



FIG. 1A

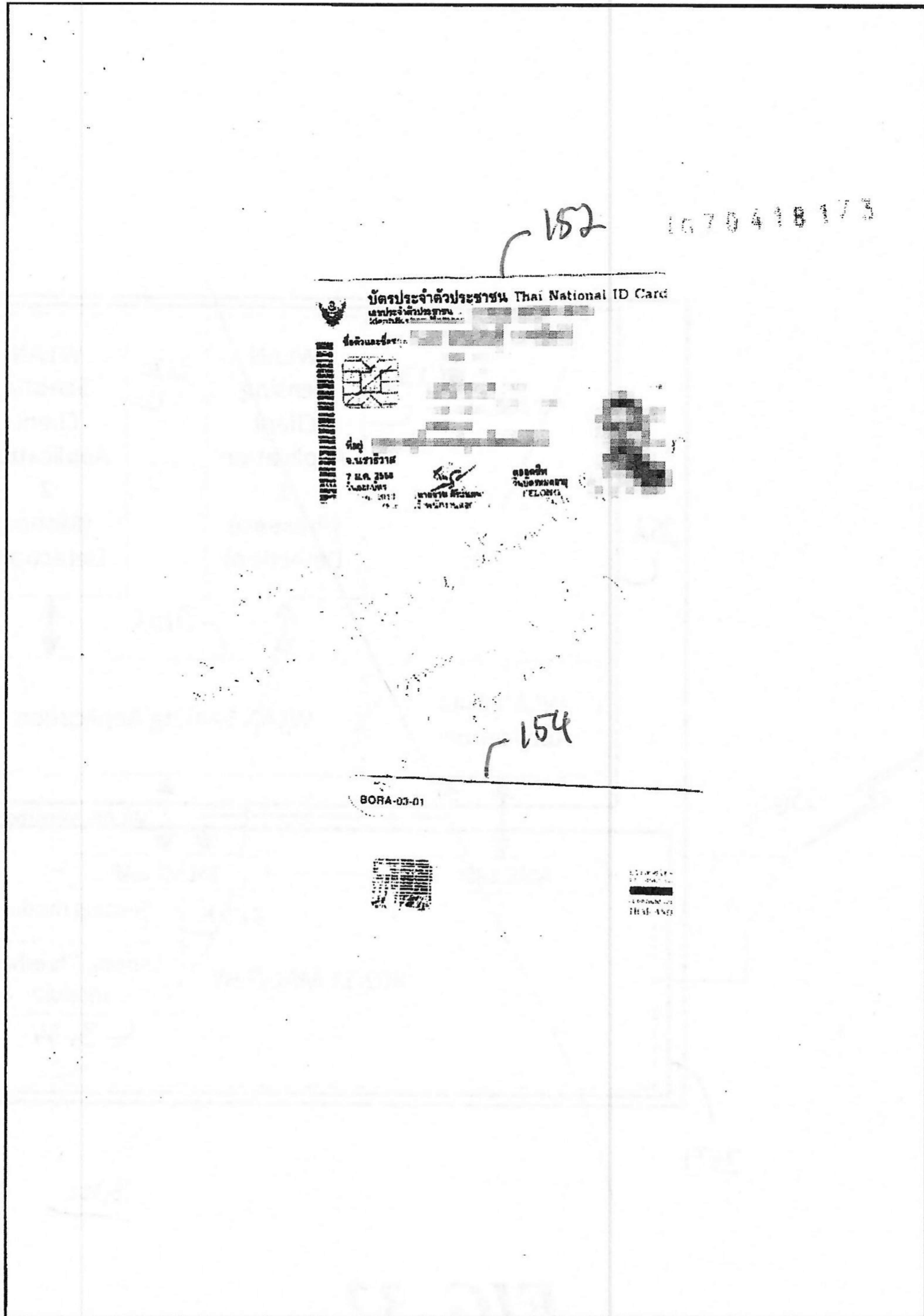


FIG. 1B

150

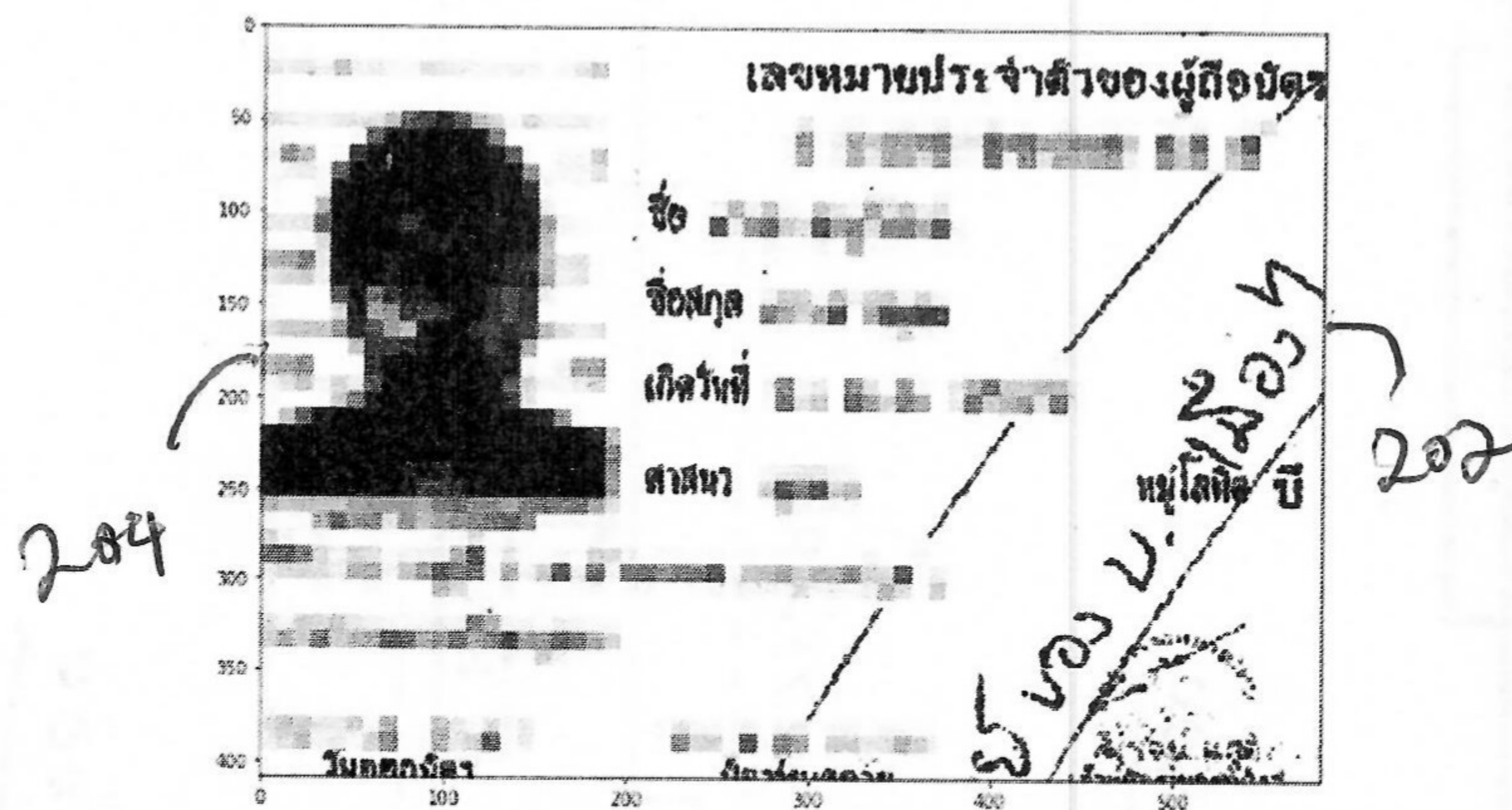


FIG. 2A

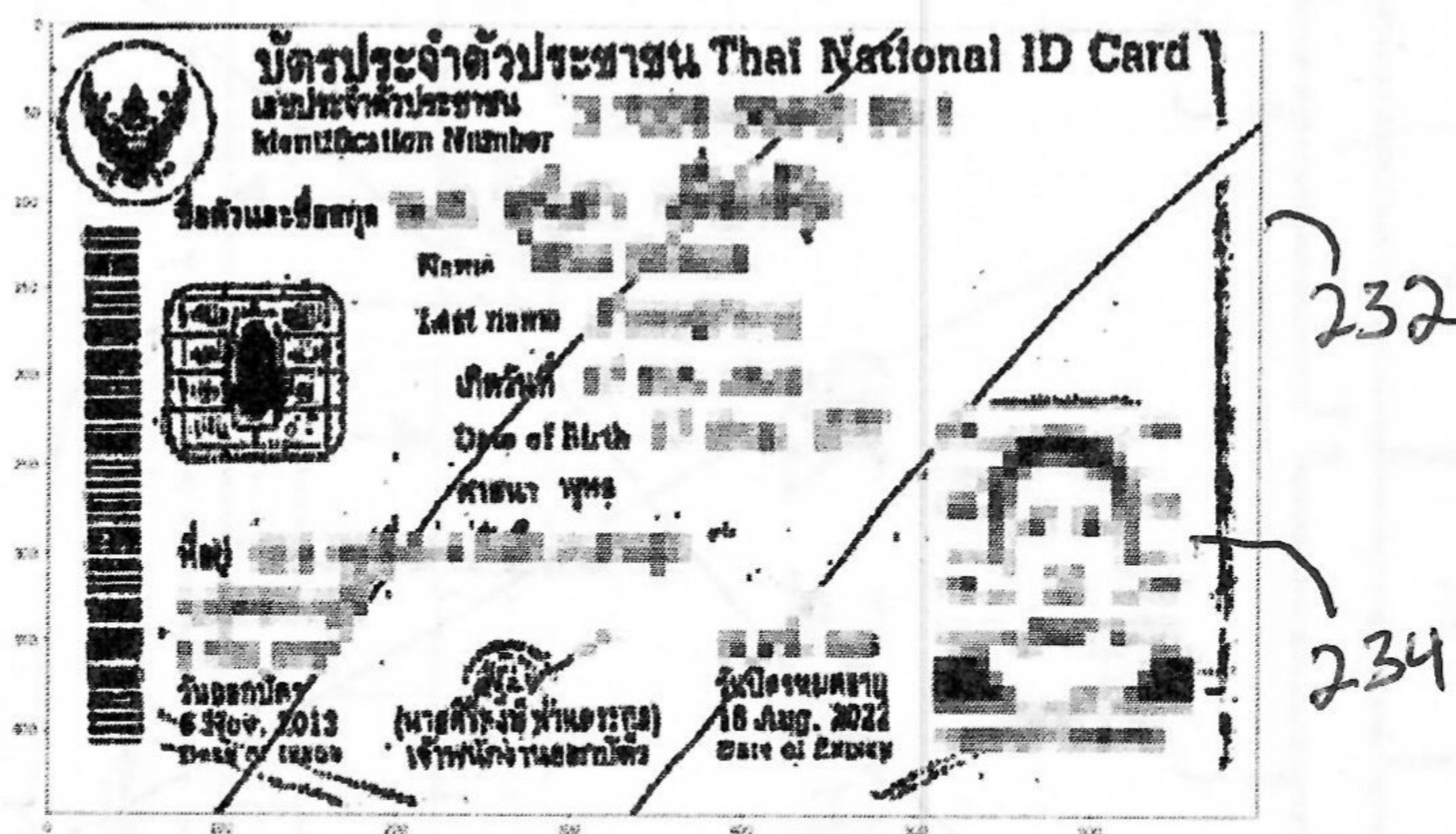


FIG. 2B

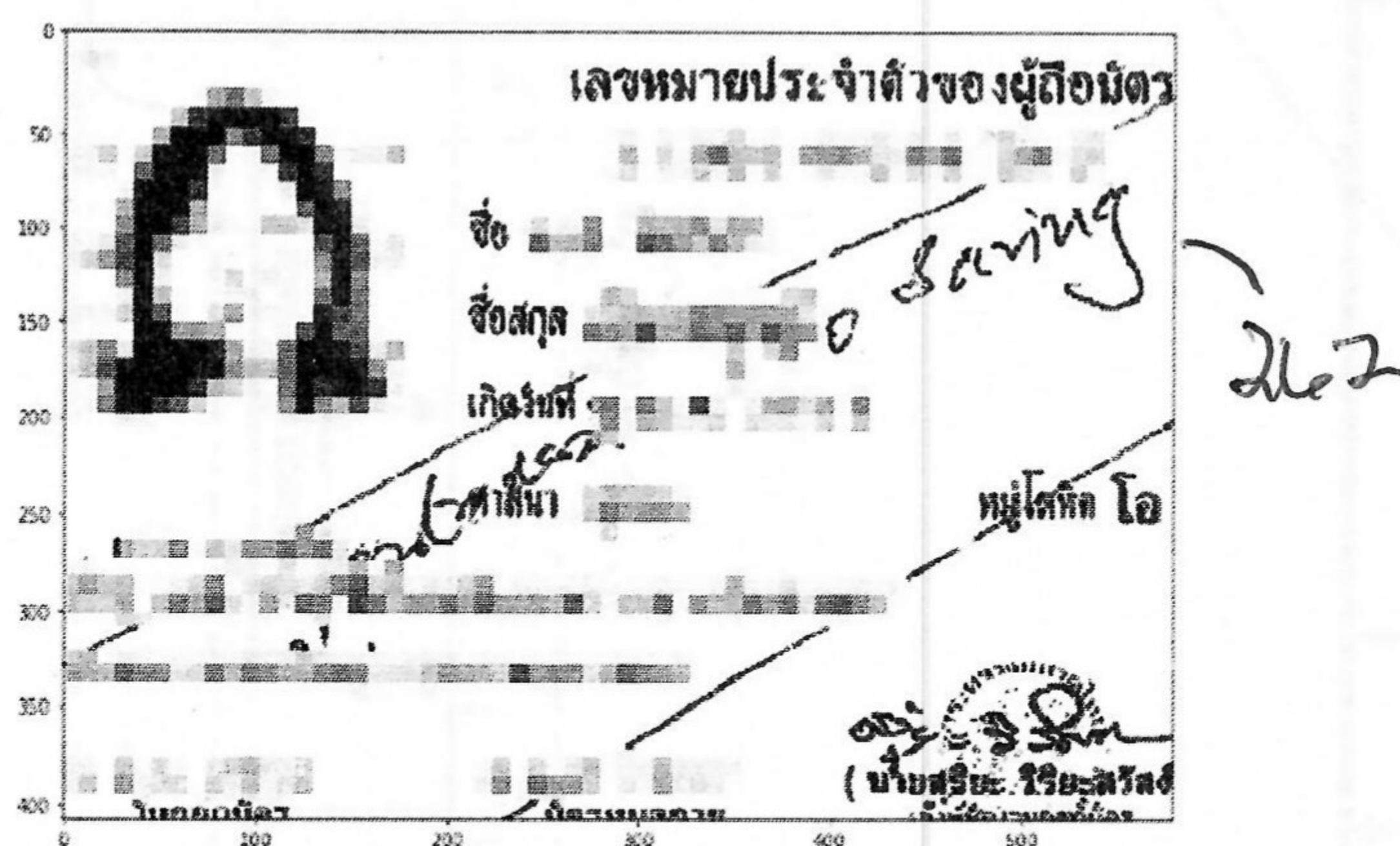


