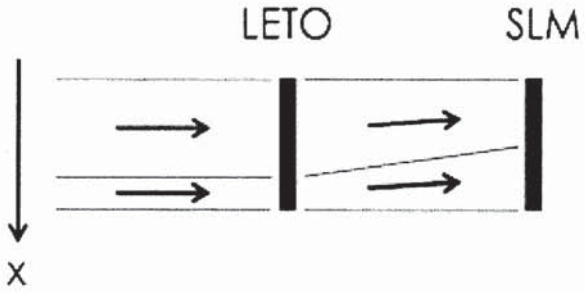

FIG. 2A Spatial illustration of incoming uniform light distribution

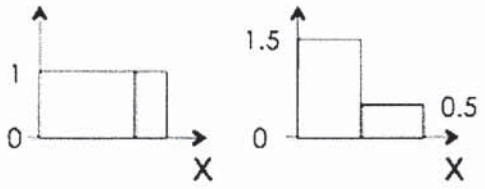

FIG. 2B Intensity distribution across beam

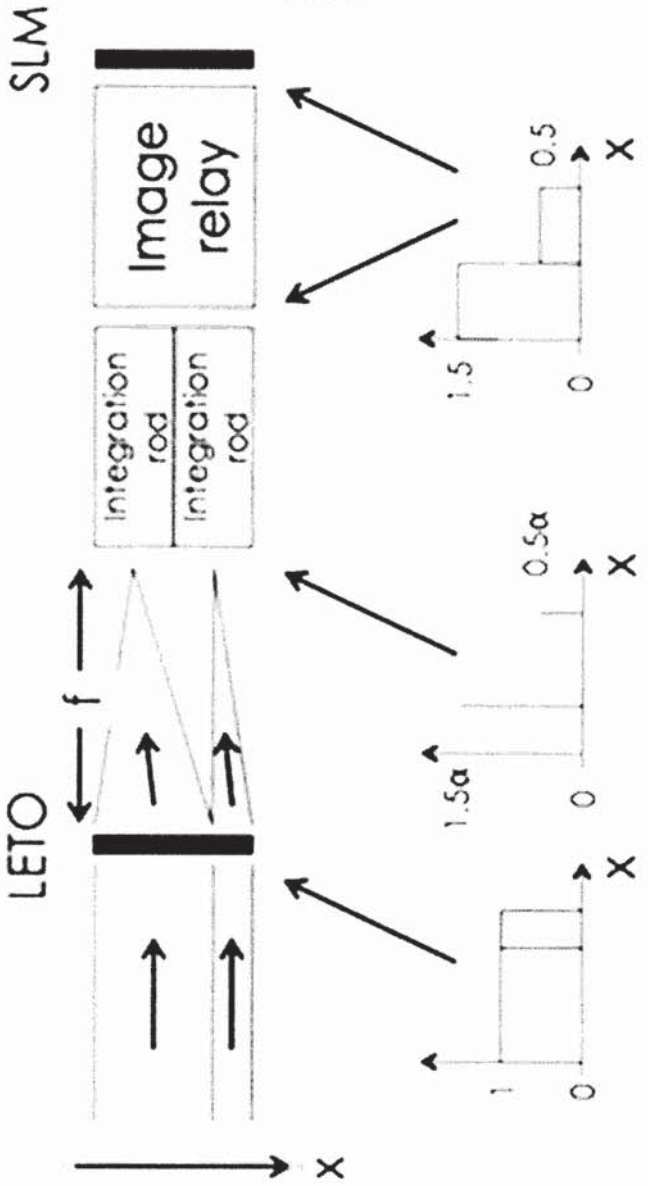

FIG. 3A Spatial illustration of incoming uniform light distribution

FIG. 3B Intensity distribution across beam

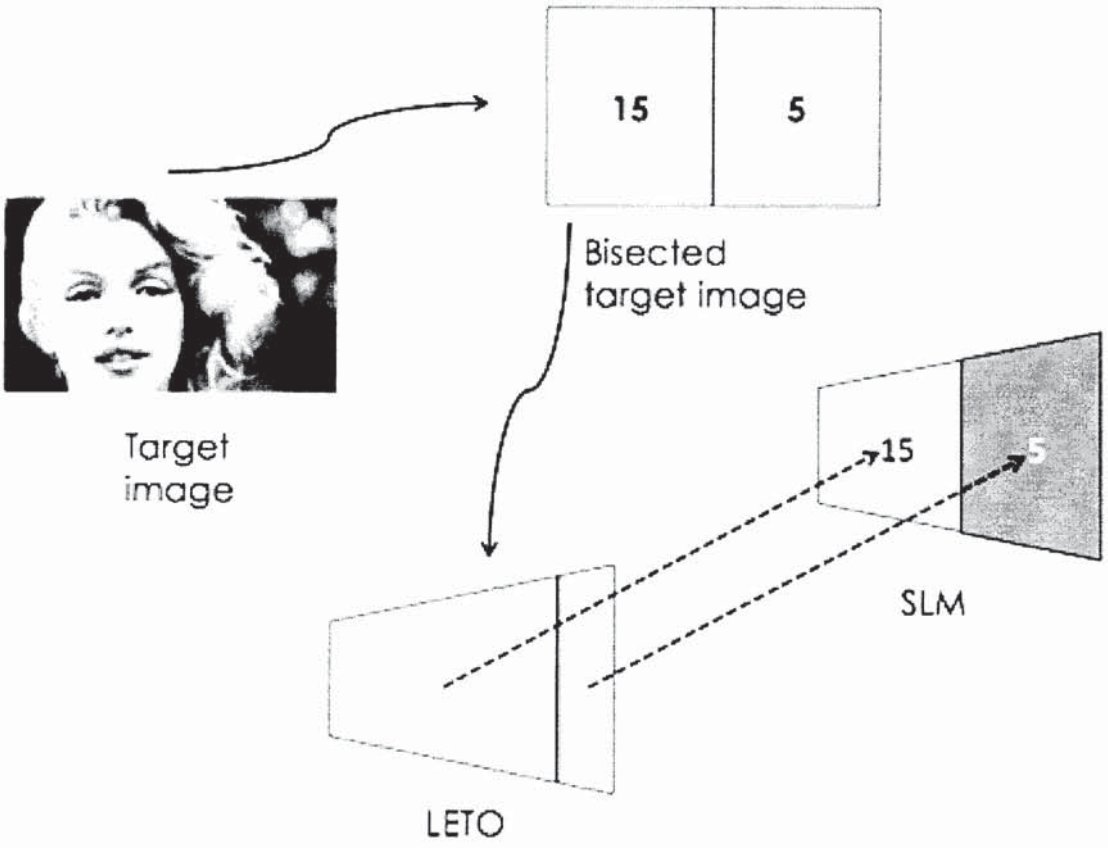

FIG. 4

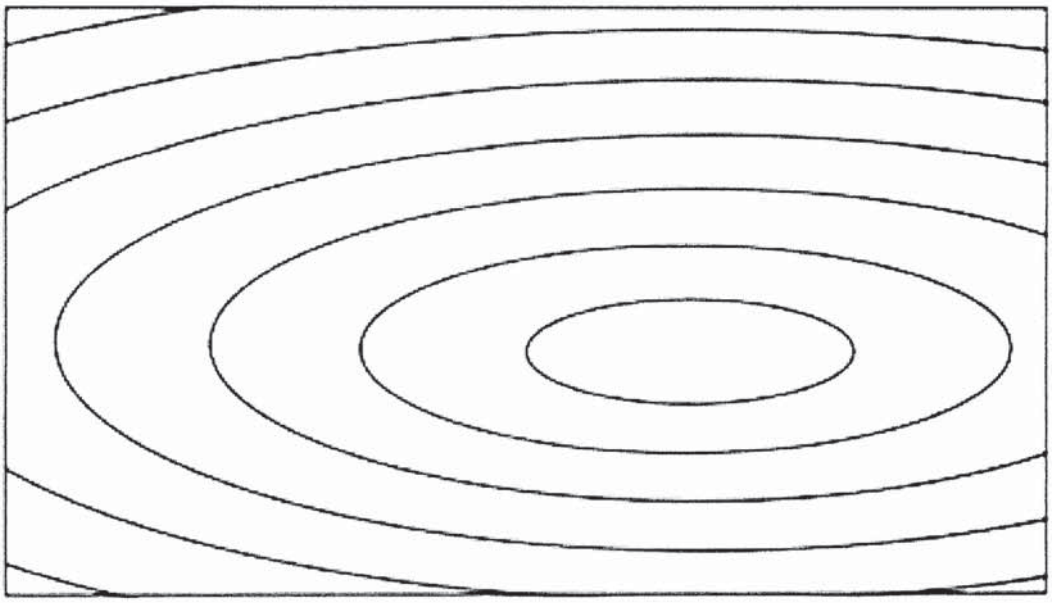

FIG. 5

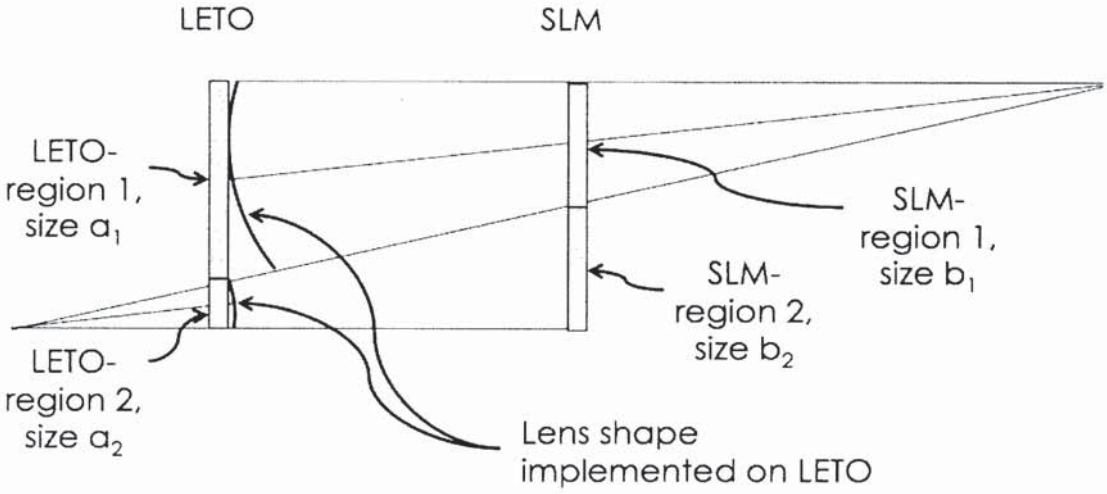
LETO
SLM
LETO-
region 1,
size a_1
LETO-
region 2,
size a_2
SLM-
region 1,
size b_1
SLM-
region 2,
size b_2
Lens shape
implemented on LETO

