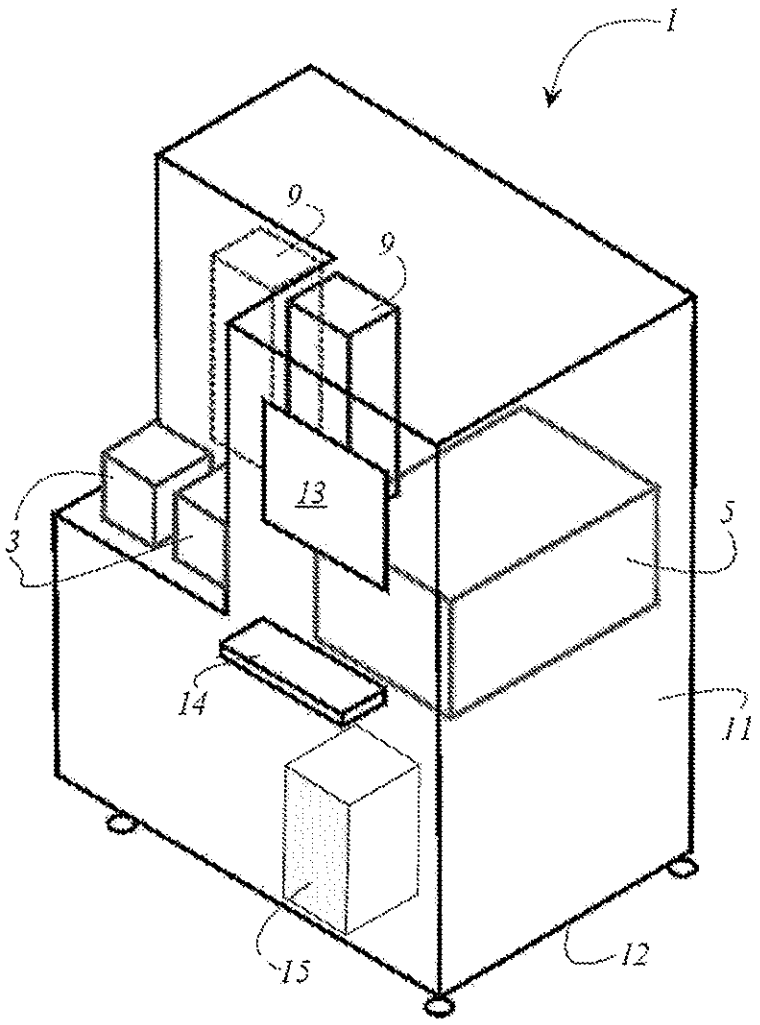


Fig. 1

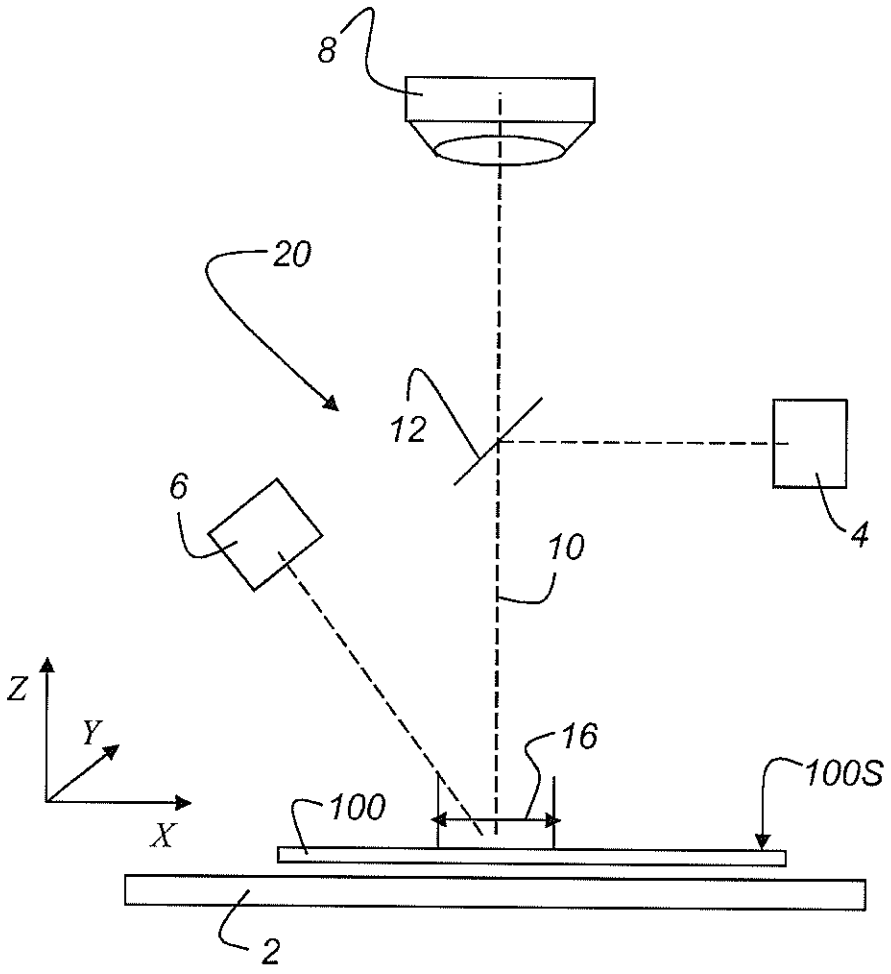


Fig. 2

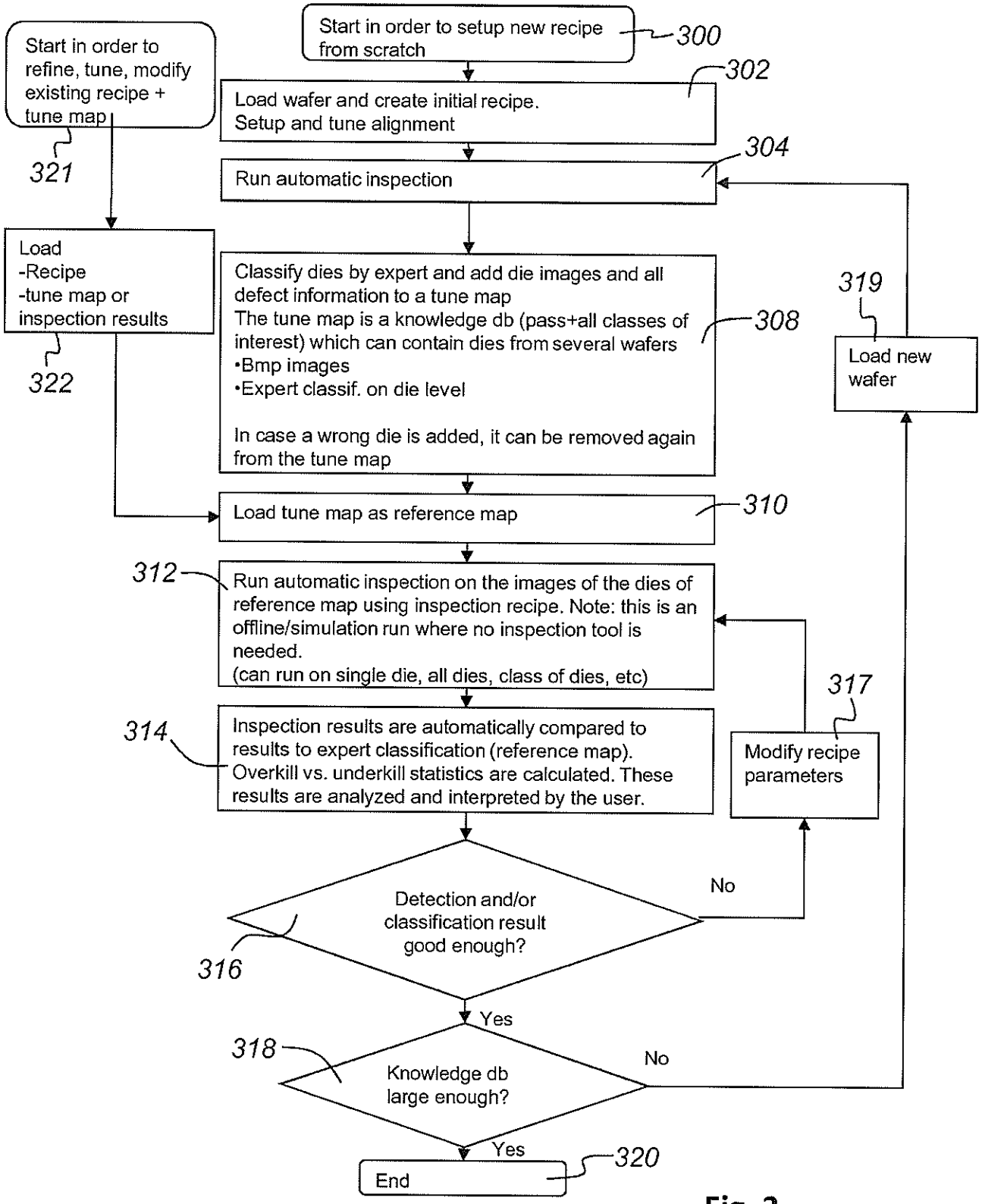

Start in order to setup new recipe from scratch
300
Start in order to refine, tune, modify existing recipe + tune map
321
Load wafer and create initial recipe. Setup and tune alignment
302
Run automatic inspection
304
Load
-Recipe
-tune map or inspection results
322
Classify dies by expert and add die images and all defect information to a tune map
The tune map is a knowledge db (pass+all classes of interest) which can contain dies from several wafers
•Bmp images
•Expert classif. on die level
In case a wrong die is added, it can be removed again from the tune map
308
319
Load new wafer
Load tune map as reference map
310
312
Run automatic inspection on the images of the dies of reference map using inspection recipe. Note: this is an offline/simulation run where no inspection tool is needed.
(can run on single die, all dies, class of dies, etc)
317
Modify recipe parameters
314
Inspection results are automatically compared to results to expert classification (reference map). Overkill vs. underkill statistics are calculated. These results are analyzed and interpreted by the user.
Detection and/or classification result good enough?
316
No
Yes
318
Knowledge db large enough?
No
Yes
End
320