FIG. 2C

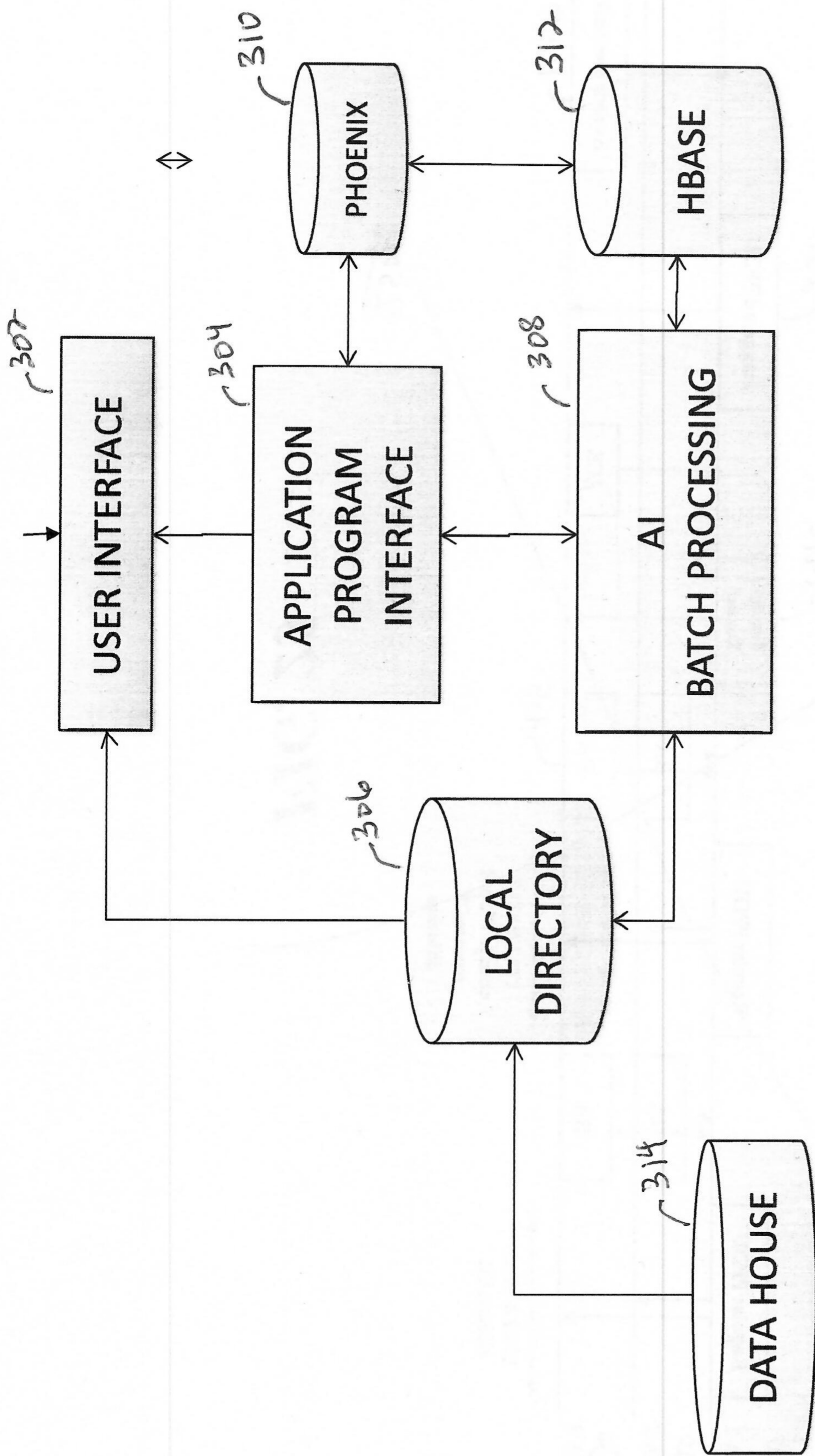


FIG. 3 300

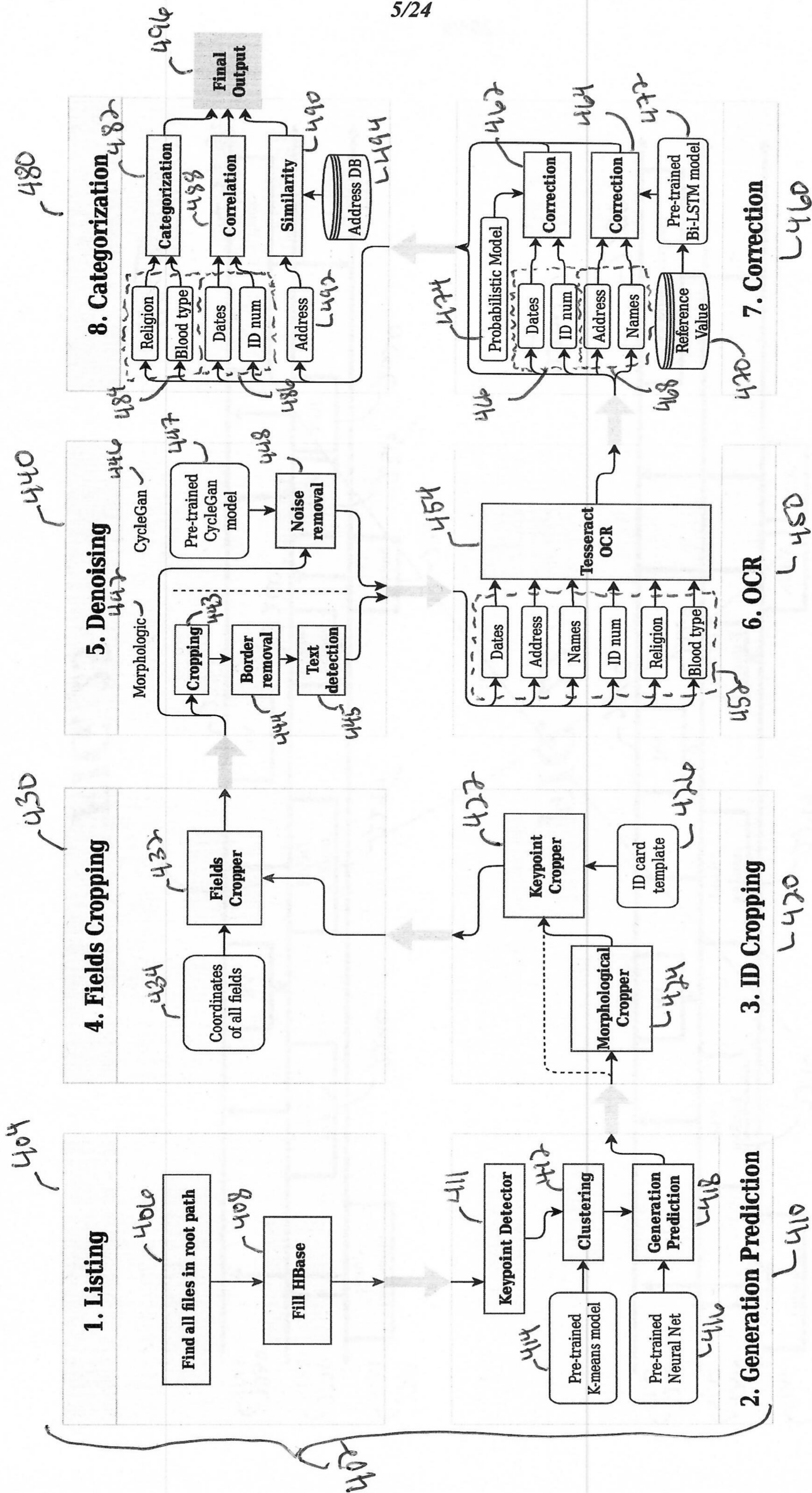
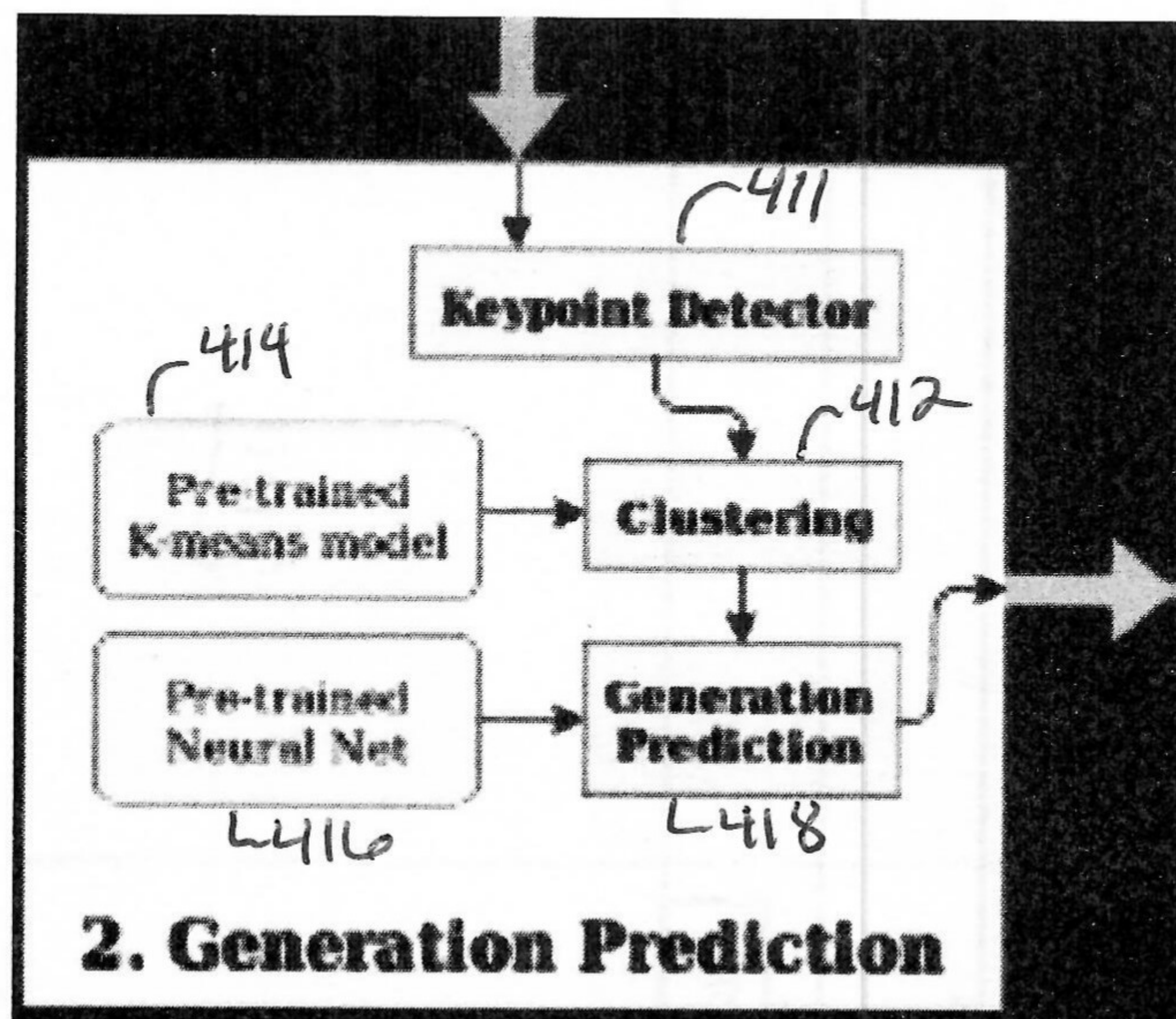
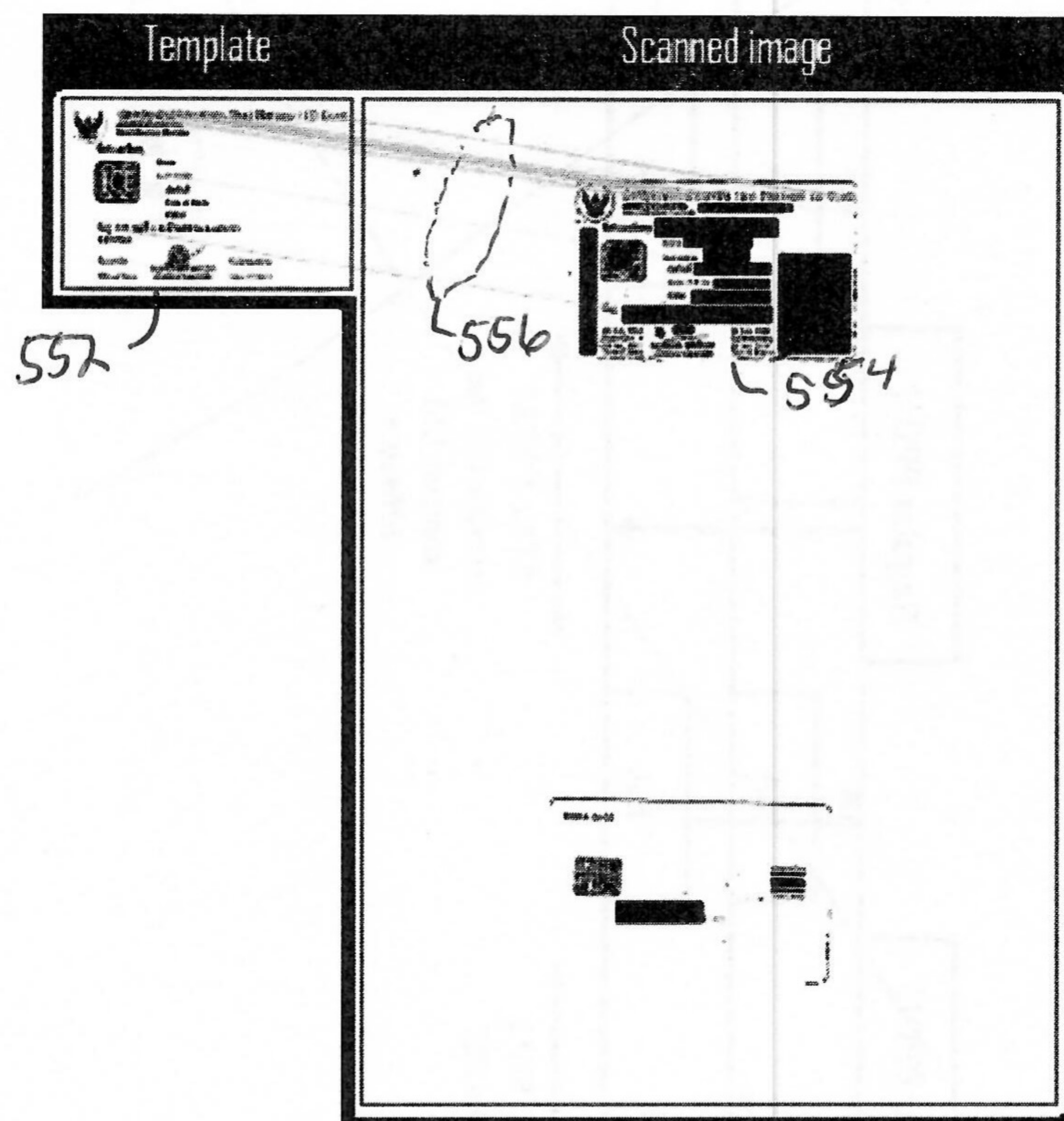