FIG. 6A

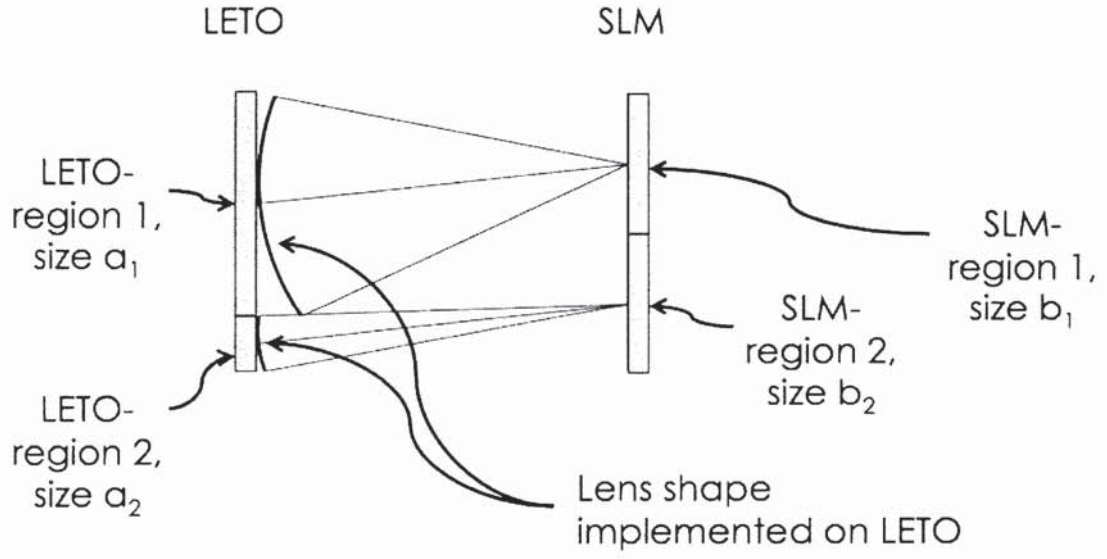
LETO
SLM
LETO-
region 1,
size a_1
LETO-
region 2,
size a_2
SLM-
region 1,
size b_1
SLM-
region 2,
size b_2
Lens shape
implemented on LETO

FIG. 6B

FIG. 7A

FIG. 7B

FIG. 7C

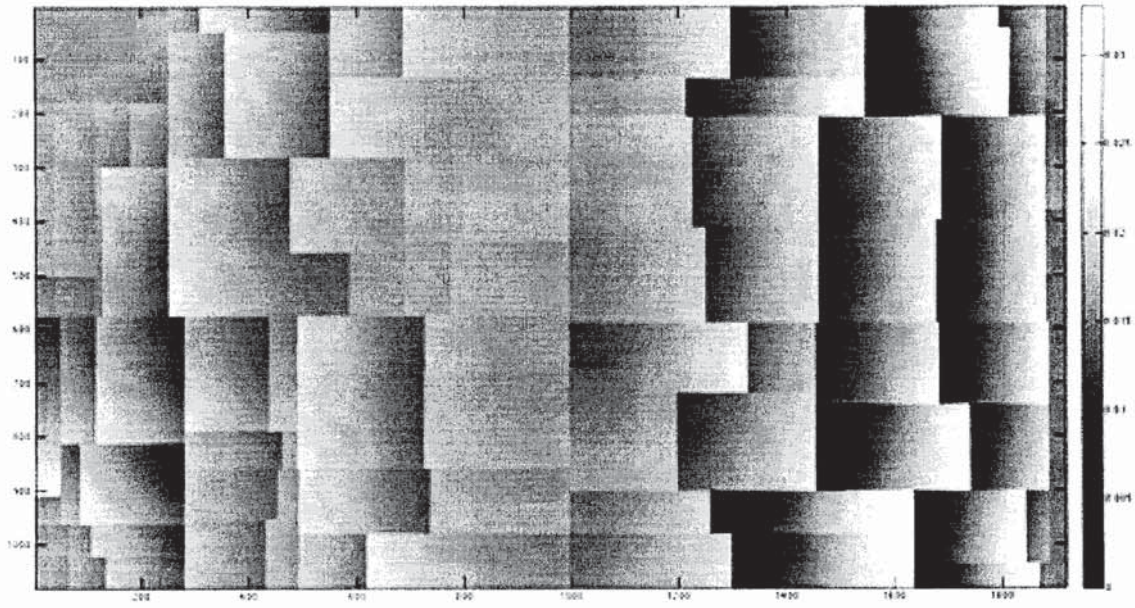

FIG. 8

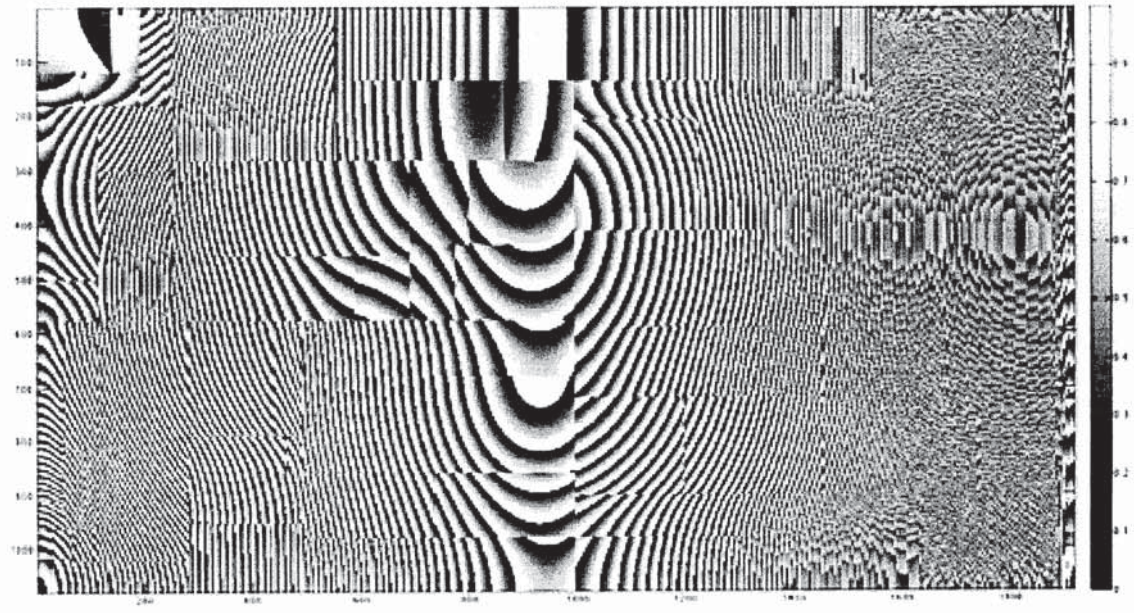

FIG. 9

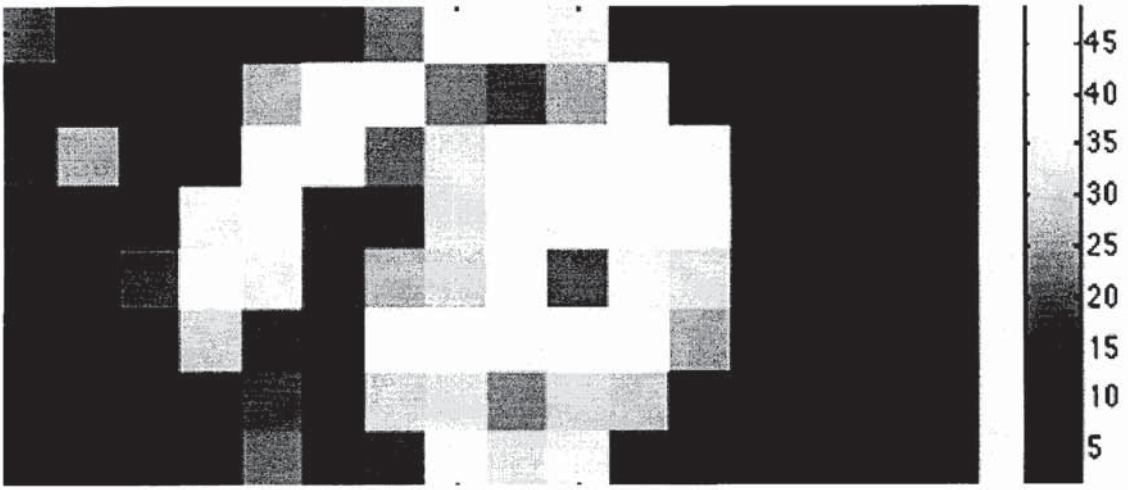
45
40
35
30
25
20
15
10
5

FIG. 10

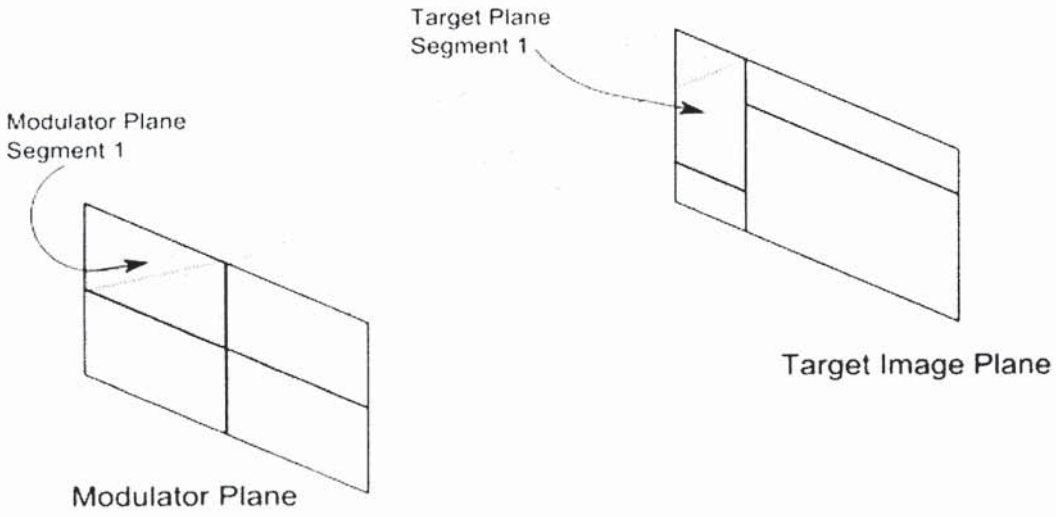
Target Plane
Segment 1
Modulator Plane
Segment 1
Target Image Plane
Modulator Plane