Fig. 3

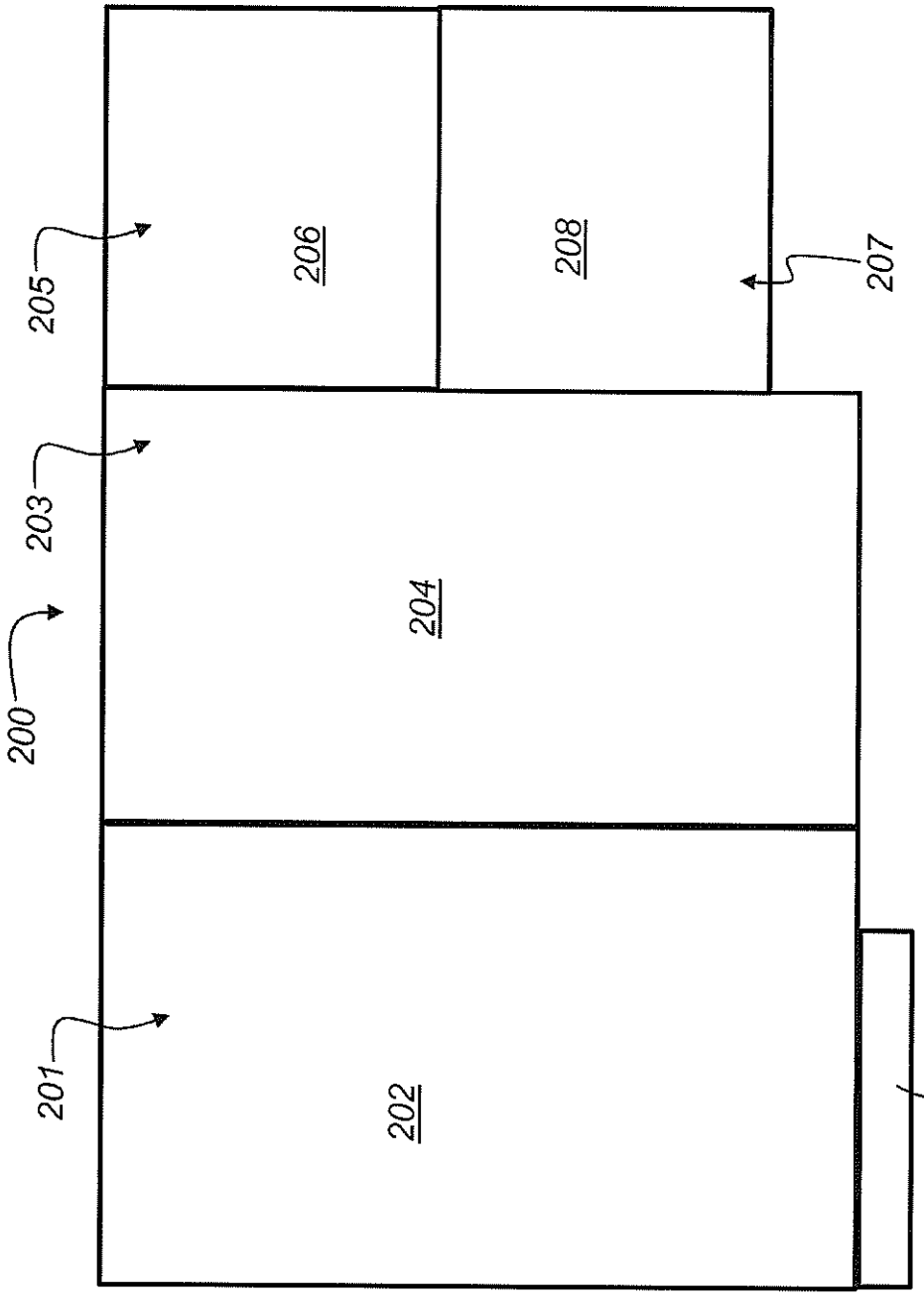


Fig. 4

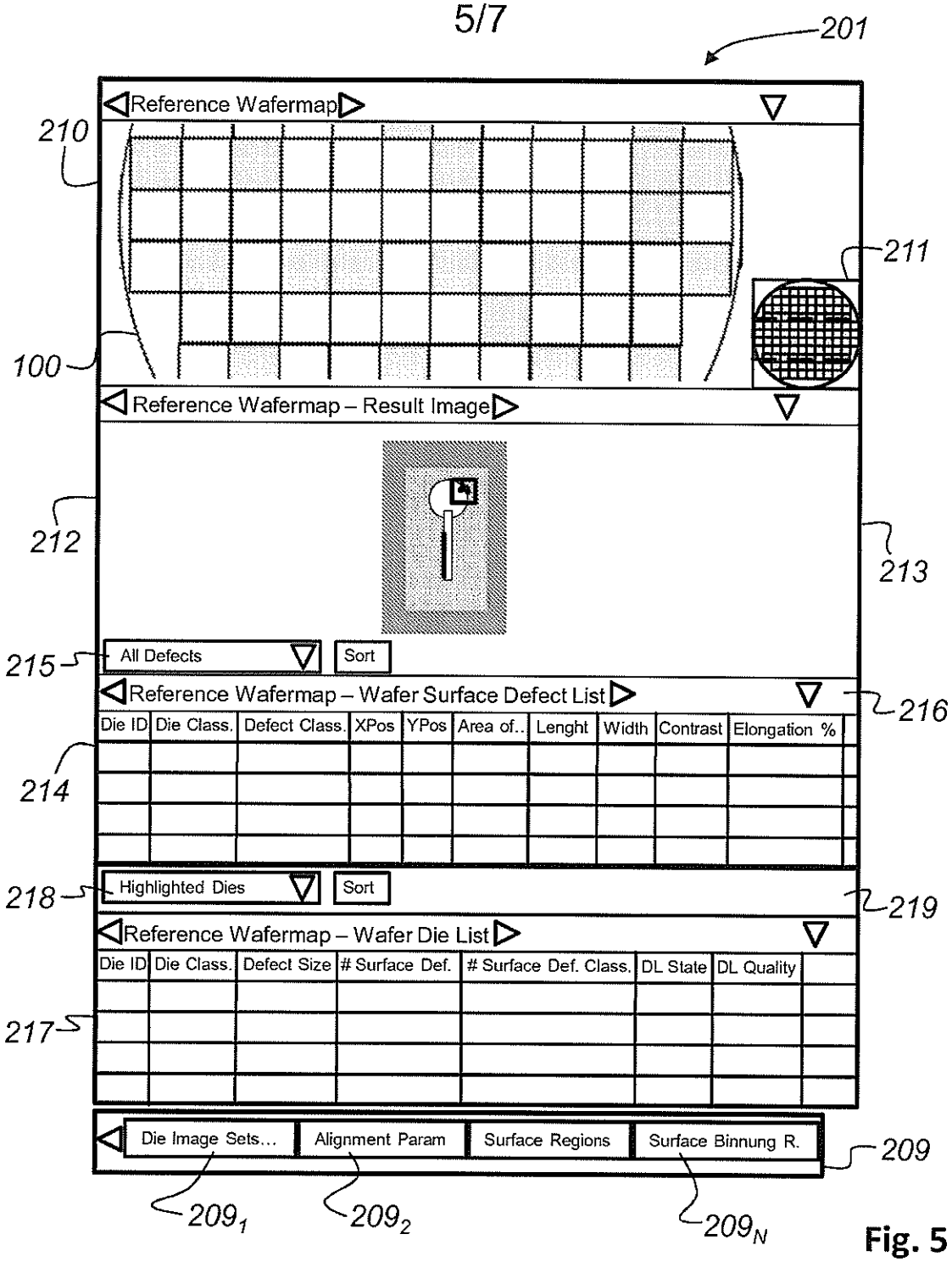

201
Reference Wafermap
210
211
100
Reference Wafermap – Result Image
212
213
215
All Defects
Sort
Reference Wafermap – Wafer Surface Defect List
216
Die ID
Die Class.
Defect Class.
XPos
YPos
Area of..
Lenght
Width
Contrast
Elongation %
214
218
Highlighted Dies
Sort
219
Reference Wafermap – Wafer Die List
Die ID
Die Class.
Defect Size
Surface Def.
Surface Def. Class.
DL State
DL Quality
217
Die Image Sets...
Alignment Param
Surface Regions
Surface Binnung R.
209
209$_1$
209$_2$
209$_N$