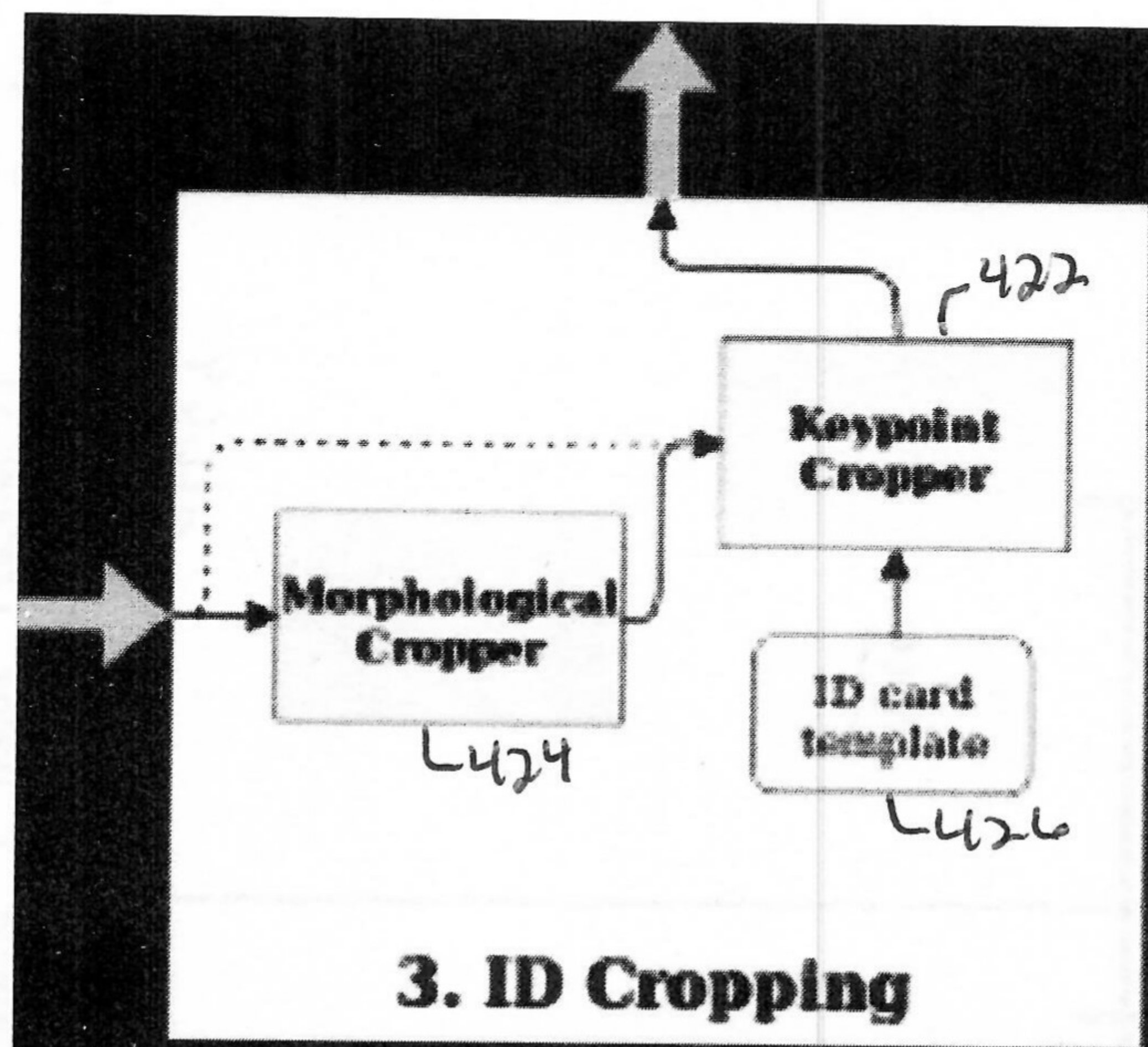
FIG. 4



500 **FIG. 5A** 410

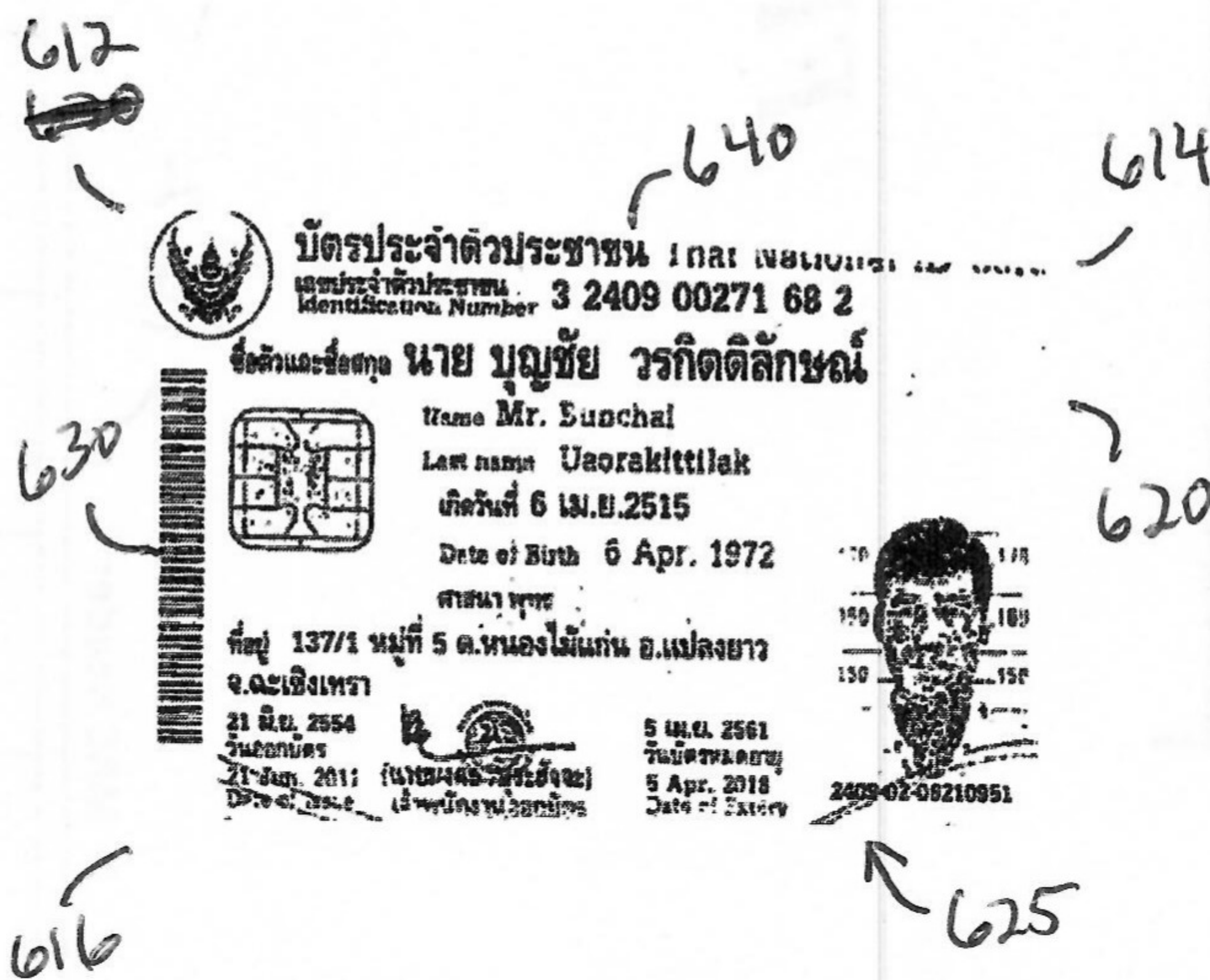


550 **FIG. 5B**



600

FIG. 6A



610

FIG. 6B

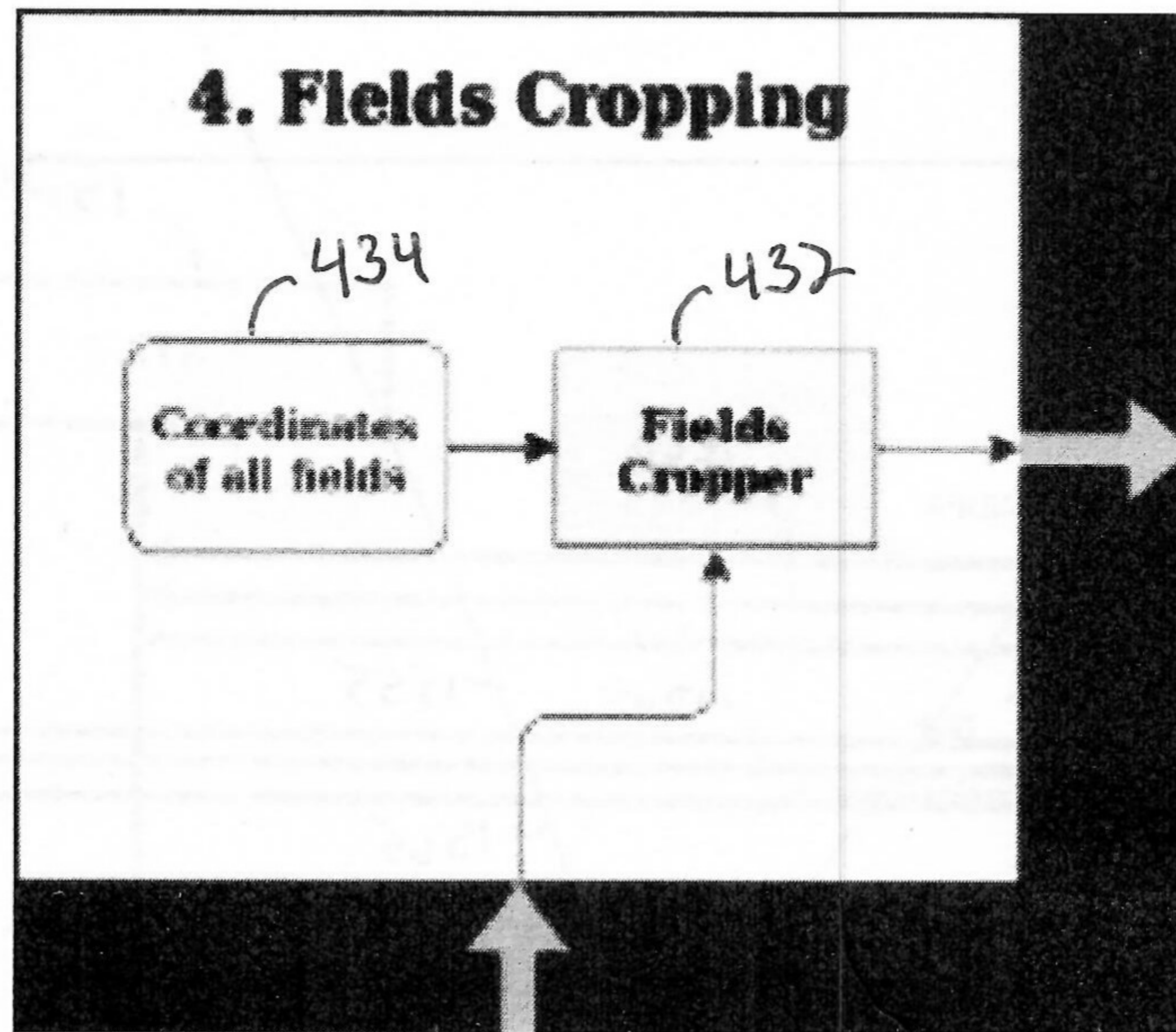
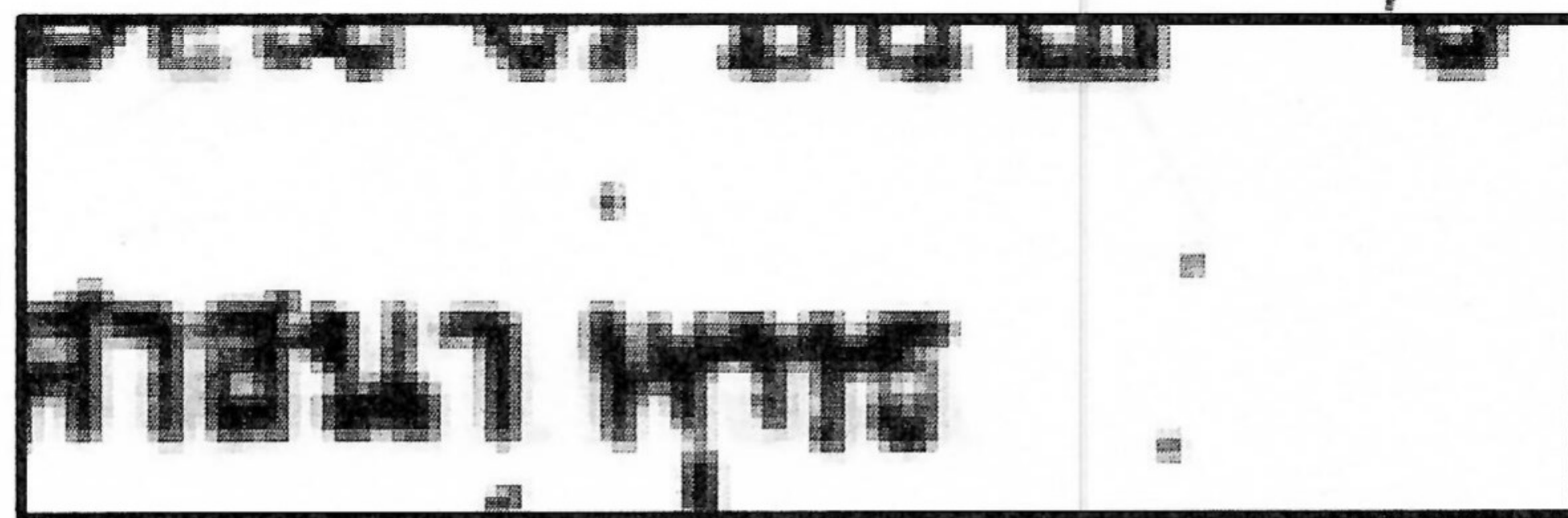