FIG. 11

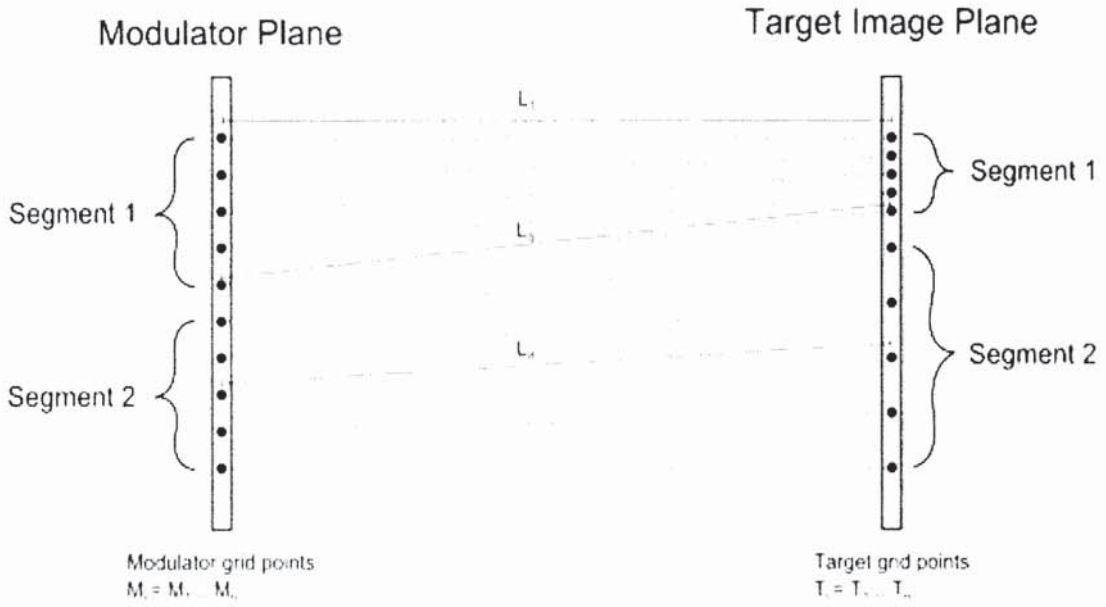
Modulator Plane
Target Image Plane
Segment 1
Segment 2
Segment 1
Segment 2
Modulator grid points
Target grid points

FIG. 12

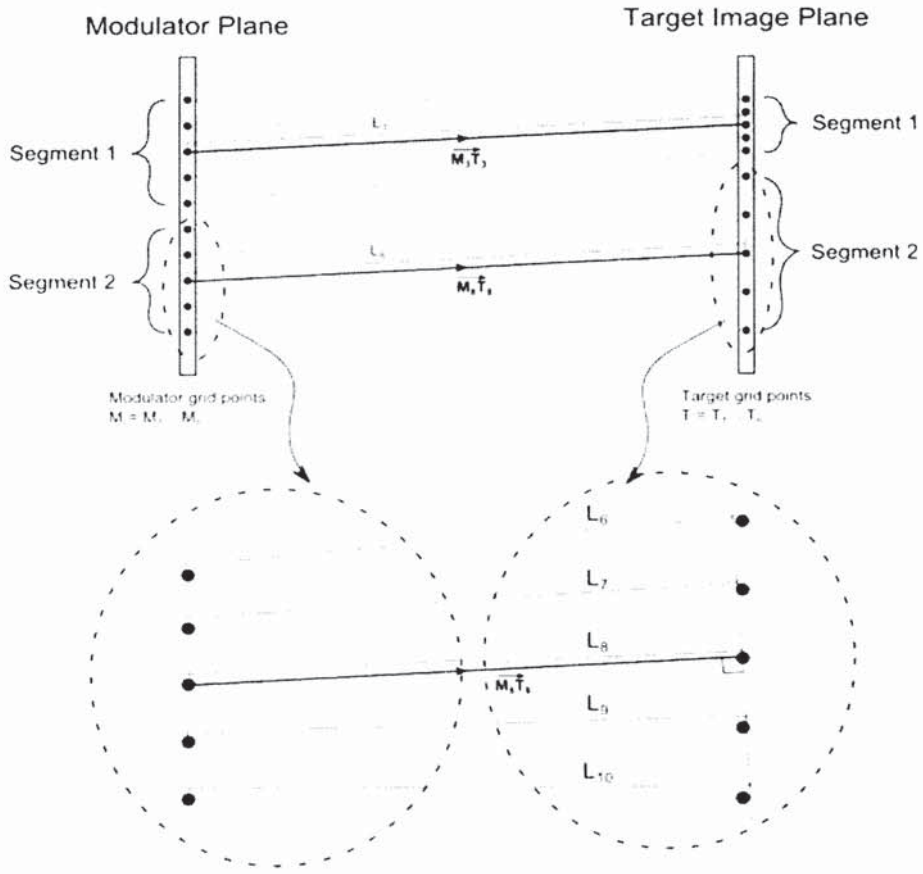
Modulator Plane
Target Image Plane
Segment 1
Segment 2
Segment 1
Segment 2
Modulator grid points
Target grid points

FIG. 13

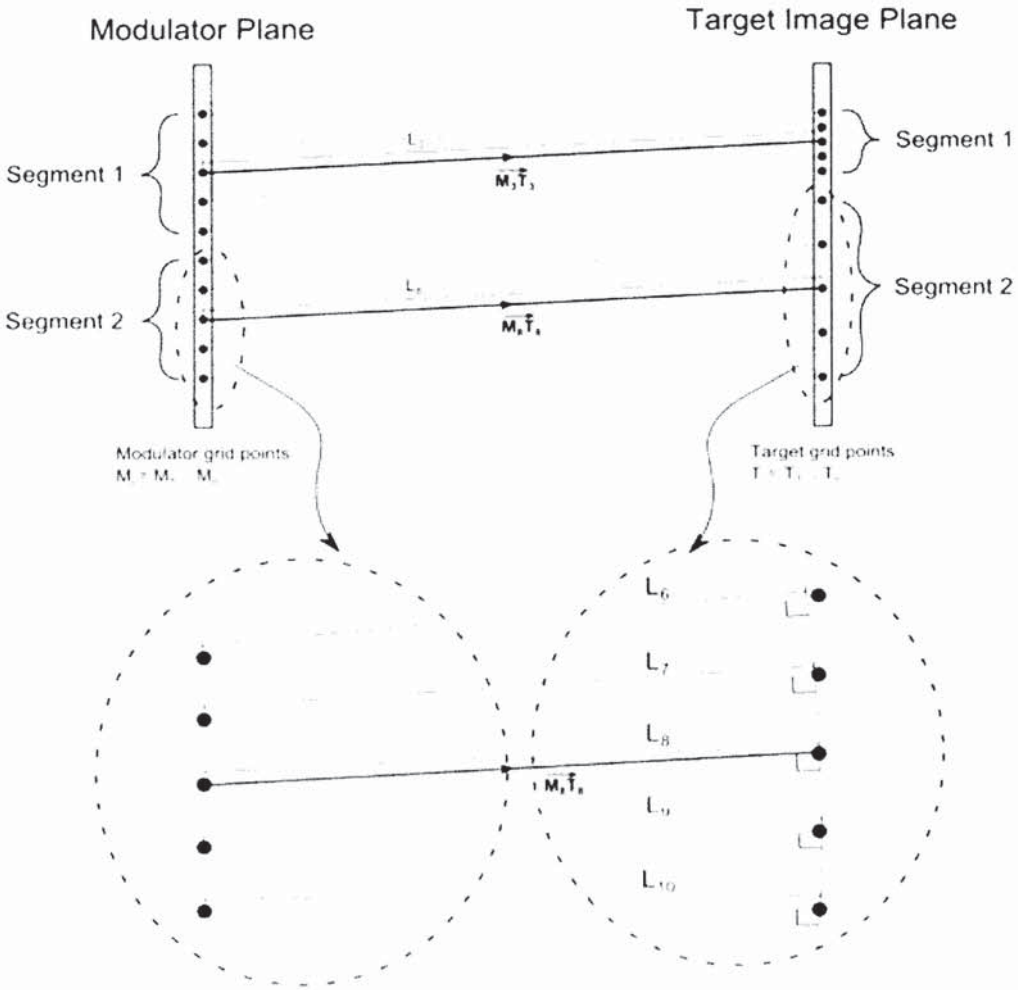
Modulator Plane
Target Image Plane
Segment 1
Segment 2
Segment 1
Segment 2
Modulator grid points
Target grid points