Fig. 5

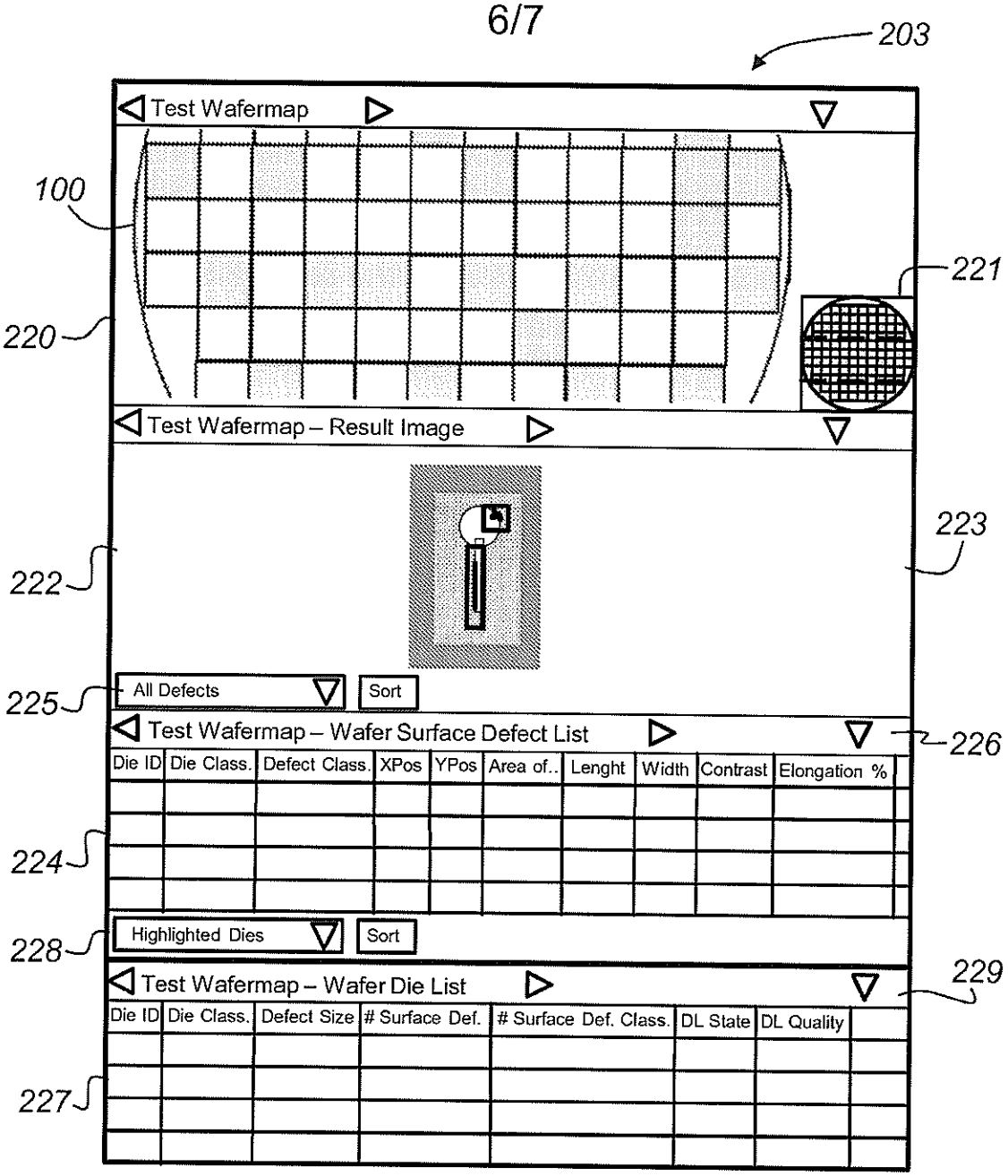

203
Test Wafermap
100
220
221
Test Wafermap – Result Image
222
223
225
All Defects
Sort
Test Wafermap – Wafer Surface Defect List
226
Die ID
Die Class.
Defect Class.
XPos
YPos
Area of..
Lenght
Width
Contrast
Elongation %
224
228
Highlighted Dies
Sort
Test Wafermap – Wafer Die List
229
Die ID
Die Class.
Defect Size
Surface Def.
Surface Def. Class.
DL State
DL Quality
227