FIG. 7A

700



710

FIG. 7B

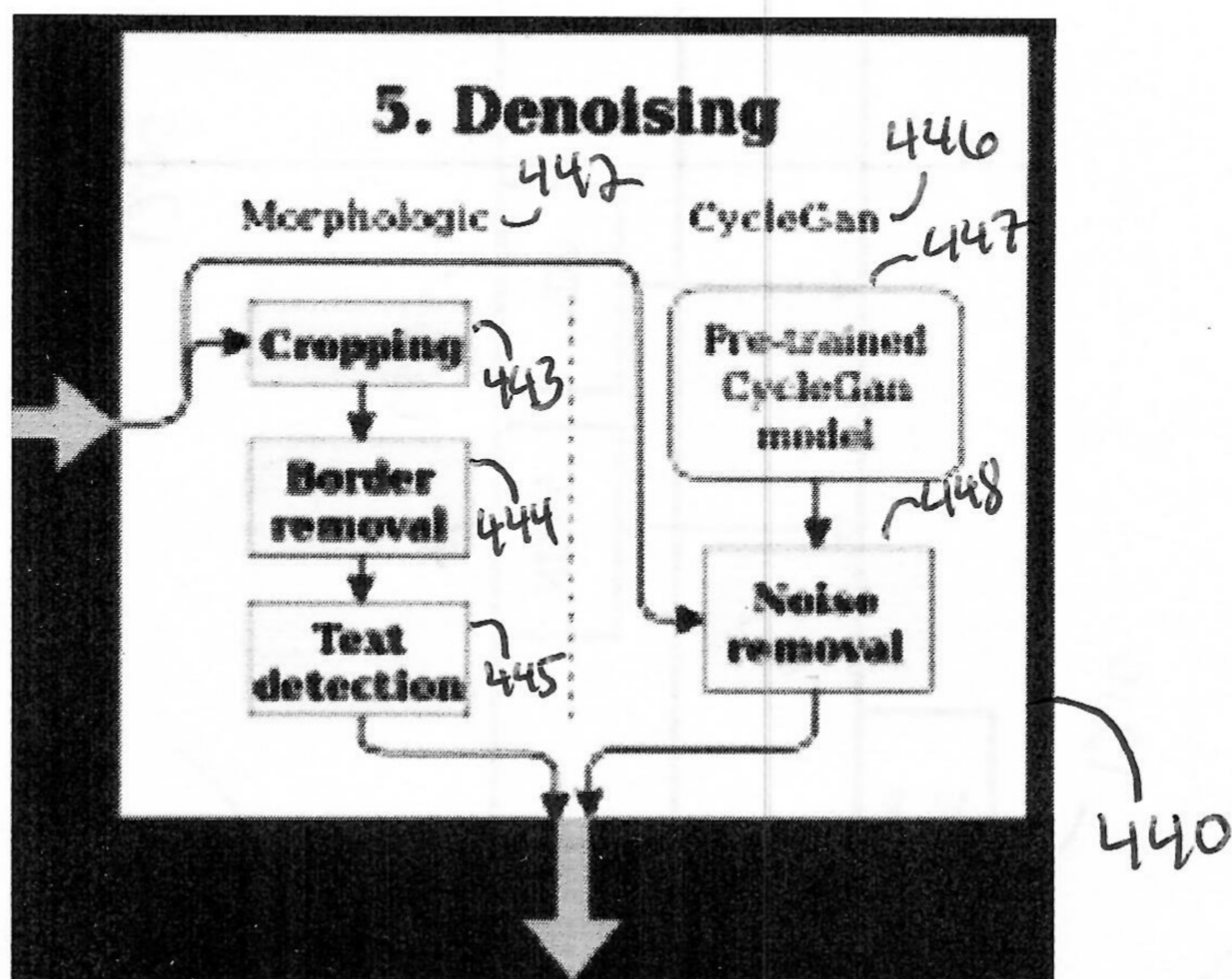


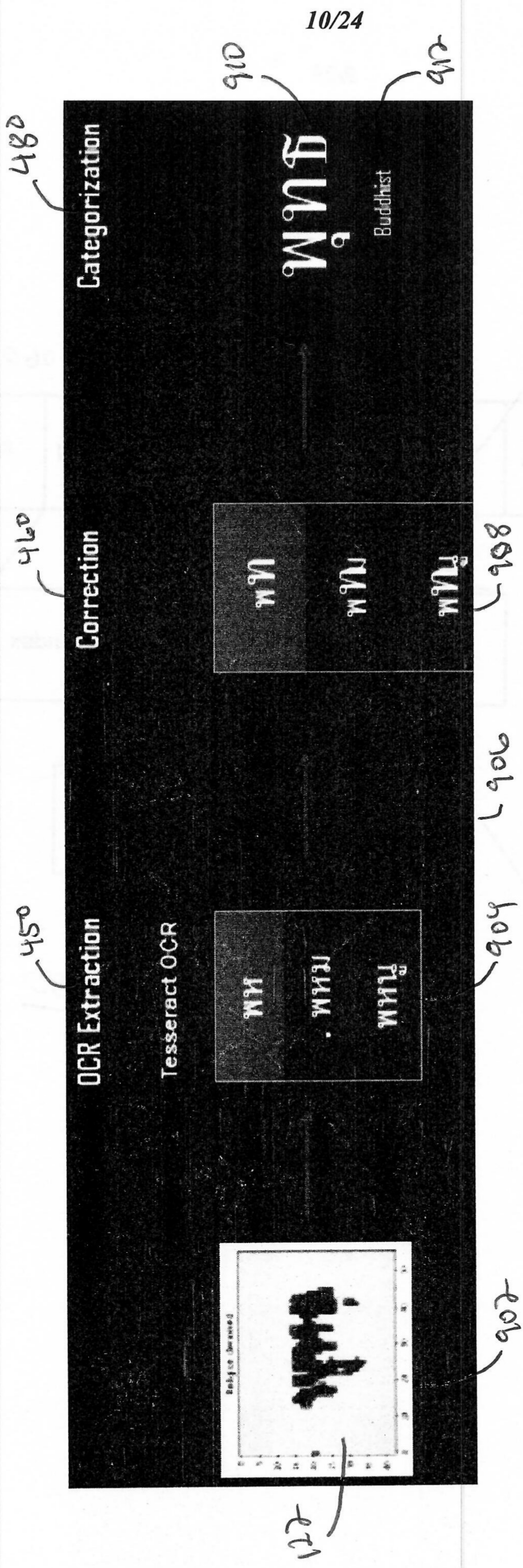
FIG. 8A

800

Noised Field	Denoised Fields
นาง คำฟู แสงสาย ... Mrs. Khamphu	นาง คำฟู แสงสาย
นาง อำนวย เพิ่มพูน ... Mrs. Amnuay	นาง อำนวย เพิ่มพูน
นาง ธิติพันธ์ อินทสุต ... Mrs. Thitiratt	นาง ธิติพันธ์ อินทสุต

810

FIG. 8B



10/24

FIG. 9

900

11/24

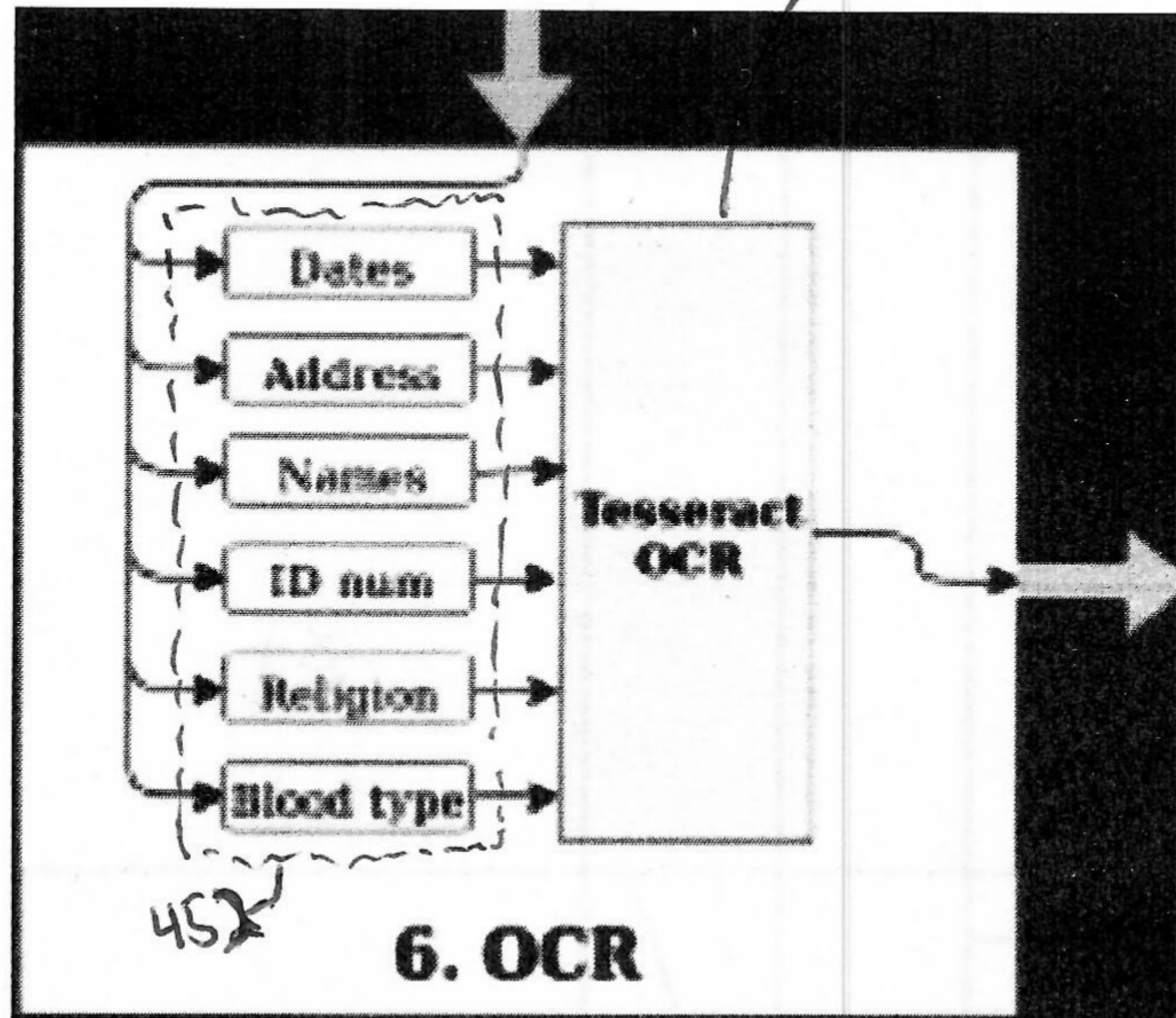


FIG. 10A

1006

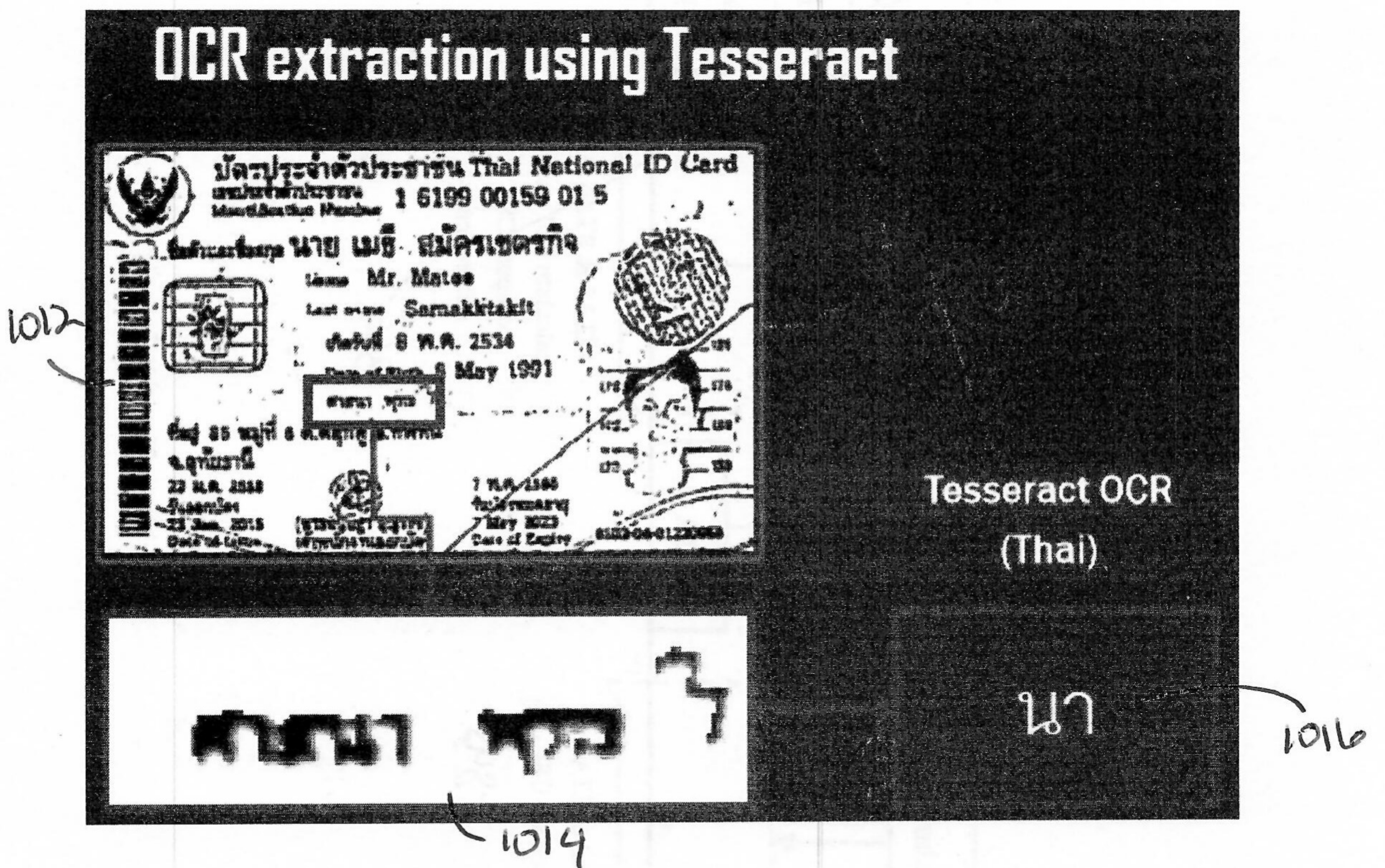


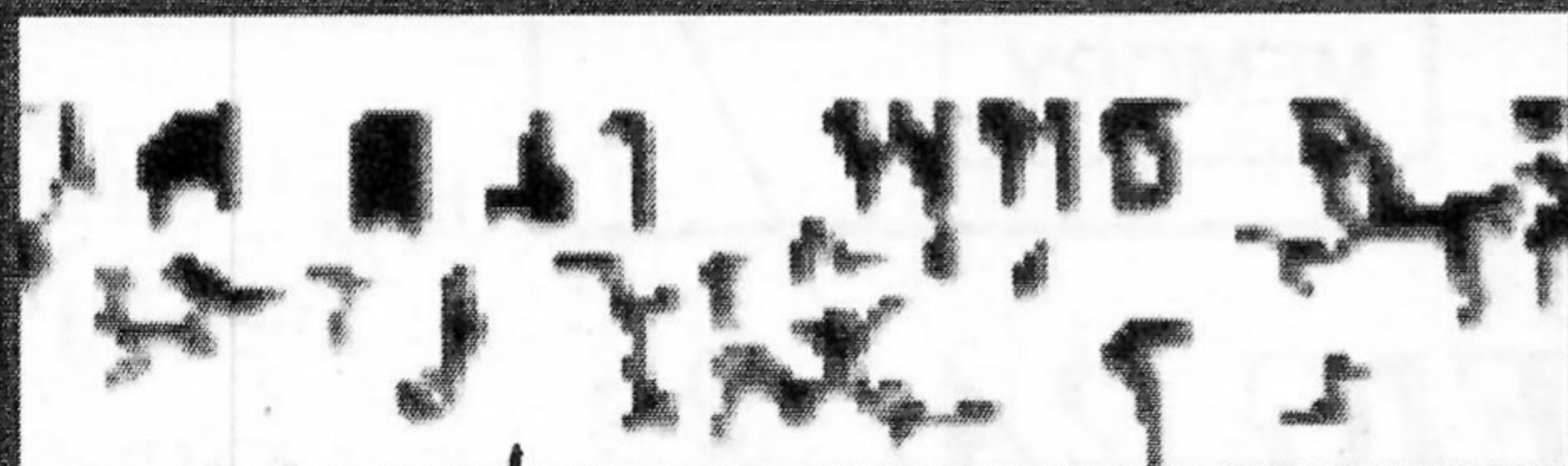
FIG. 10B

12/24

1022



Tesseract OCR
(Thai)