FIG. 14

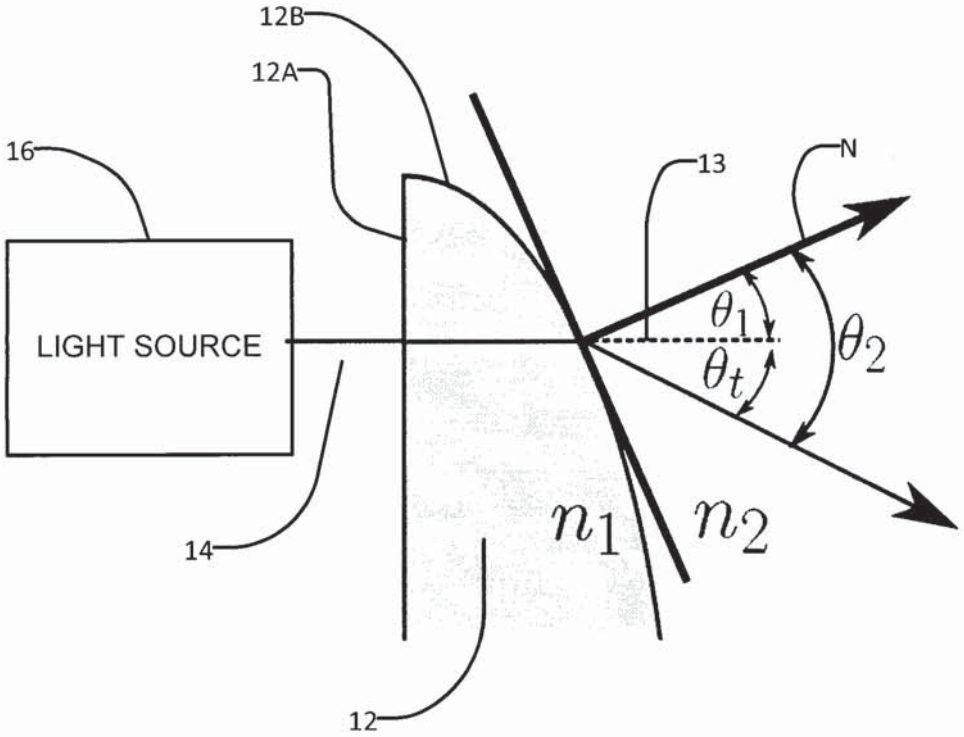

FIG. 15

FIG. 16A Without padding

FIG. 16B Padded target

FIG. 16C Mirrored padded

CA 02916836 2016-01-06

FIG. 17A target

FIG. 17B $\alpha = 2.0$

FIG. 17C $\alpha = 0.2$

FIG. 17D $\alpha = 0.02$

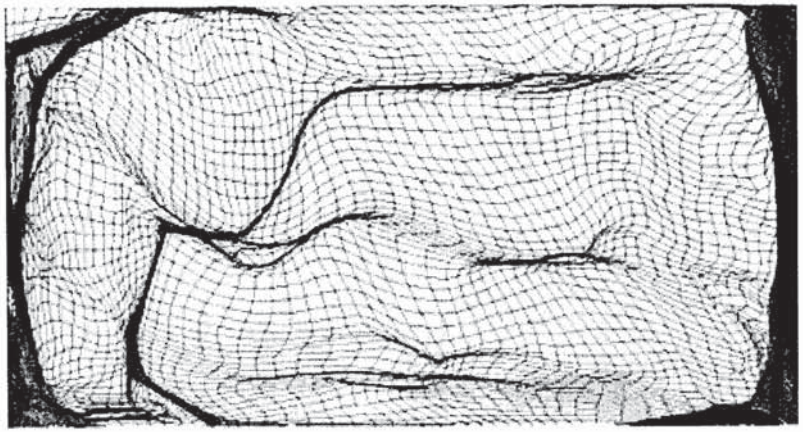

FIG. 18A unregularized point mappings

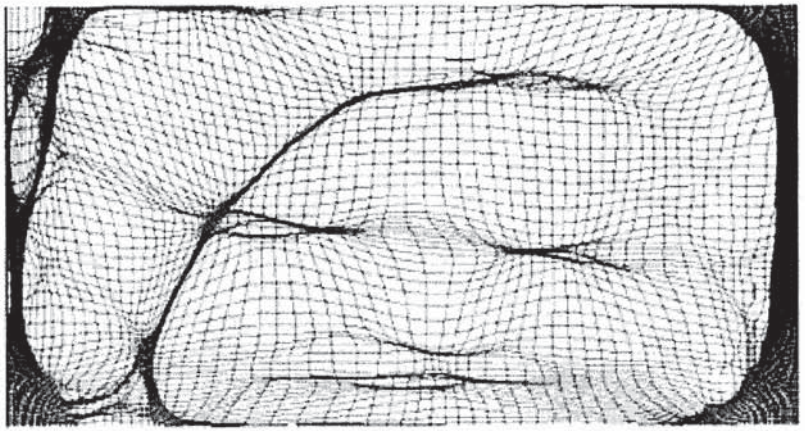

FIG. 18B regularized point mappings

FIG. 18C unregularized rendering

FIG. 18D regularized rendering

CA 02916836 2016-01-06

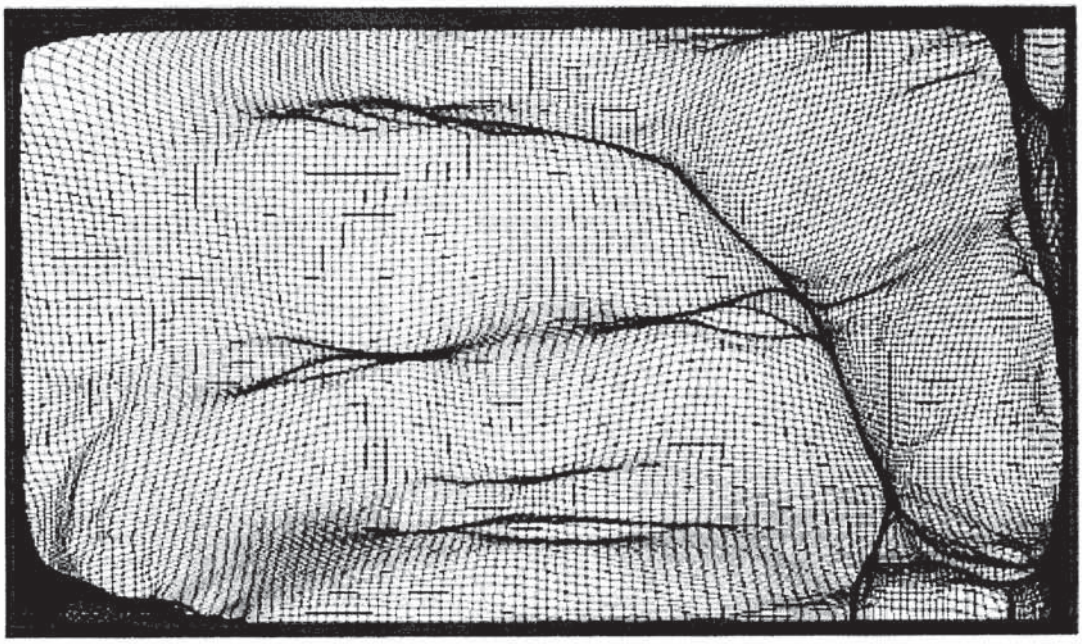

FIG. 19A Mapped point positions

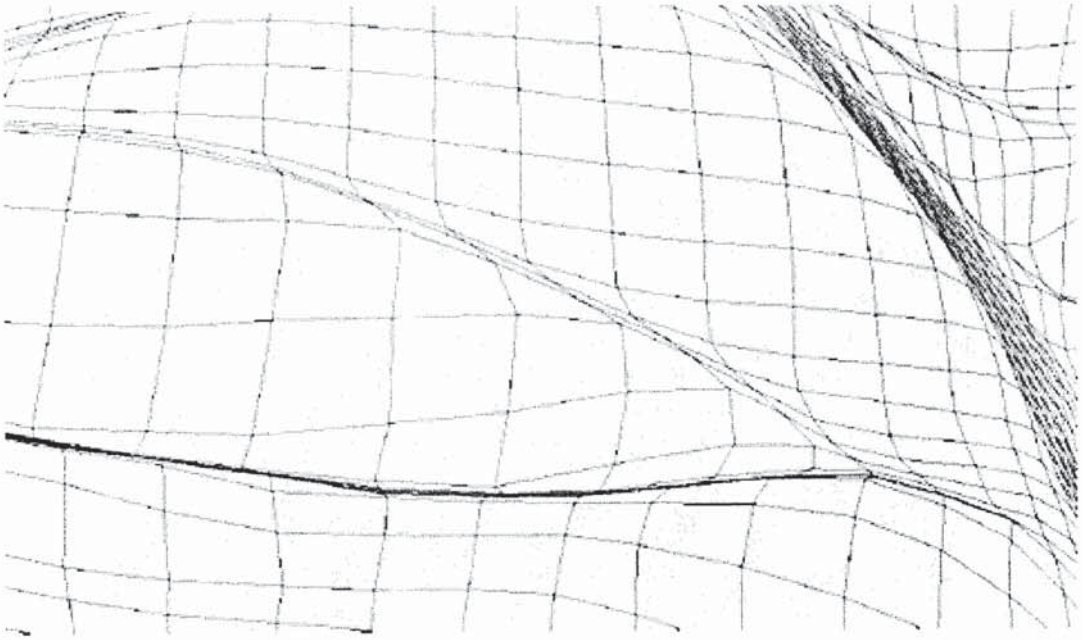

FIG. 19B Zoom into eye on right side of image

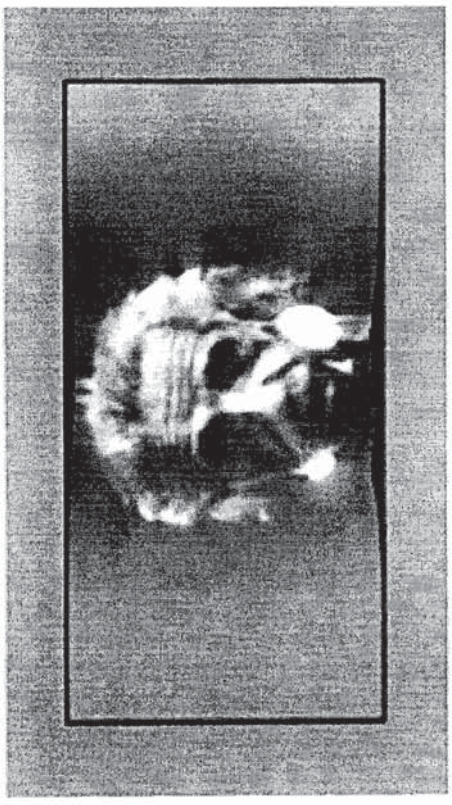

FIG. 20A Fourier

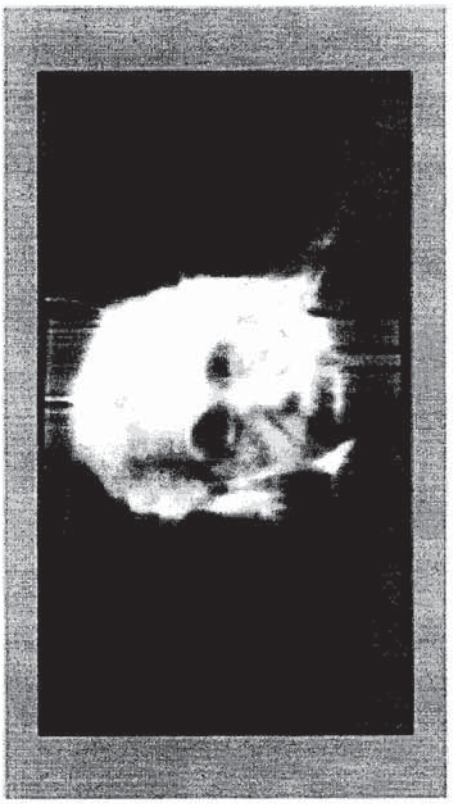

FIG. 20B Area-Parameterization

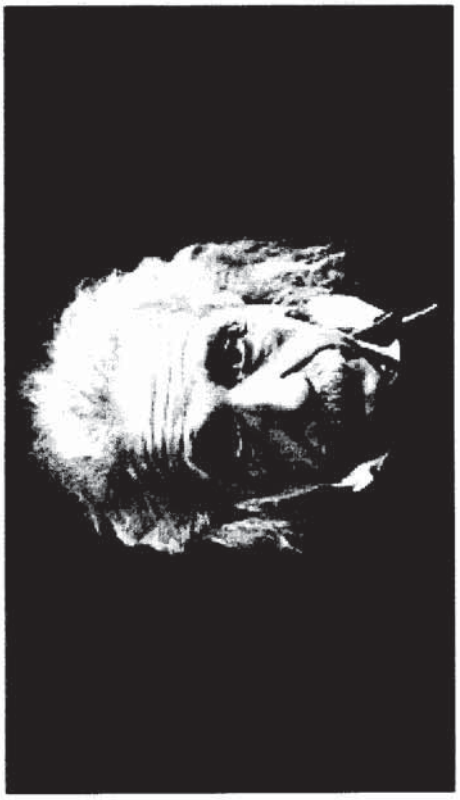

FIG. 20C target

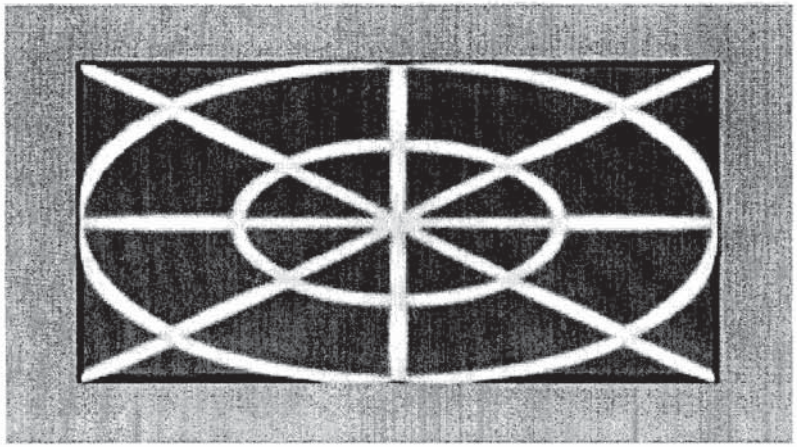

FIG. 21A Deblurring

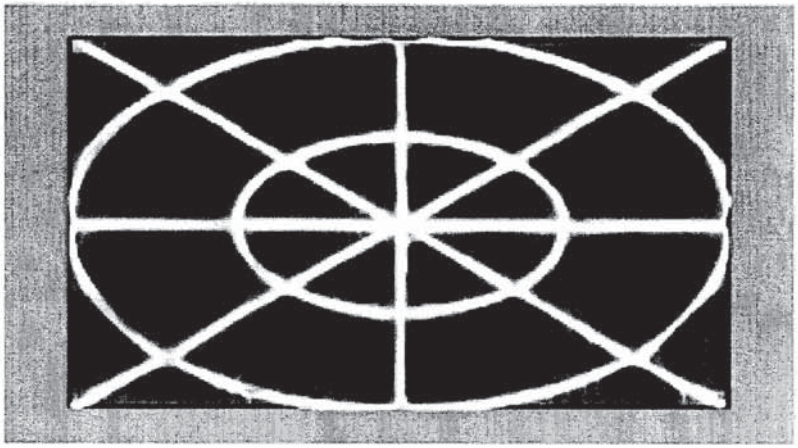

FIG. 21B Area-Parameterization