Fig. 6

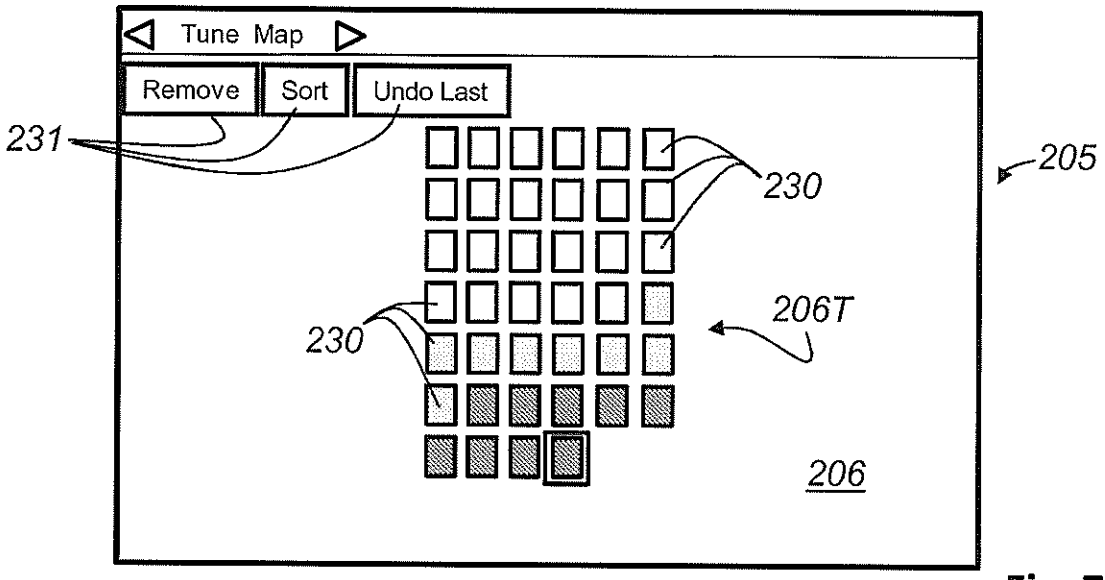

Tune Map
Remove
Sort
Undo Last
231
230
205
230
206T
206

Fig. 7

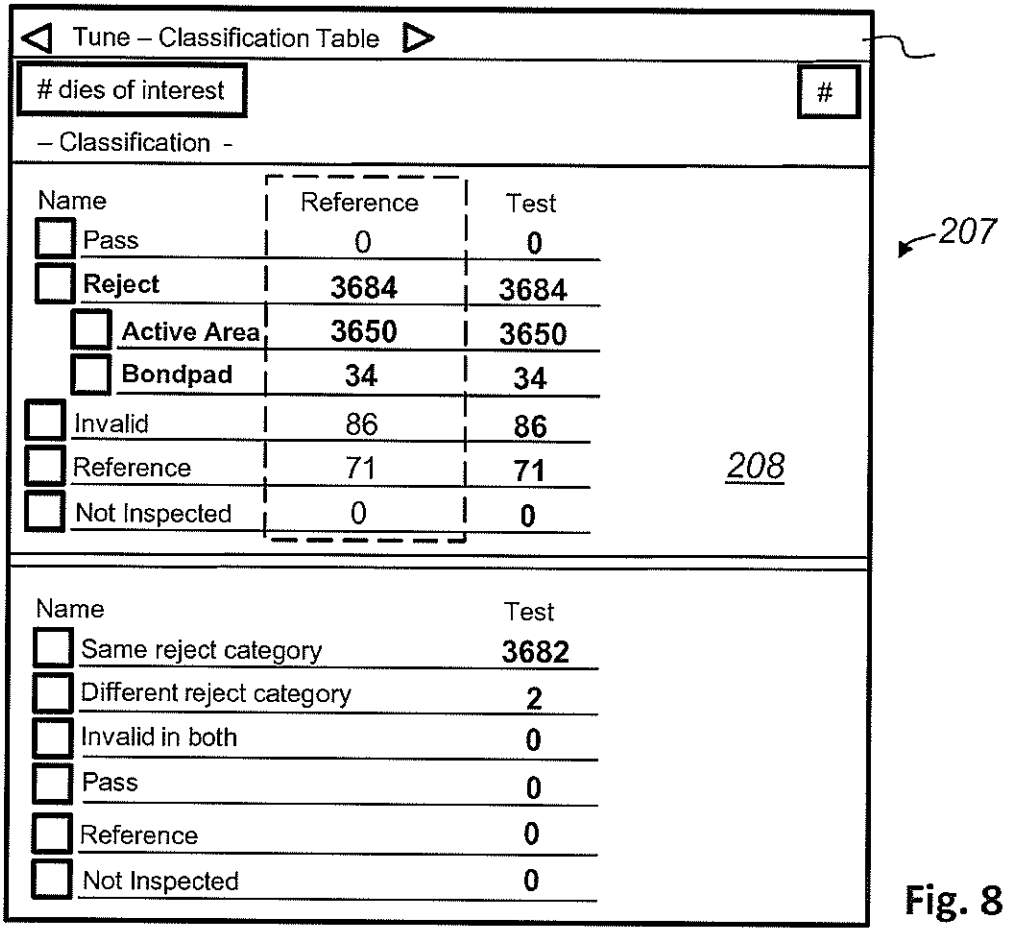

Tune – Classification Table
dies of interest
#
– Classification -
Name
Reference
Test
Pass 0 0
Reject 3684 3684
Active Area 3650 3650
Bondpad 34 34
Invalid 86 86
Reference 71 71
Not Inspected 0 0
207
208
Name
Test
Same reject category 3682
Different reject category 2
Invalid in both 0
Pass 0
Reference 0
Not Inspected 0

Fig. 8