1026

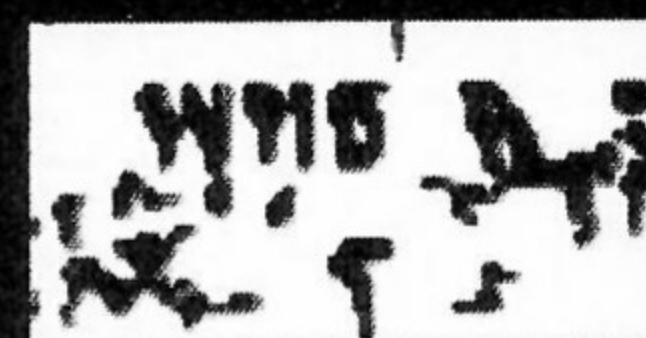
1024

1020

FIG. 10C

OCR extraction using Tesseract

Choosing a set of configurations and rescalings:



- Page Segmentation Mode (PSM)

Prediction with default configurations: []

Tesseract configuration: [--oem 1 --psm 1 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 3 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 4 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 5 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 6 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 7 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 8 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 9 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 10 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 11 -c preserve_interword_spaces=1]
Tesseract configuration: [--oem 1 --psm 12 -c preserve_interword_spaces=1]

Prediction: []

Prediction: []

Prediction: [นาย วิหะ]

Prediction: [นาย]

Prediction: [นาย วิหะ]

Prediction: [ร ห]

Prediction: [นาย]

Prediction: [นาย]

Prediction: [นาย]

Prediction: [ร ห]

Prediction: [นาย - น]

1034

1030

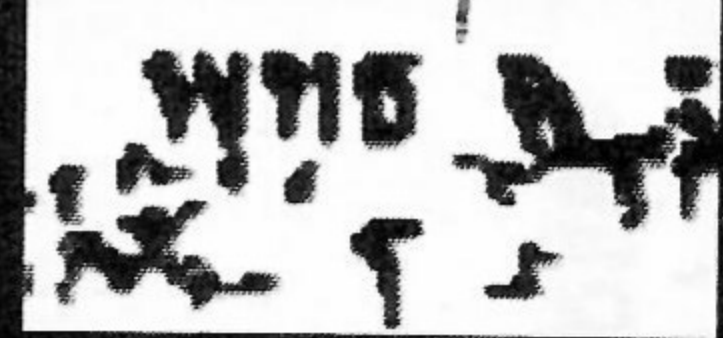
FIG. 10D

Choosing a set of configurations and rescalings:

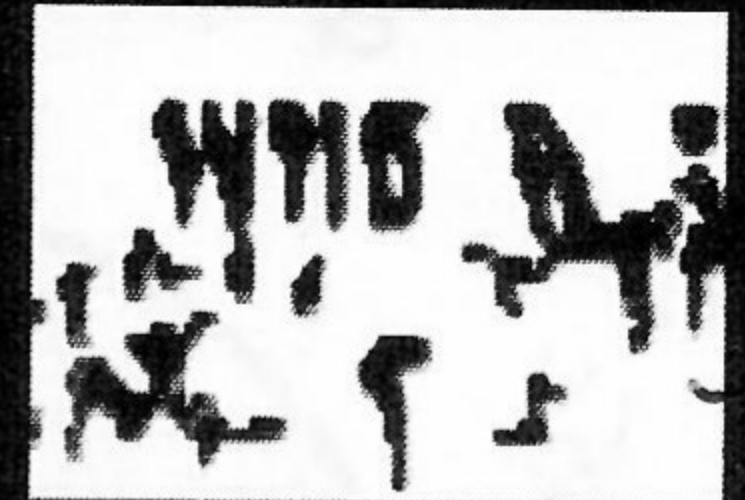
- Rescalings

Prediction with default configurations: []

Rescaling: [1.0]	Prediction: [นพ]
Rescaling: [1.2]	Prediction: [น]
Rescaling: [1.4]	Prediction: [นนพ]
Rescaling: [1.6]	Prediction: [น]
Rescaling: [1.8]	Prediction: [น]
Rescaling: [2.0]	Prediction: [น ร น]
Rescaling: [2.2]	Prediction: [นร]



Rescaled x 1.4



Rescaled x 2.0

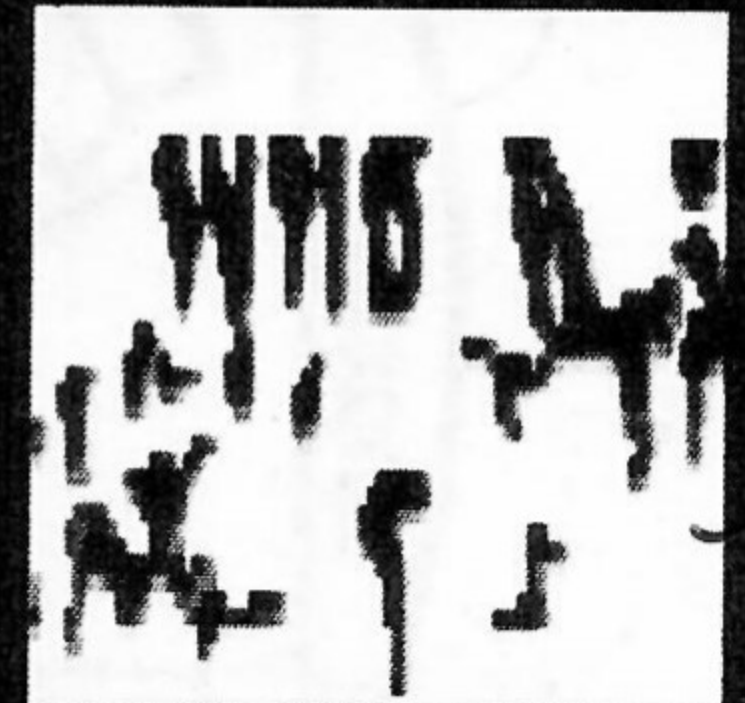


FIG. 10E

Fields	PSMs used	Rescaling factors	Number of predictions
First name & last name	3, 8, 12	1, 1.2, 1.4, 1.6, 1.8	15
Religion	8, 10, 12	-	3
Blood type	8, 10, 13	-	3

FIG. 10F

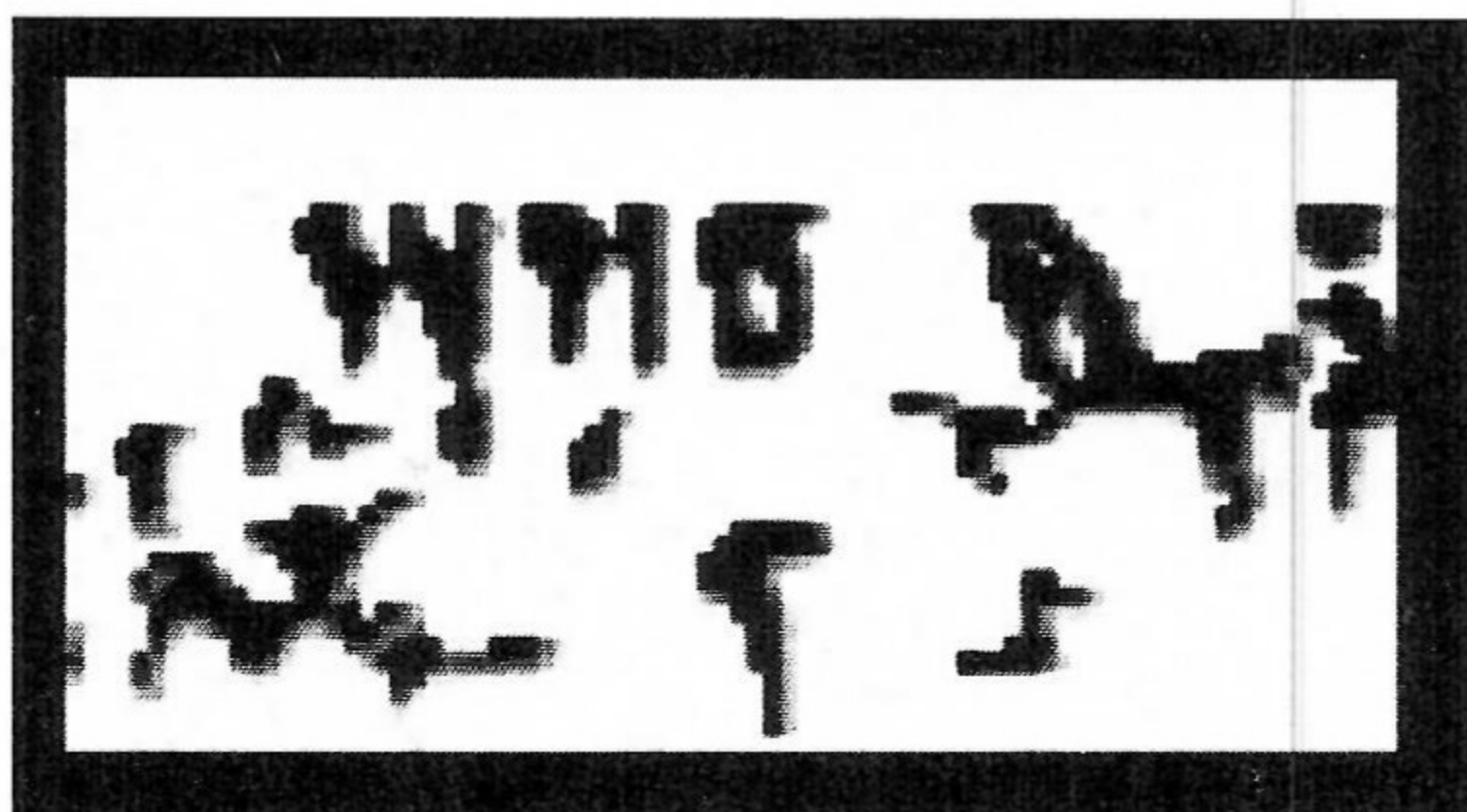
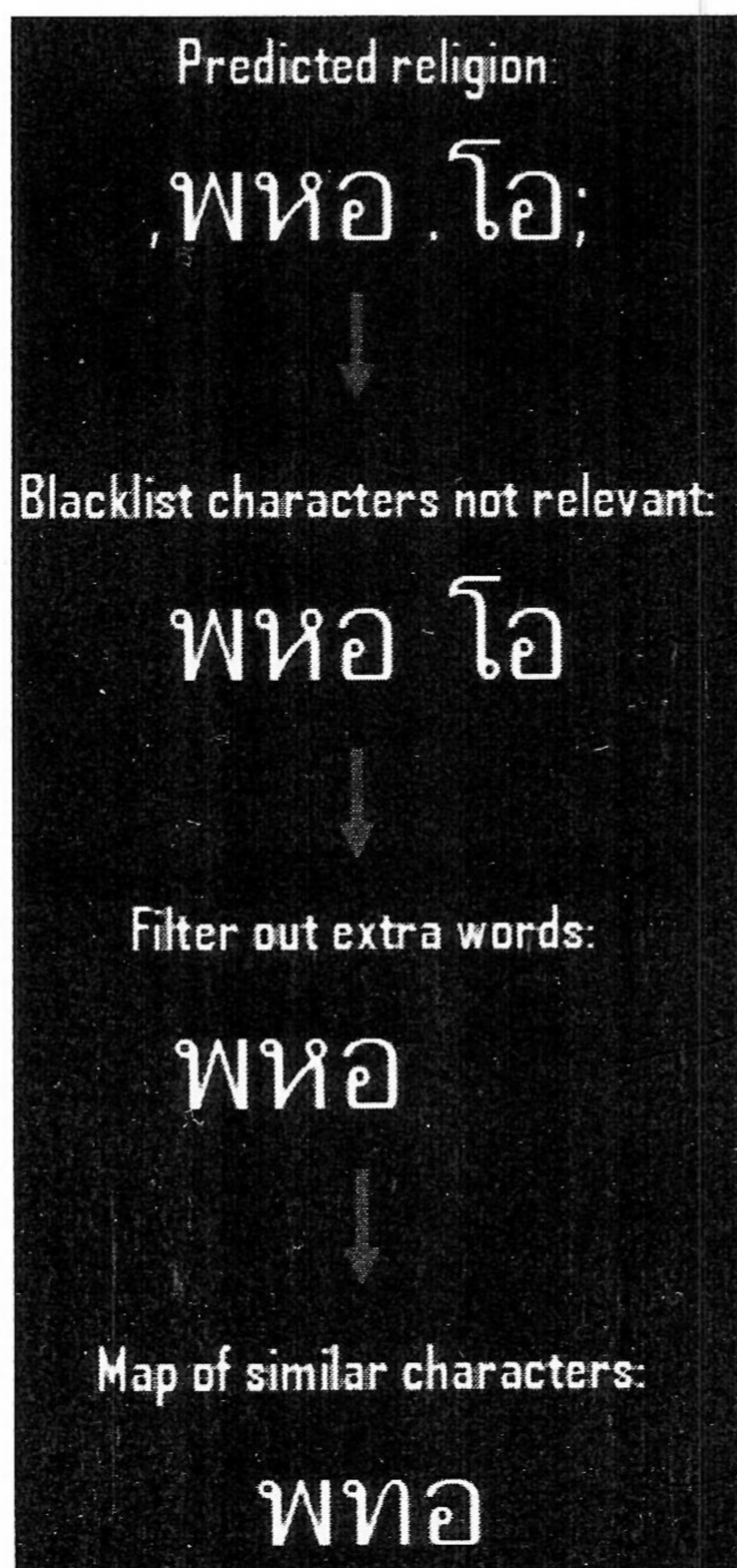


FIG. 11A

1100



1152

1154

1156

1158

FIG. 11B

1150

SPELLCHECKER

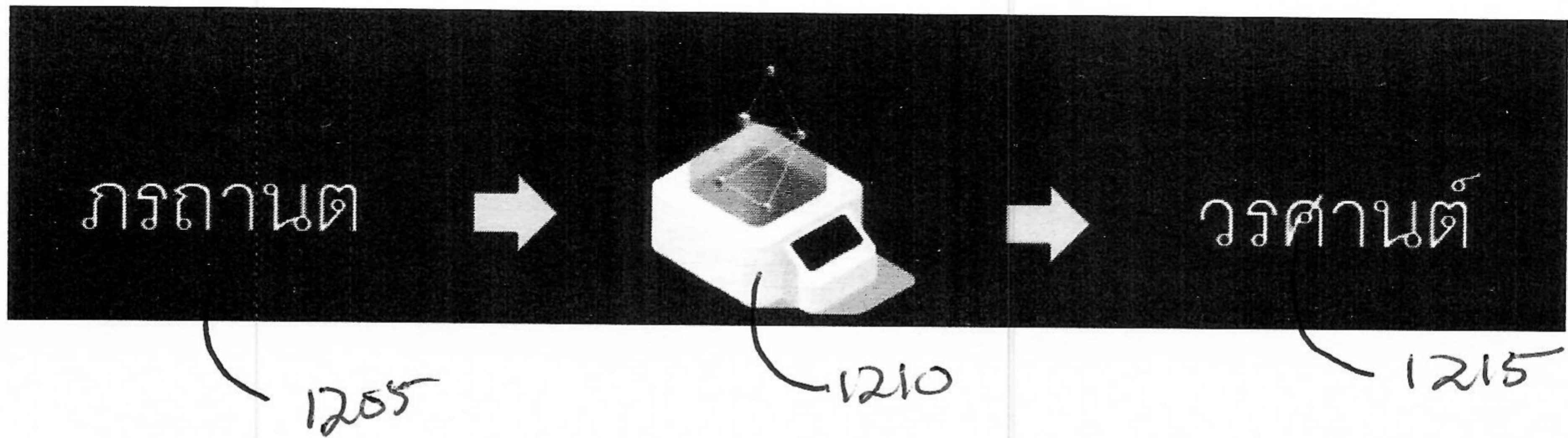


FIG. 12

1305 1310 1315

Religion (Thai)	Religion (English)	Freq.
พุทธ	Buddhist	94.50%
อิสลาม	Islam	4.29%
คริสต์	Christian	1.17%
ฮินดู	Hindu	0.03%

1300

FIG. 13A

1335 1340 1345

Title (Thai)	Title (English)	Freq.
นาย	Mr.	43.98%
นาง	Mrs.	22.63%
น.ส.	Miss	30.89%
ค.ช.	Master	0.53%
พระ	Phra	0.23%
พระครู	Phrakhru	0.08%
...	...	...