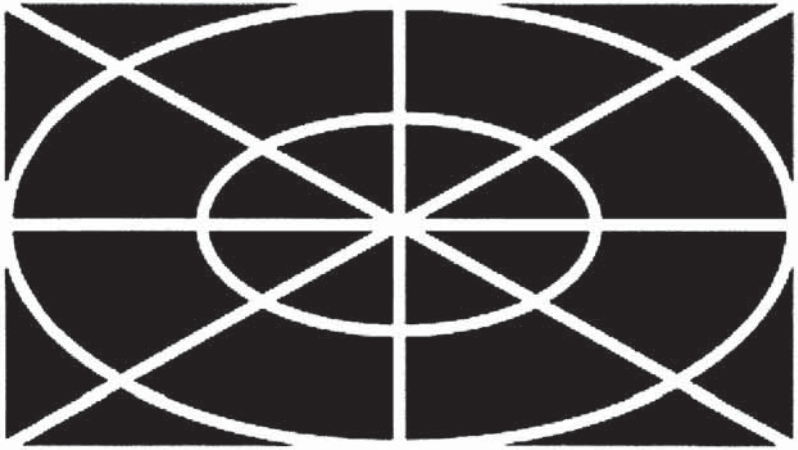

FIG. 21C target

CA 02916836 2016-01-06

FIG. 22A Deblurring

FIG. 22B Area-Parameterization

FIG. 22C target

CA 02916836 2016-01-06

FIG. 23B Area-Parameterization

FIG. 23A Deblurring

FIG. 23C target

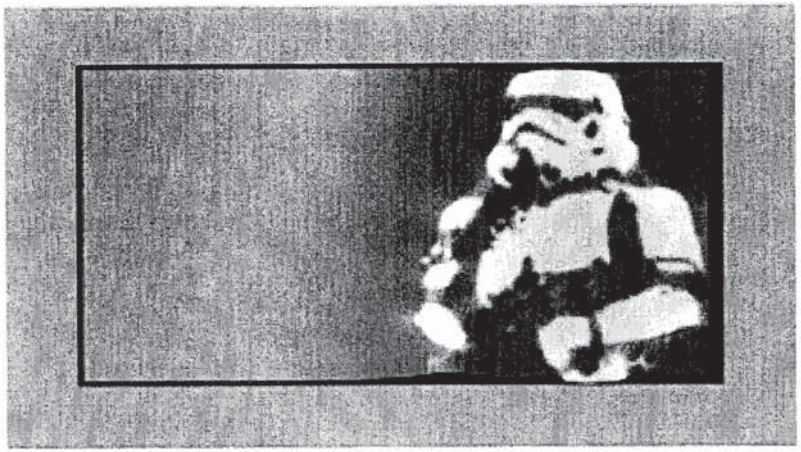

FIG. 24A Deblurring

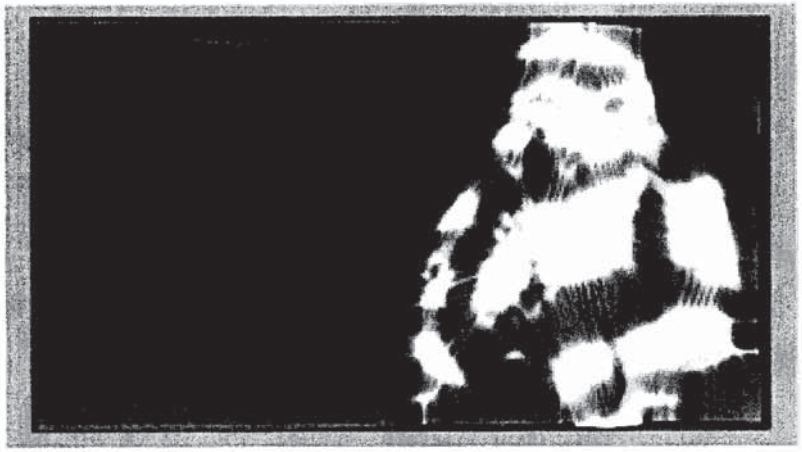

FIG. 24B Area-Parameterization

FIG. 24C target

CA 02916836 2016-01-06

FIG. 25A Scale 0.125

FIG. 25B Scale 0.25

FIG. 25C Scale 0.5

FIG. 25D Scale 1.0

FIG. 25E target

FIG. 26A $\beta = 0.1$

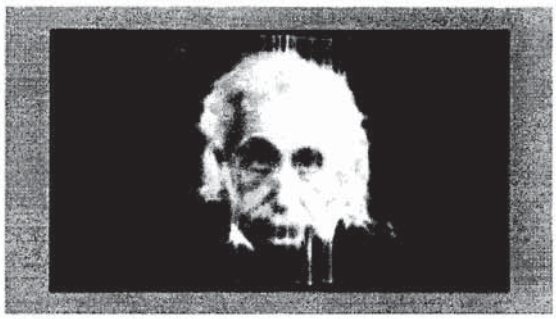

FIG. 26B $\beta = 1.0$

FIG. 26C $\beta = 10.0$

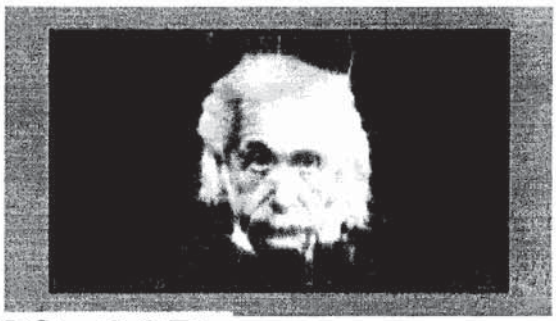

FIG. 26D $\beta = 100.0$

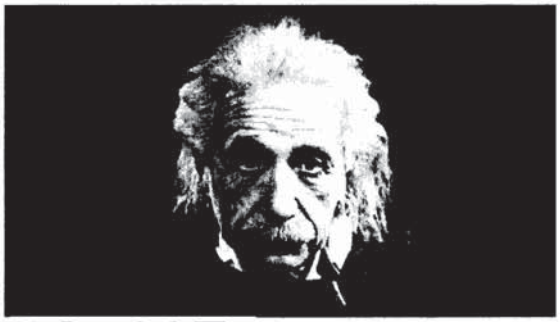

FIG. 26E target

FIG. 27A $\alpha = 0.001$

FIG. 27B $\alpha = 0.01$

FIG. 27C $\alpha = 0.1$

FIG. 27D $\alpha = 1.0$

FIG. 27E target

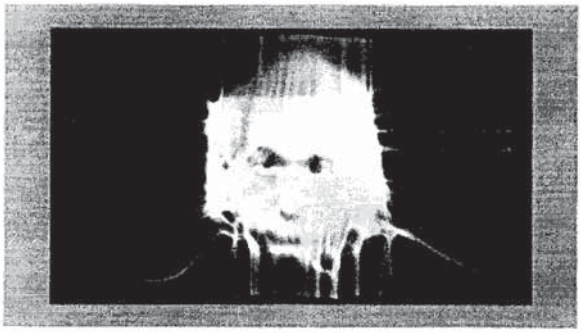

FIG. 28A $\epsilon = 0.001$

FIG. 28B $\epsilon = 0.01$