FIG. 13B1330

1365 1370 1375

Blood type (Thai)	Blood type (English)	Freq.
เอ	A	16.9%
บี	B	36.8%
เอบี	AB	4.97%
โอ	O	40.8%

FIG. 13C1360

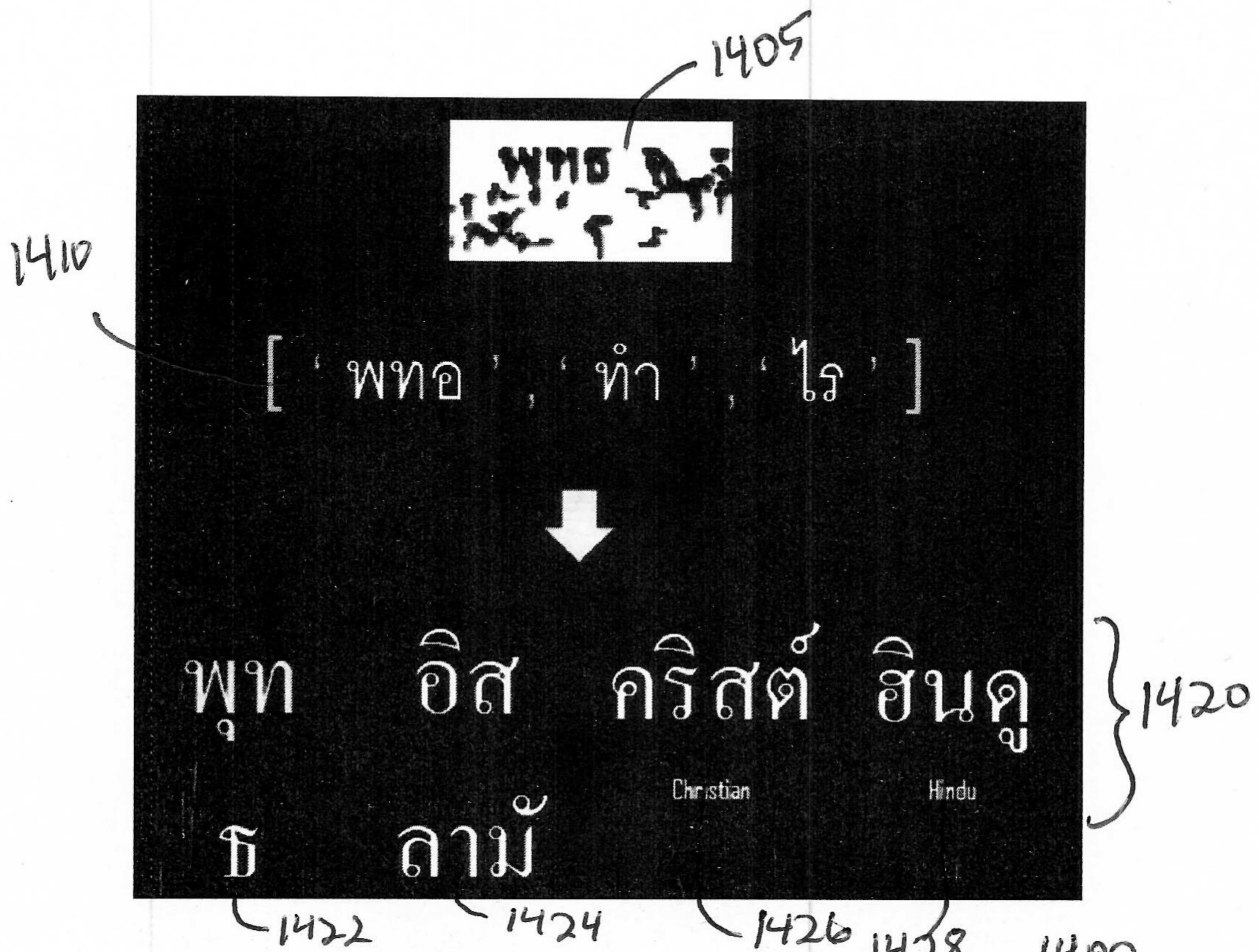


FIG. 14A

1435

1436

1438

1440

1442

1444

1446

Predictio n	Correct religion	Score
พทอ	พุทธ	0.91
	อิสลาม	0.06
	คริสต์	0.03
	ฮินดู	0
ทำ	พุทธ	0.64
	อิสลาม	0.11
	คริสต์	0
	ฮินดู	0.05
ไร	พุทธ	0.50
	อิสลาม	0
	คริสต์	0
	ฮินดู	0.05

$$C(x_1, x_2, \dots, x_n) = \frac{x_1^2 + x_2^2 + \dots + x_n^2}{x_1 + x_2 + \dots + x_n}$$

1450

Correct religion	Final score
พุทธ	0.73
อิสลาม	0.09
คริสต์	0.03
ไร	0.05

1452 1454 1430

FIG. 14B

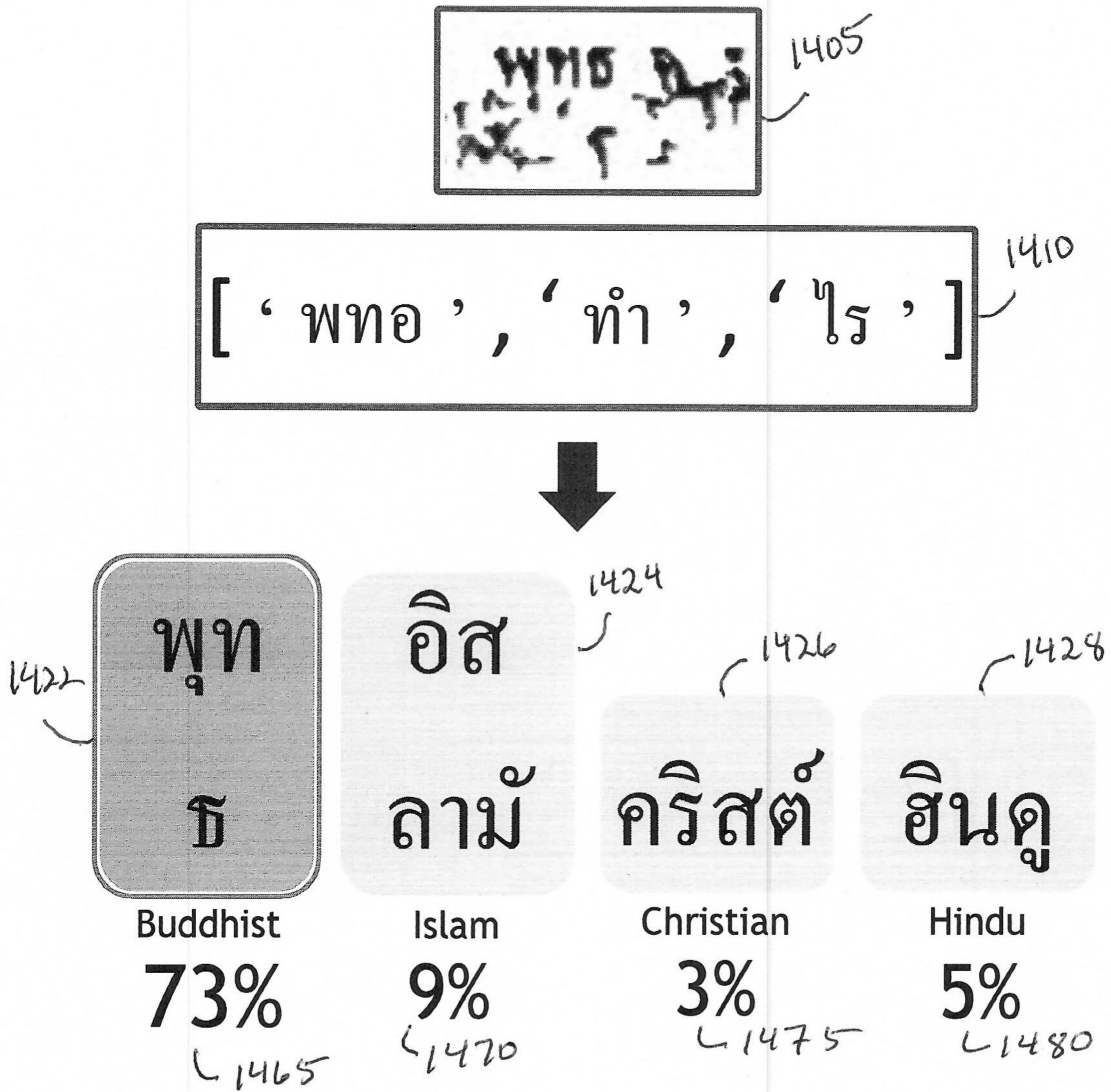
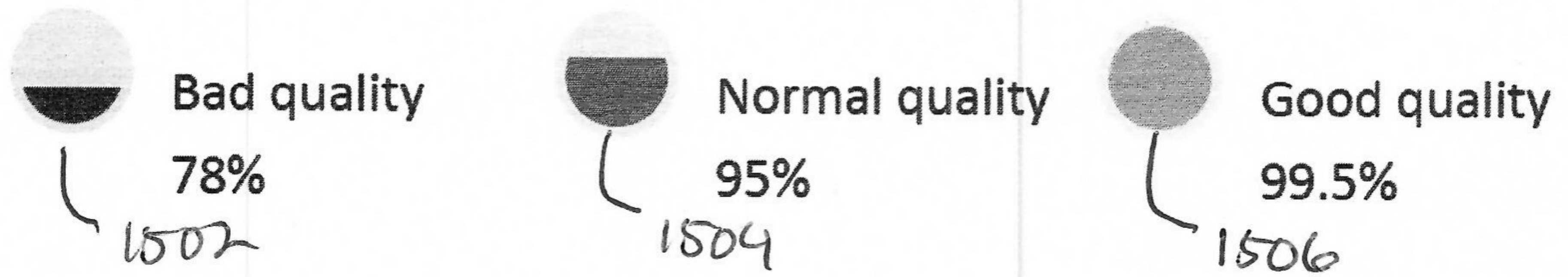


FIG. 14C

14160

ACCURACY OF ID CARD PREDICTION



1560

FIG. 15A

ACCURACY OF CROPPING

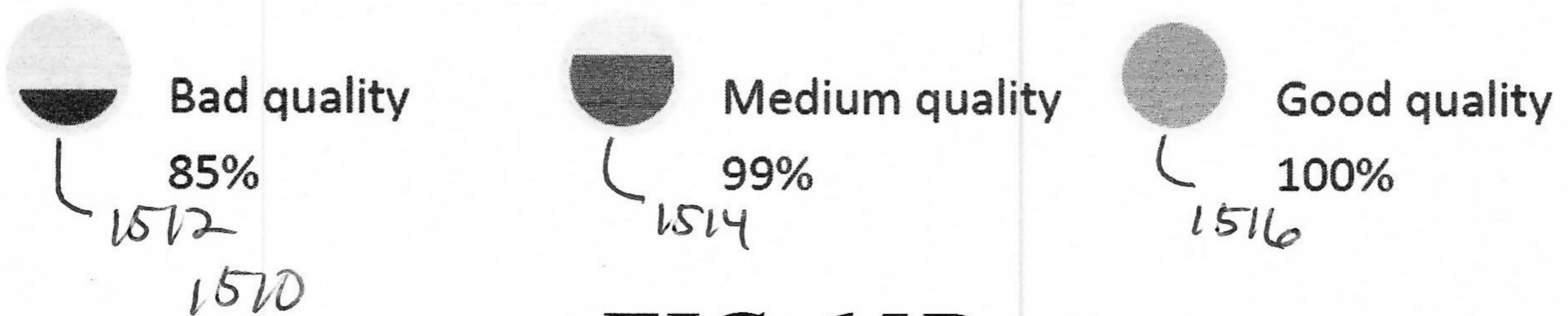
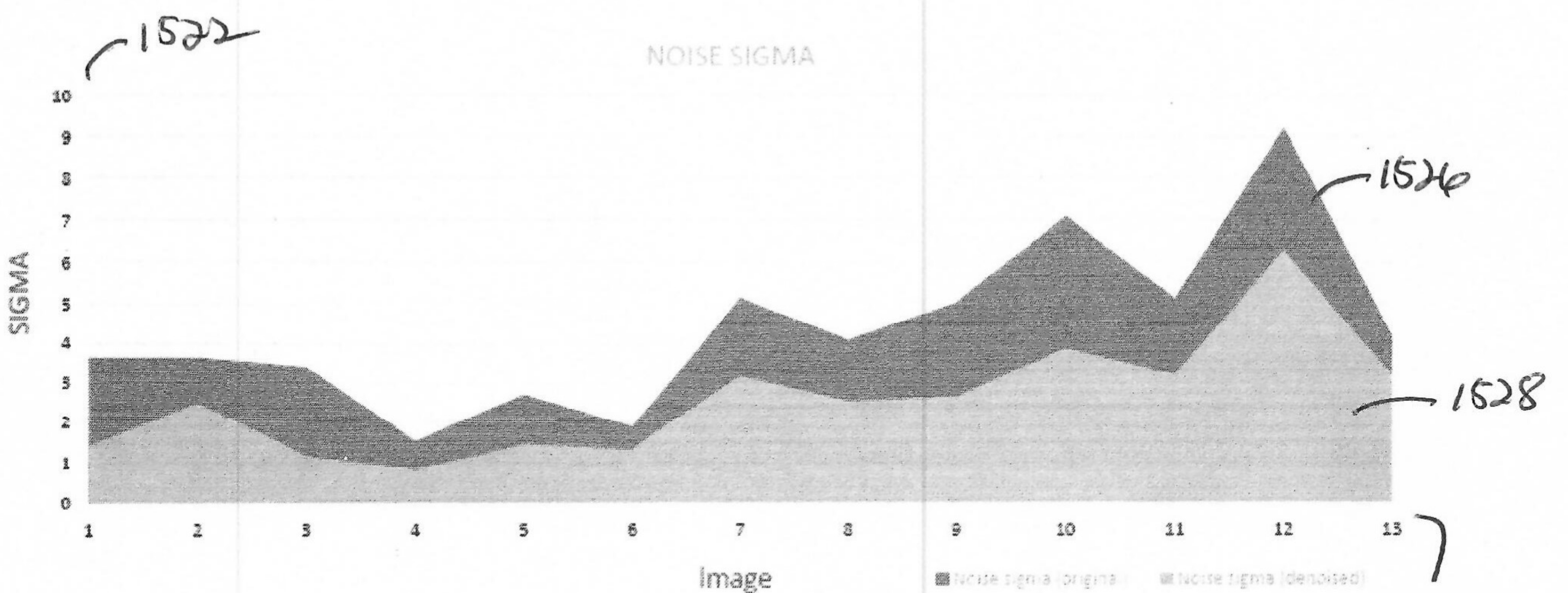


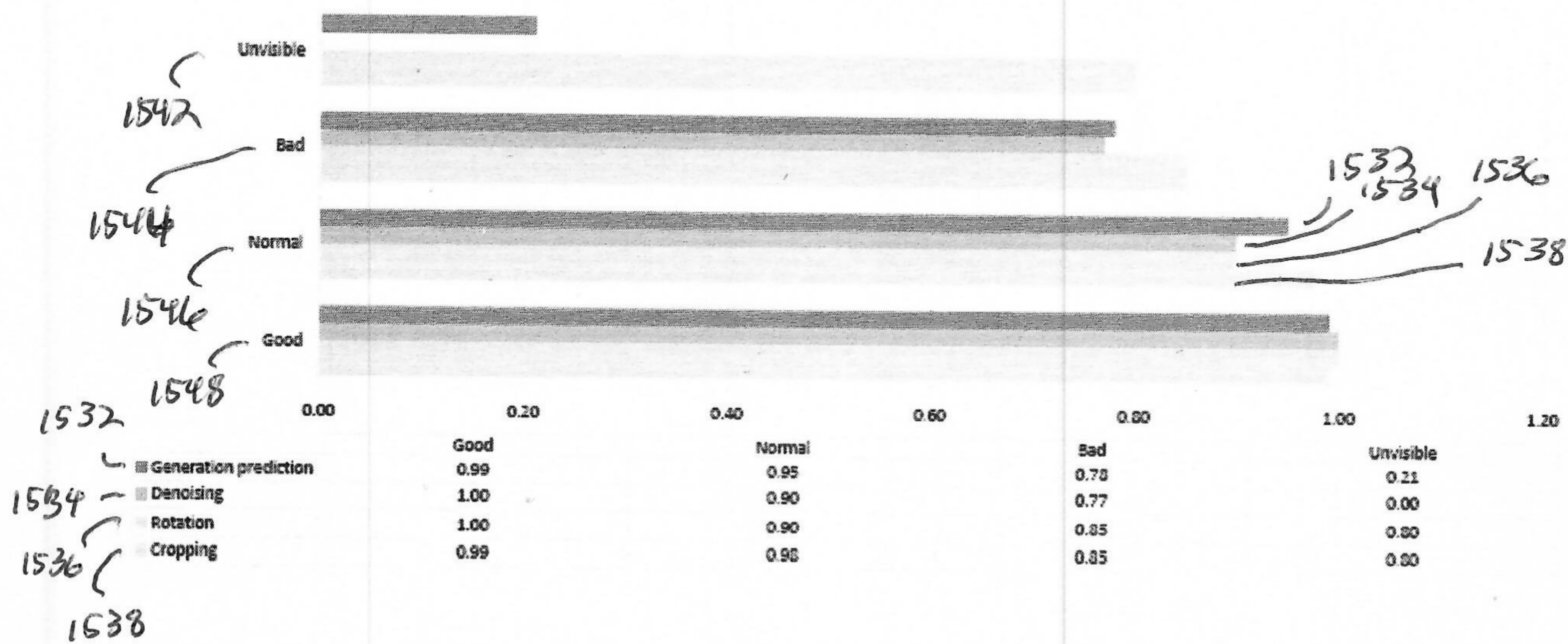
FIG. 15B



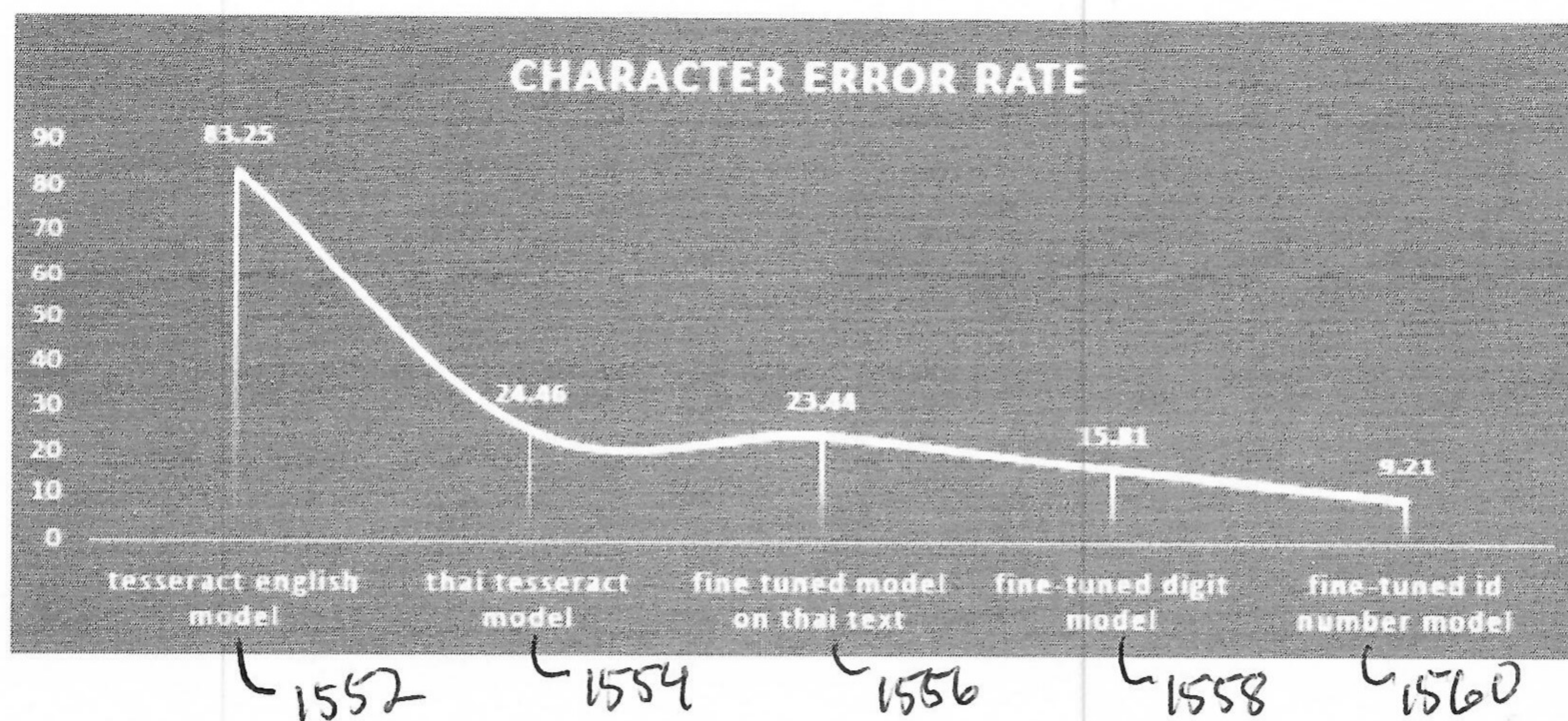
1520

FIG. 15C

Accuracy of images preprocessing per quality cluster



1530

FIG. 15D

1550

FIG. 15E

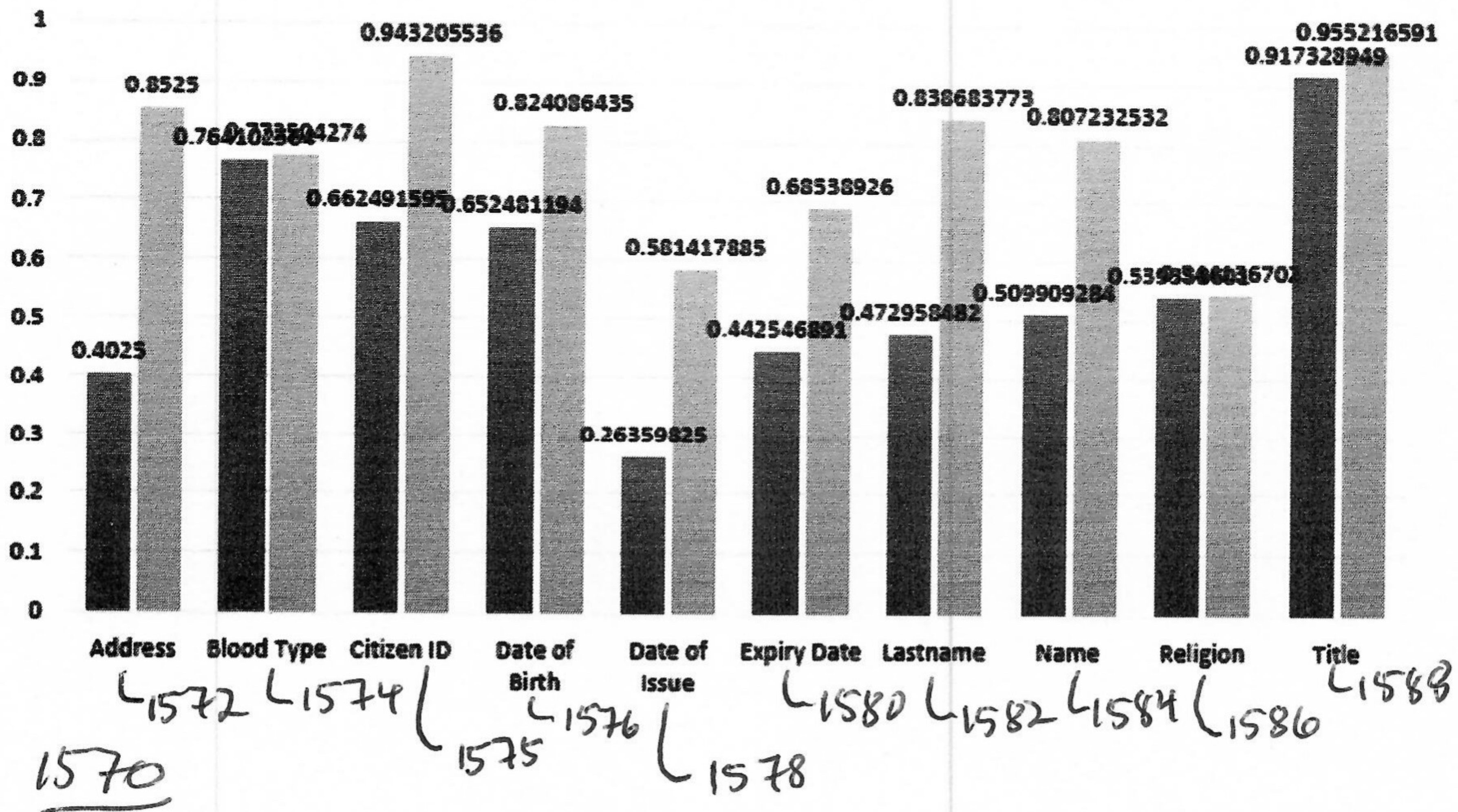


FIG. 15F

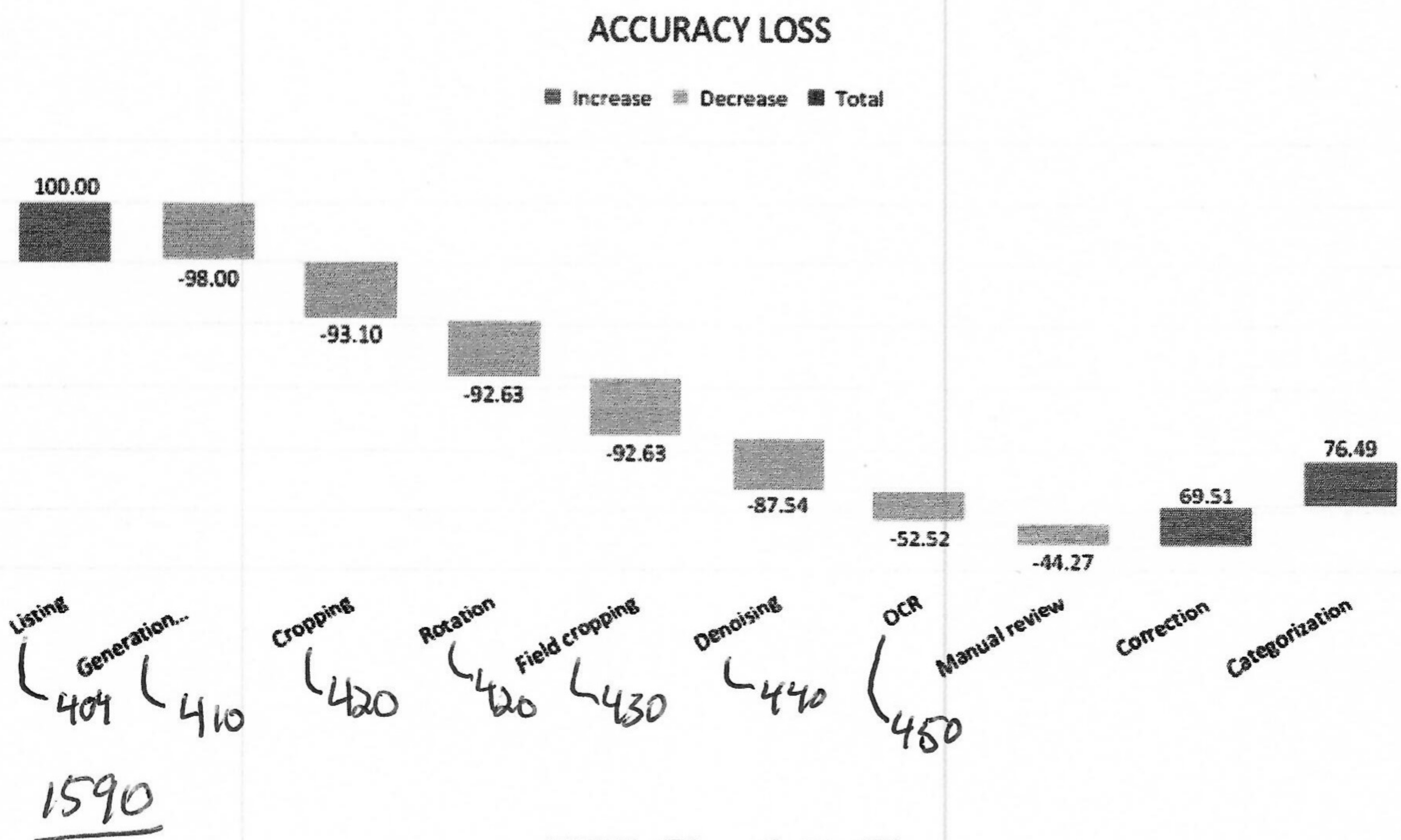


FIG. 15G

Steps	Lite mode (sec)	Full mode (sec)
Listing	0.001	0.001
409 Generation prediction	0.007	0.007
410 Cropping & Rotation	0.1	1
420 Field cropping	0.003	0.003
430 Denoising	0.2	2
440 OCR	29	112
450		

FIG. 16A

Steps	Lite mode (sec)	Full mode (sec)
Listing	0.03	0.05
409 Generation prediction	1	1
410 Cropping & Rotation	15	23
420 Field cropping	0.005	0.02
430 Denoising	5	5
440 OCR	46	112
450		