FIG. 28C $\epsilon = 0.1$

FIG. 28D $\epsilon = 1.0$

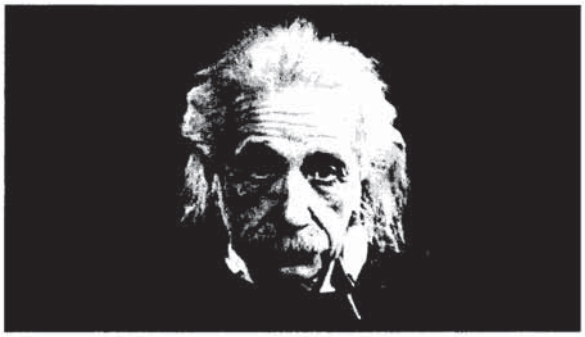

FIG. 28E target

FIG. 29A target

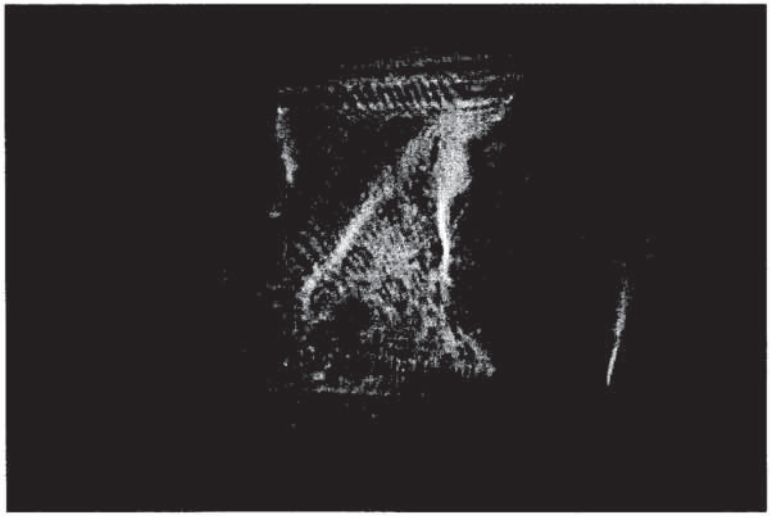

FIG. 29B b) Paraxial Deblurring

FIG. 29C Area-Parameterization

CA 02916836 2016-01-06

FIG. 30A target

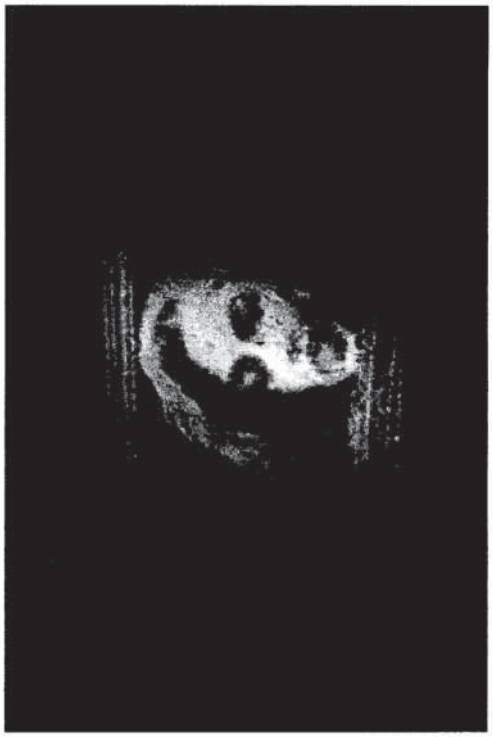

FIG. 30C Area-Parameterization

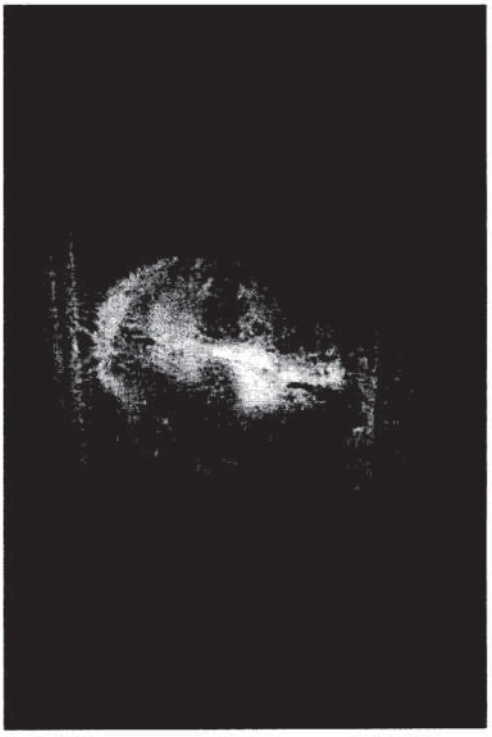

FIG. 30B Paraxial Deblurring

FIG. 31A target

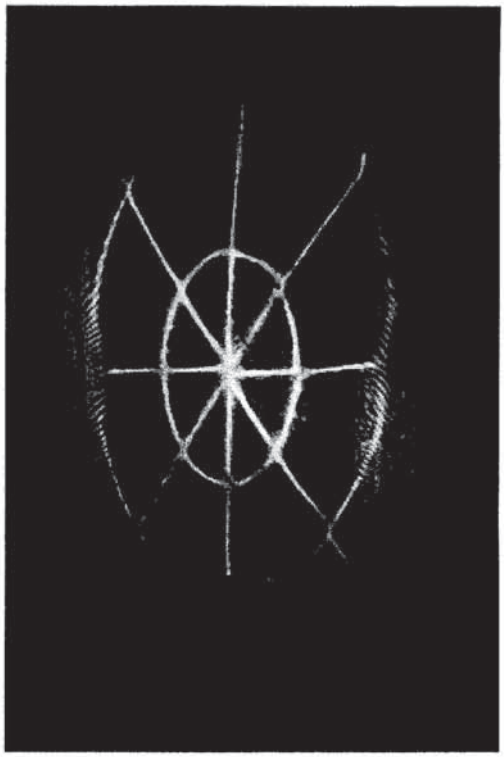

FIG. 31C Area-Parameterization

FIG. 31B Paraxial Deblurring

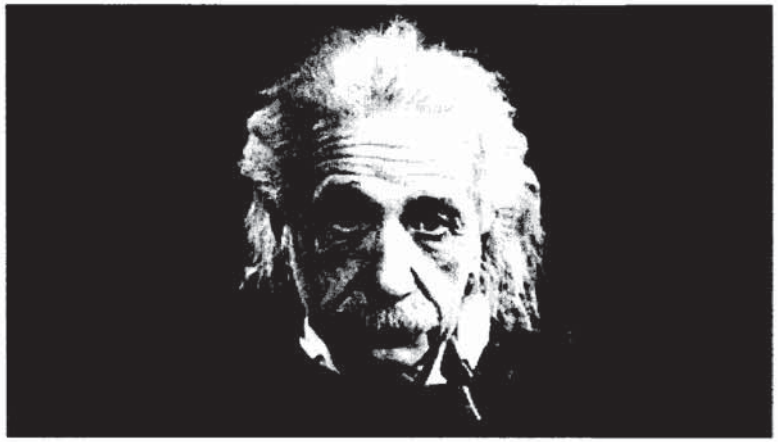

FIG. 32A target

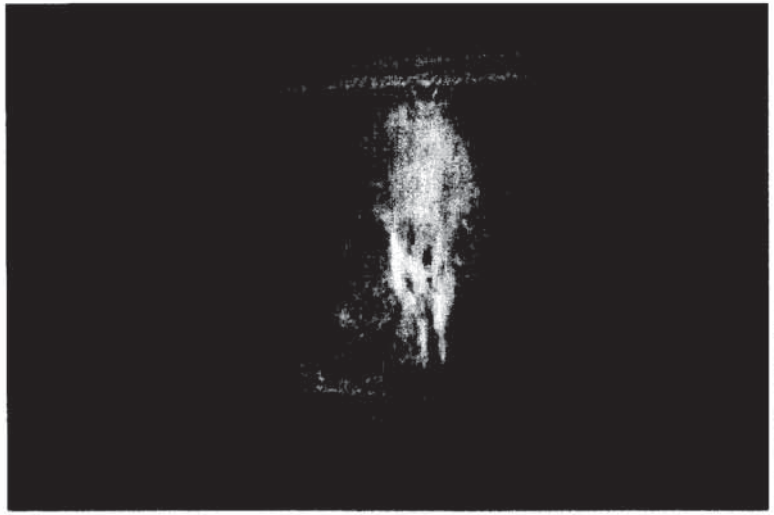

FIG. 32B Paraxial Deblurring

FIG. 32C Area-Parameterization

CA 02916836 2016-01-06

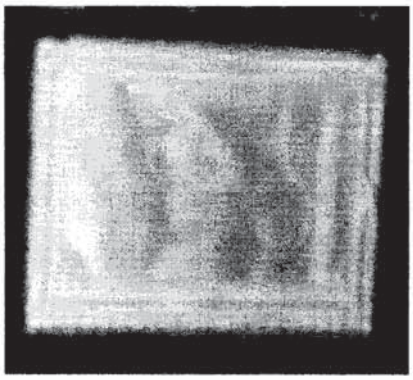

FIG. 33A lena area

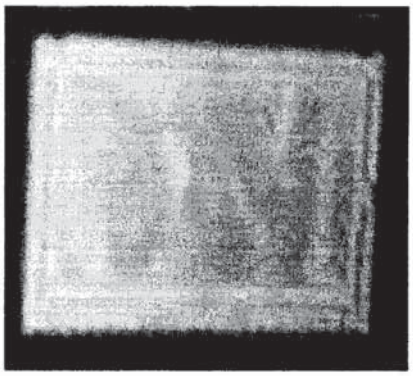

FIG. 33B lena paraxial

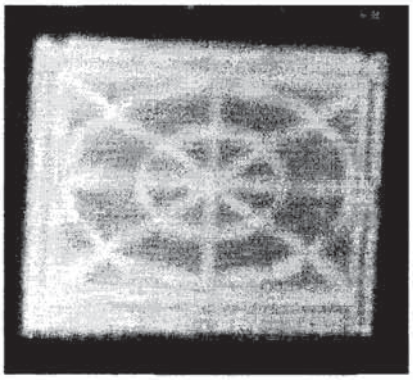

FIG. 33C fram-ref area

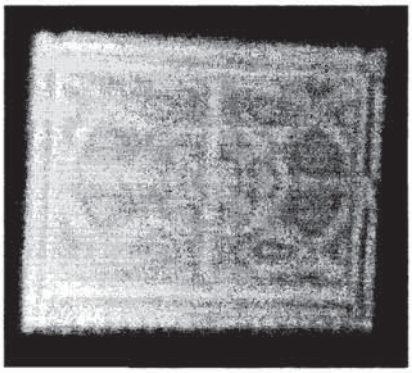

FIG. 33D fram-ref paraxial