FIG. 16B

Lite mode

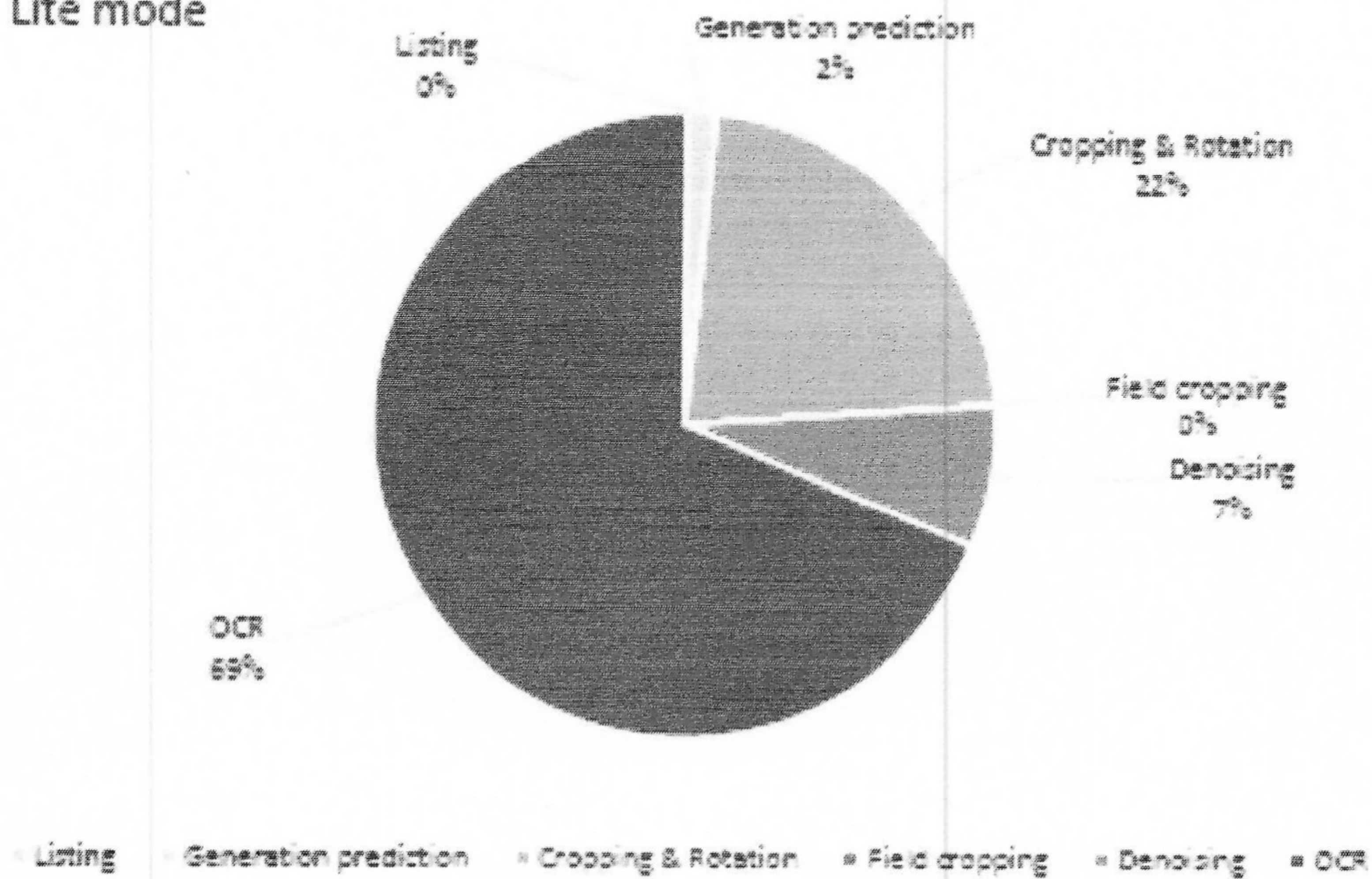


FIG. 17A

1700

Full version

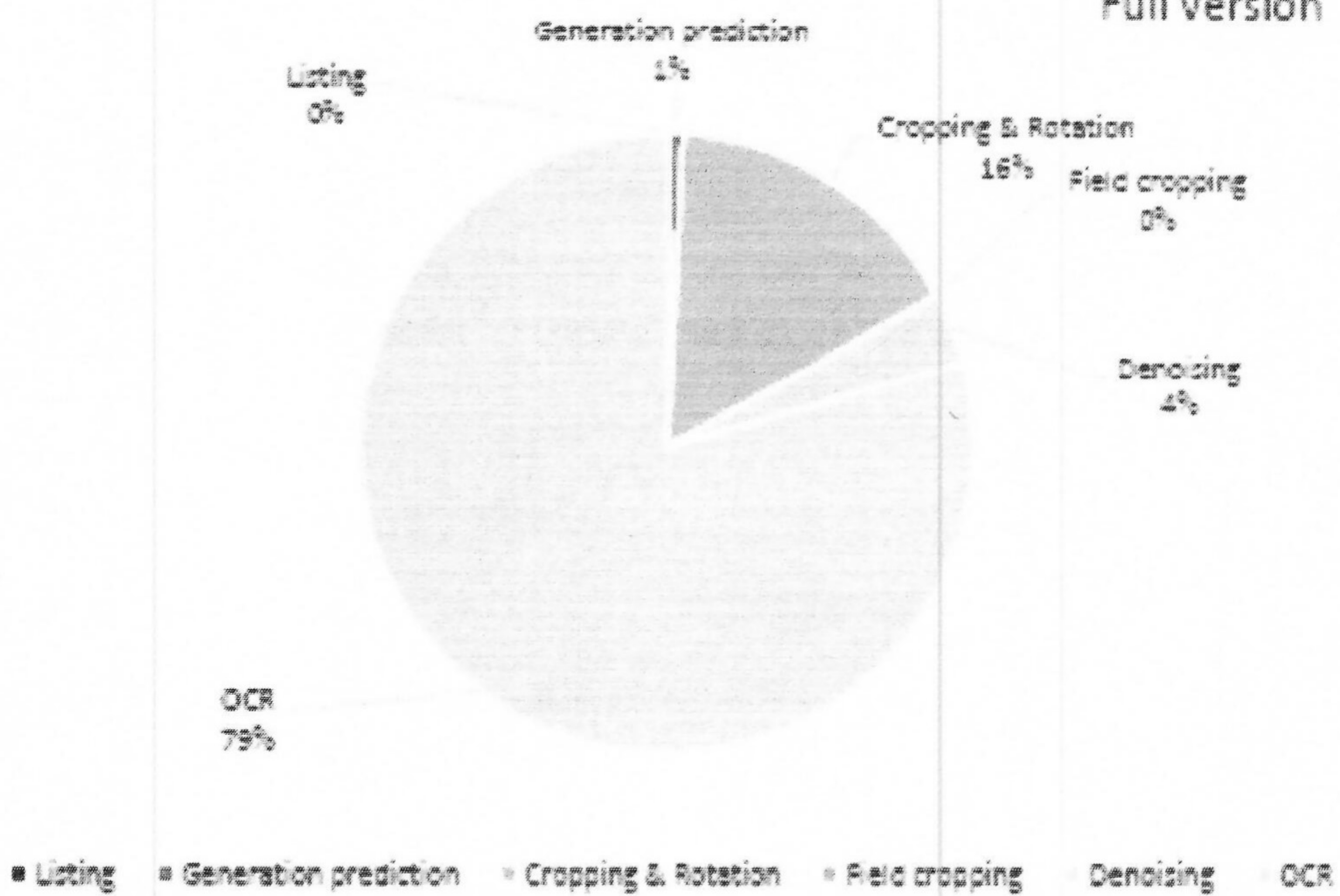


FIG. 17B

1750

Lite mode (sec)

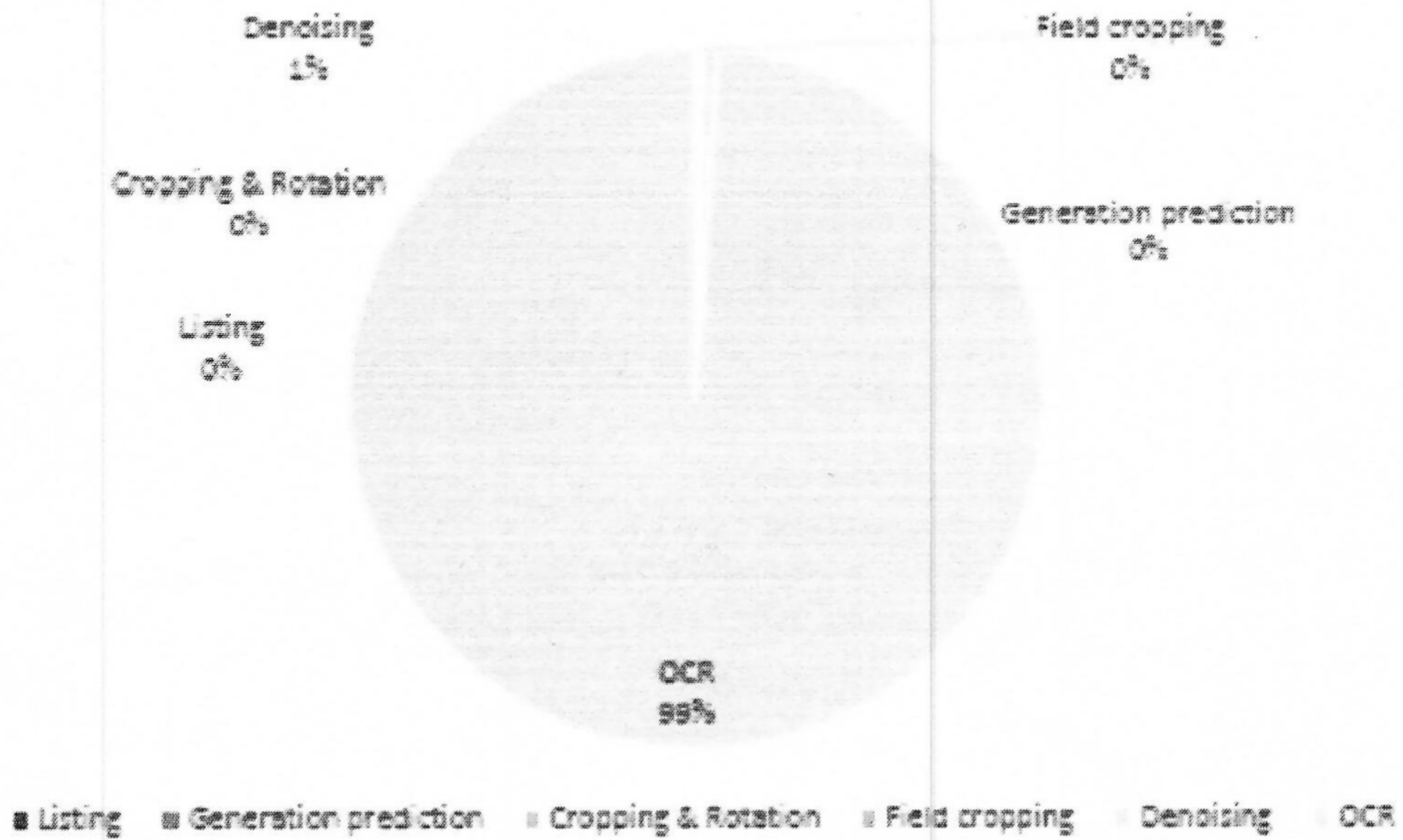


FIG. 18A

1800

Full mode (sec)

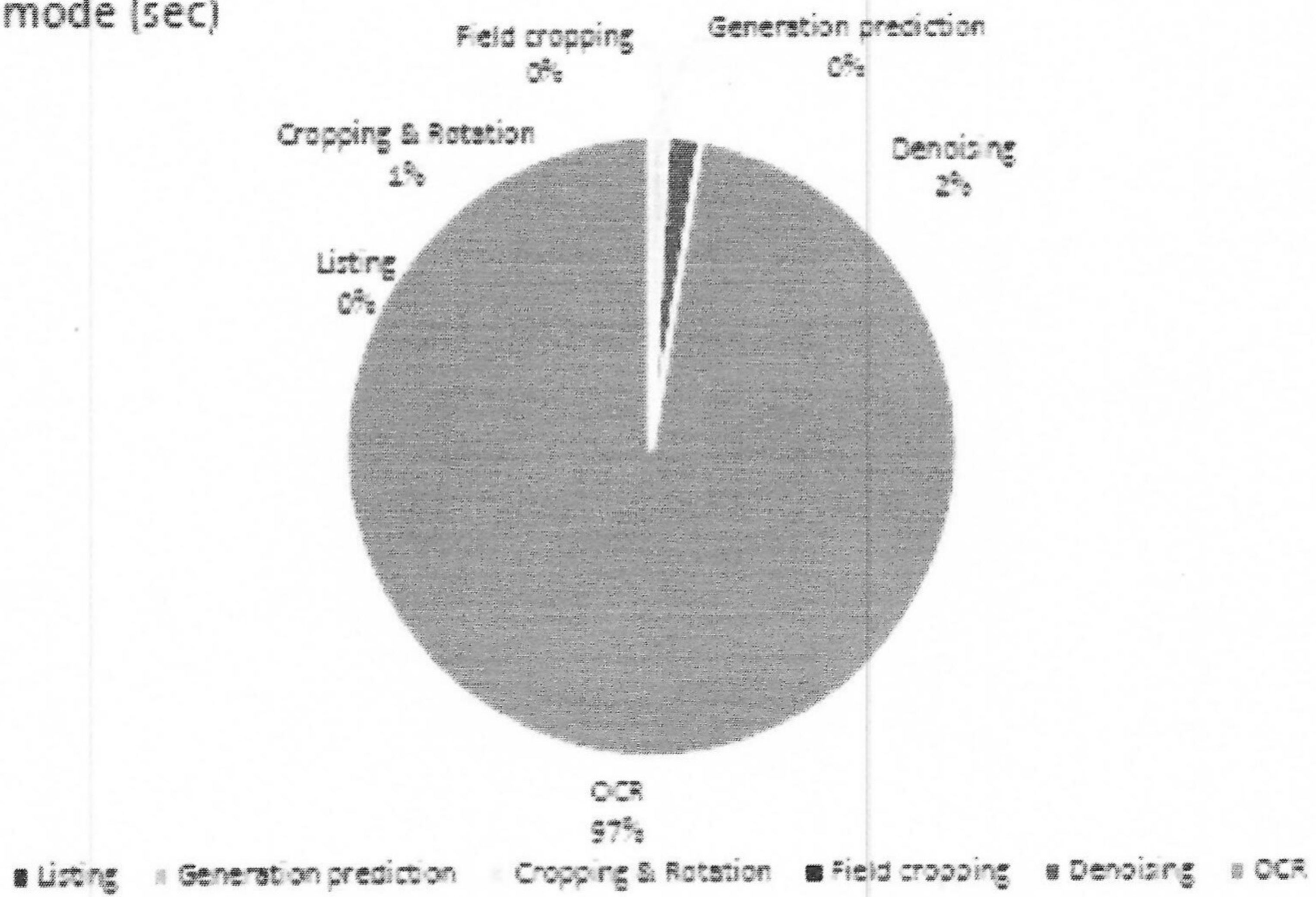


FIG. 18B

1850