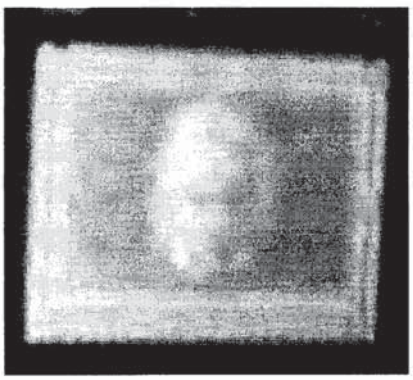

FIG. 33E einstein area

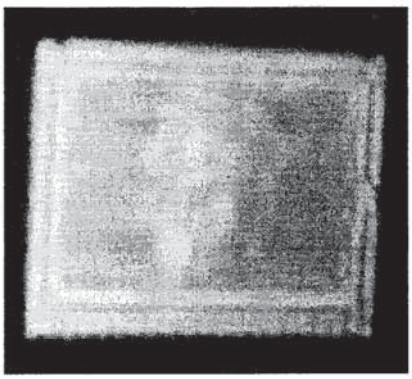

FIG. 33F einstein paraxial

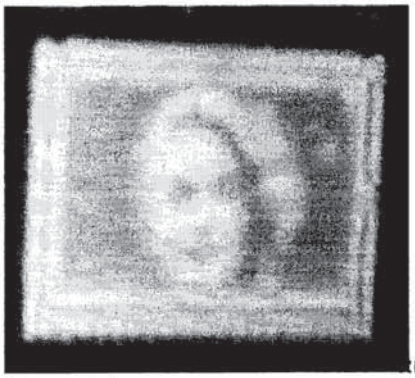

FIG. 33G marilyn area

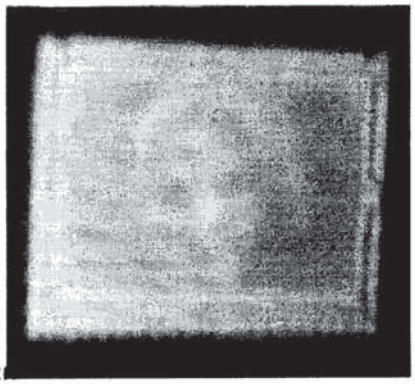

FIG. 33H marilyn paraxial

FIG. 34A lena

FIG. 34B fram-ref

FIG. 34C marilyn

FIG. 34D einstein

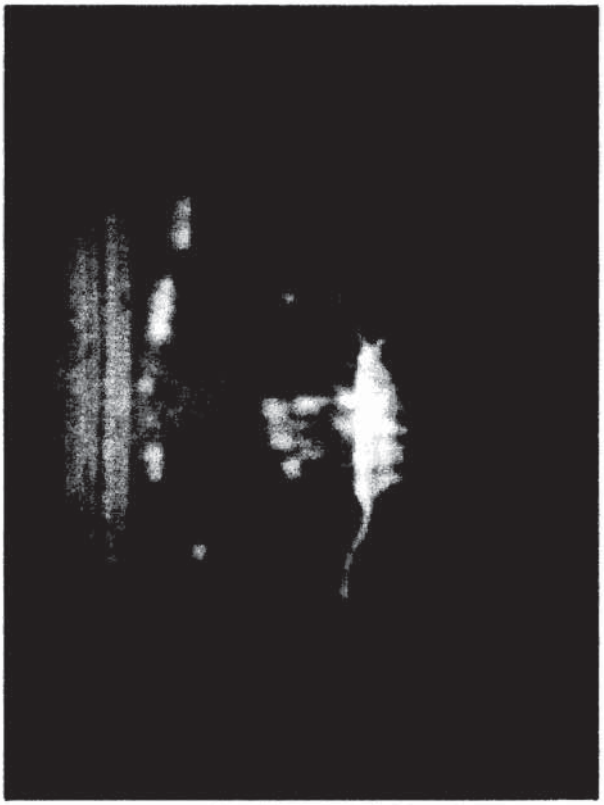

FIG. 35B Area-Parameterization

FIG. 35A target

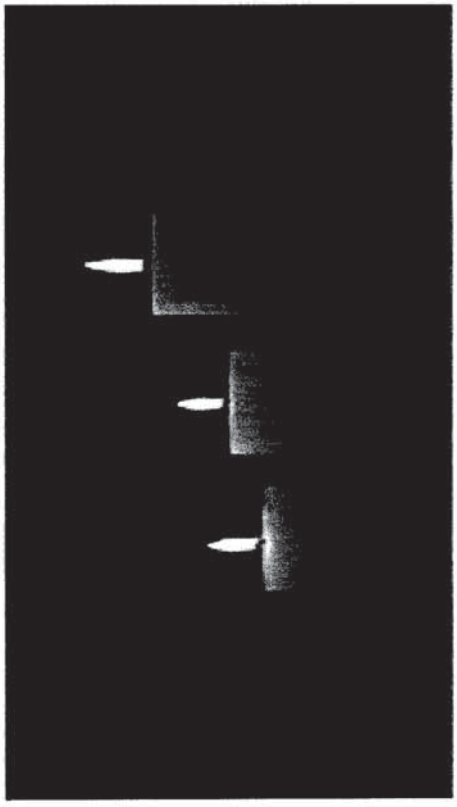

FIG. 36A target

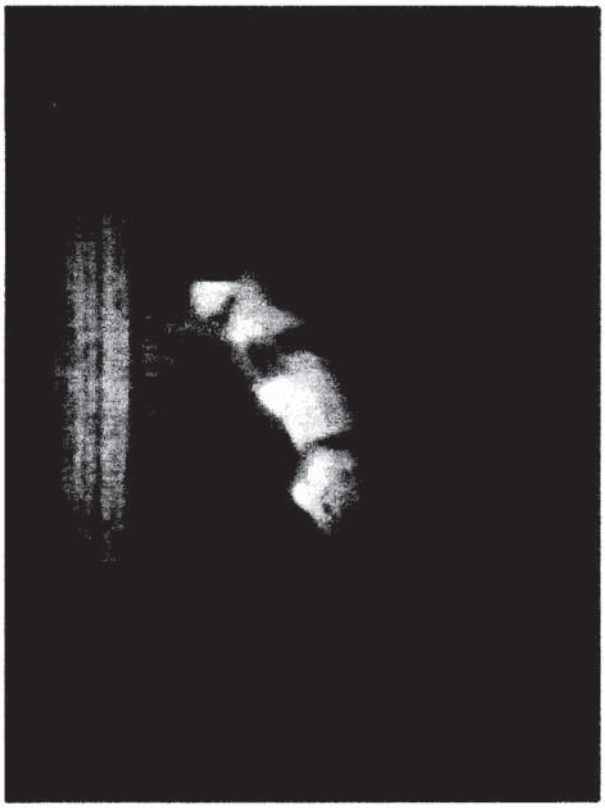

FIG. 36B Area-Parameterization

FIG. 37A target

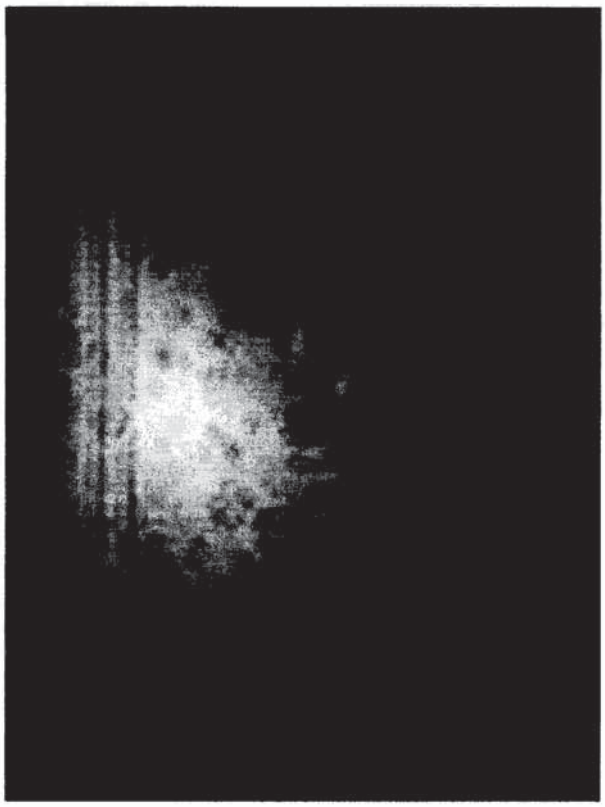

FIG. 37B Area-Parameterization

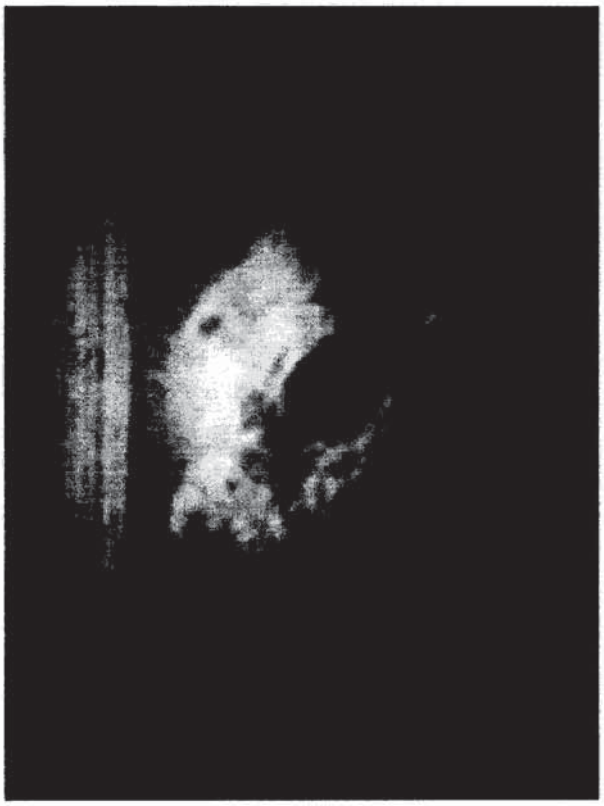

FIG. 38B Area-Parameterization

FIG. 38A target

FIG. 39B Area-Parameterization

FIG. 39A target

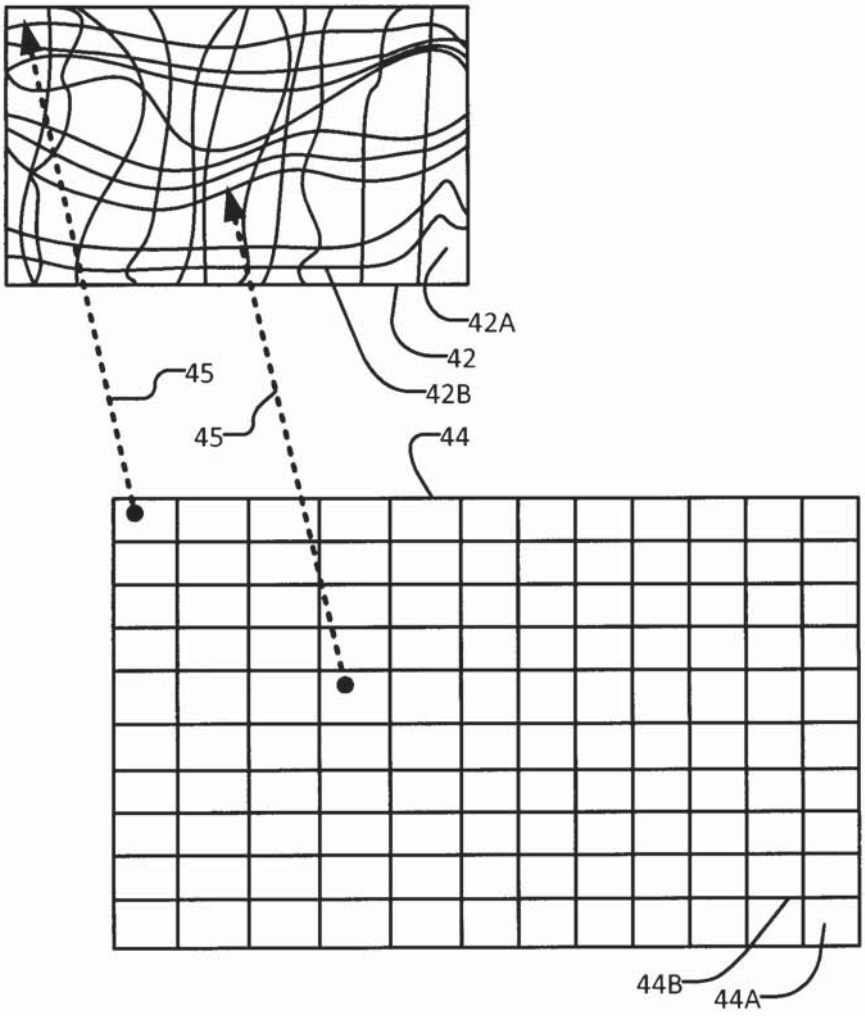

FIG. 40

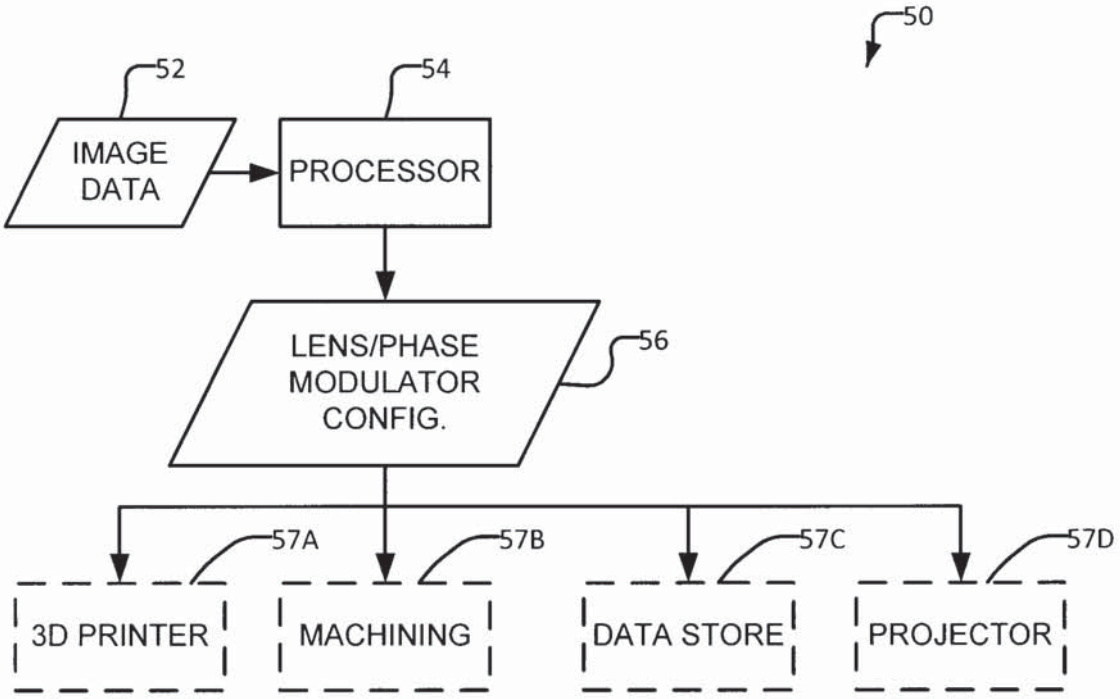
50
52
54
IMAGE DATA
PROCESSOR
LENS/PHASE MODULATOR CONFIG.
56
57A
57B
57C
57D
3D PRINTER
MACHINING
DATA STORE
PROJECTOR

FIG. 41

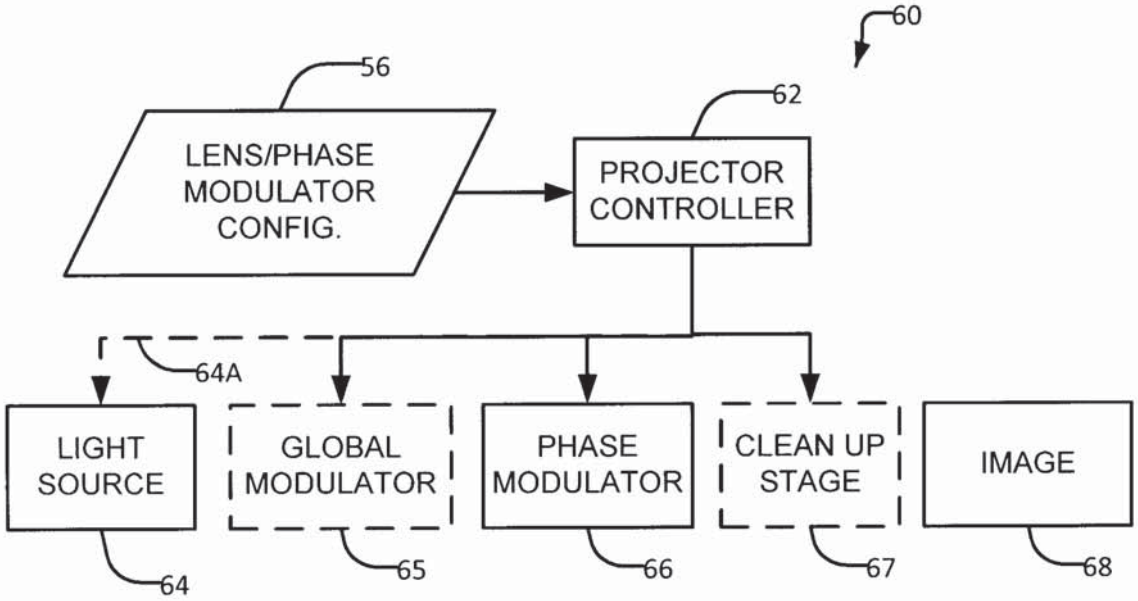
60
56
LENS/PHASE MODULATOR CONFIG.
62
PROJECTOR CONTROLLER
64A
LIGHT SOURCE
GLOBAL MODULATOR
PHASE MODULATOR
CLEAN UP STAGE
IMAGE
64
65
66
67
68

FIG. 42

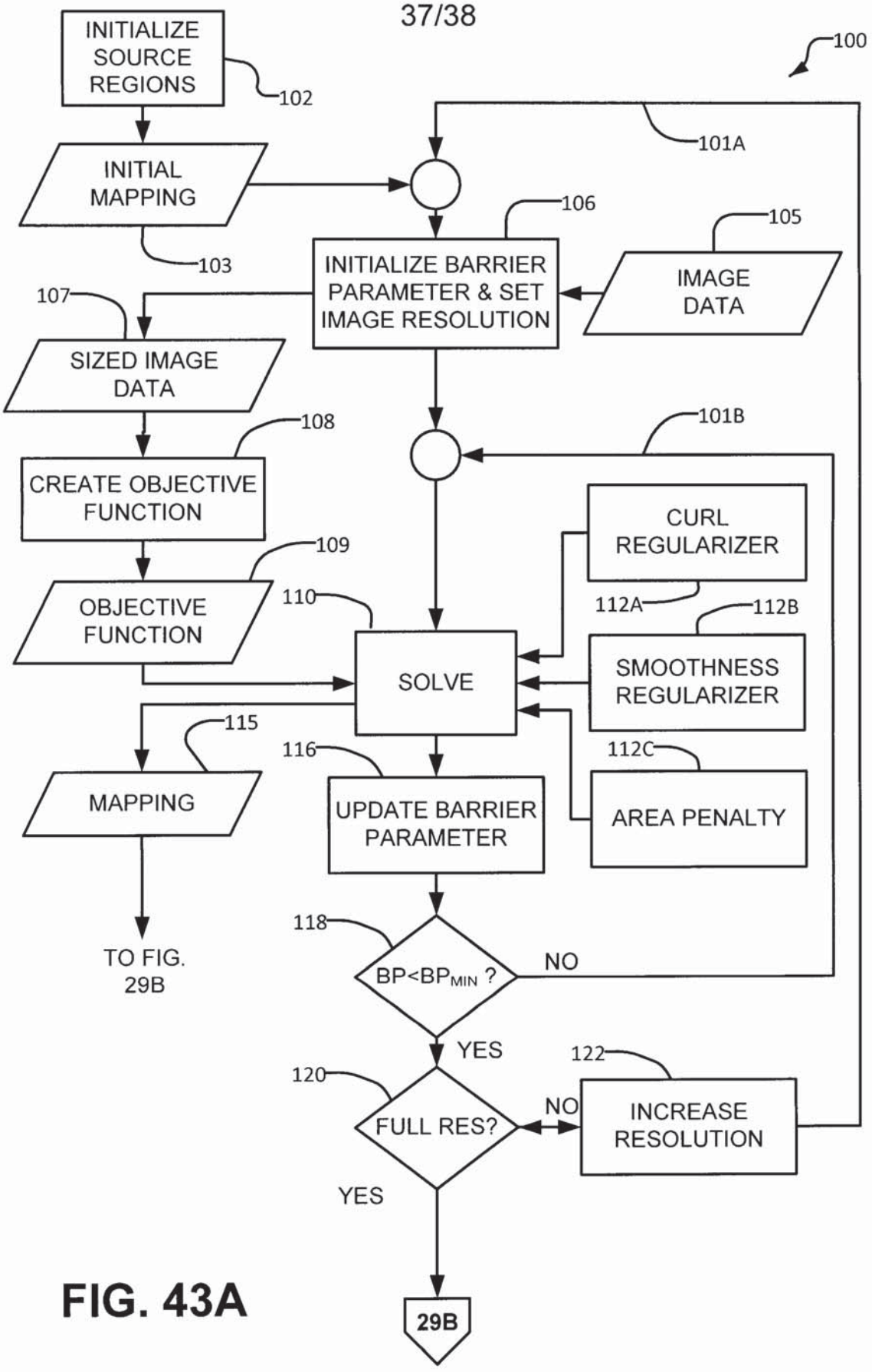
INITIALIZE SOURCE REGIONS
102
100
101A
INITIAL MAPPING
103
106
105
INITIALIZE BARRIER PARAMETER & SET IMAGE RESOLUTION
IMAGE DATA
107
SIZED IMAGE DATA
108
101B
CREATE OBJECTIVE FUNCTION
CURL REGULARIZER
109
OBJECTIVE FUNCTION
110
112A
112B
SOLVE
SMOOTHNESS REGULARIZER
115
116
112C
MAPPING
UPDATE BARRIER PARAMETER
AREA PENALTY
118
TO FIG. 29B
BP<BP_MIN ?
NO
YES
122
120
FULL RES?
NO
INCREASE RESOLUTION
YES
29B

FIG. 43A

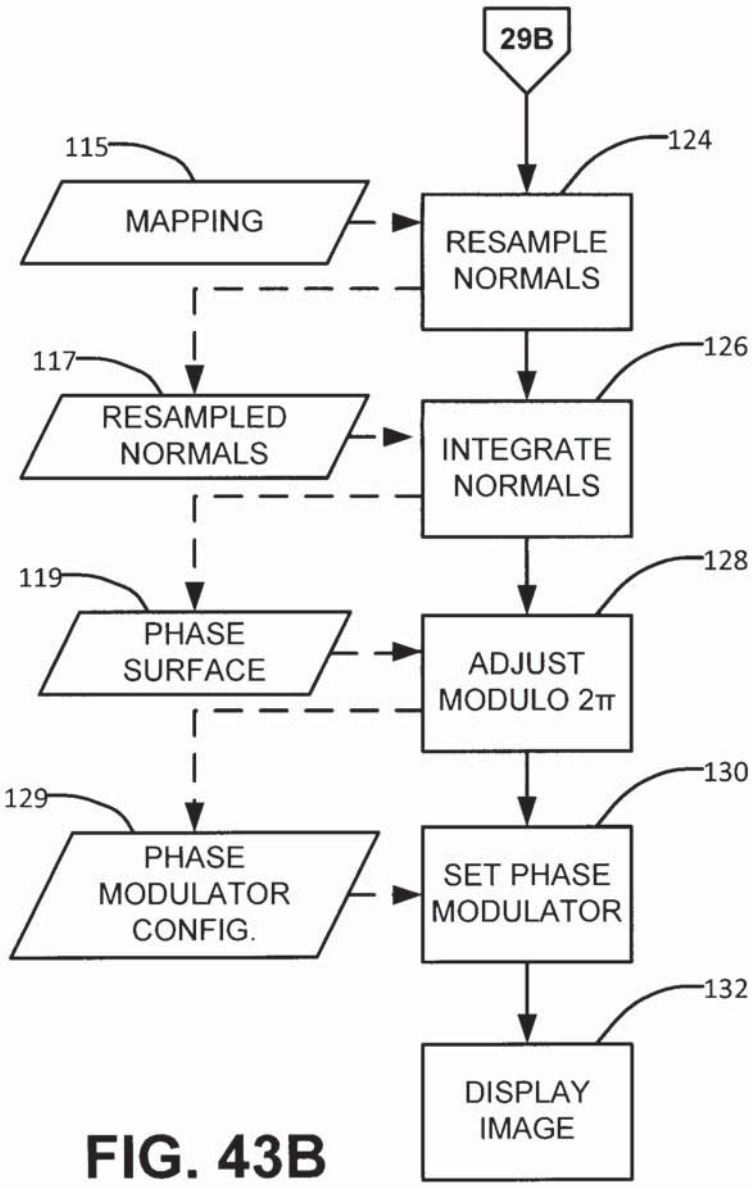
29B
115
MAPPING
124
RESAMPLE NORMALS
117
RESAMPLED NORMALS
126
INTEGRATE NORMALS
119
PHASE SURFACE
128
ADJUST MODULO 2π
129
PHASE MODULATOR CONFIG.
130
SET PHASE MODULATOR
132
DISPLAY IMAGE

FIG. 43B