



US00RE50542E

(19) **United States**
(12) **Reissued Patent**
Kim et al.

(10) **Patent Number:** **US RE50,542 E**
(45) **Date of Reissued Patent:** ***Aug. 19, 2025**

(54) **MOBILE TERMINAL HAVING TWO CAMERAS AND METHOD FOR STORING IMAGES TAKEN BY TWO CAMERAS**

(71) Applicant: **LG ELECTRONICS INC.**, Seoul (KR)

(72) Inventors: **Sungjin Kim**, Seoul (KR); **Yunmi Kwon**, Seoul (KR); **Kiseon Lee**, Seoul (KR); **Taehyeong Kim**, Seoul (KR)

(73) Assignee: **LG ELECTRONICS INC.**, Seoul (KR)

(*) Notice: This patent is subject to a terminal disclaimer.

(21) Appl. No.: **17/962,948**

(22) Filed: **Oct. 10, 2022**

Related U.S. Patent Documents

Reissue of:

(64) Patent No.: **10,091,429**
Issued: **Oct. 2, 2018**
Appl. No.: **15/662,172**
Filed: **Jul. 27, 2017**

U.S. Applications:

(63) Continuation of application No. 17/061,568, filed on Oct. 1, 2020, now Pat. No. Re. 49,245, which is an (Continued)

(30) **Foreign Application Priority Data**

Jul. 21, 2015 (KR) 10-2015-0103033
Jul. 22, 2015 (KR) 10-2015-0103755

(51) **Int. Cl.**
H04N 23/63 (2023.01)
G03B 37/04 (2021.01)
(Continued)

(52) **U.S. Cl.**
CPC **H04N 23/635** (2023.01); **G03B 37/04** (2013.01); **G06F 3/0412** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC G03B 2205/0046; G03B 37/04; G06F 3/0412; G06F 3/0416; G06F 3/0488;
(Continued)

(56) **References Cited**
U.S. PATENT DOCUMENTS
9,185,291 B1 11/2015 Shabtay et al.
10,091,429 B2 10/2018 Kim et al.
(Continued)

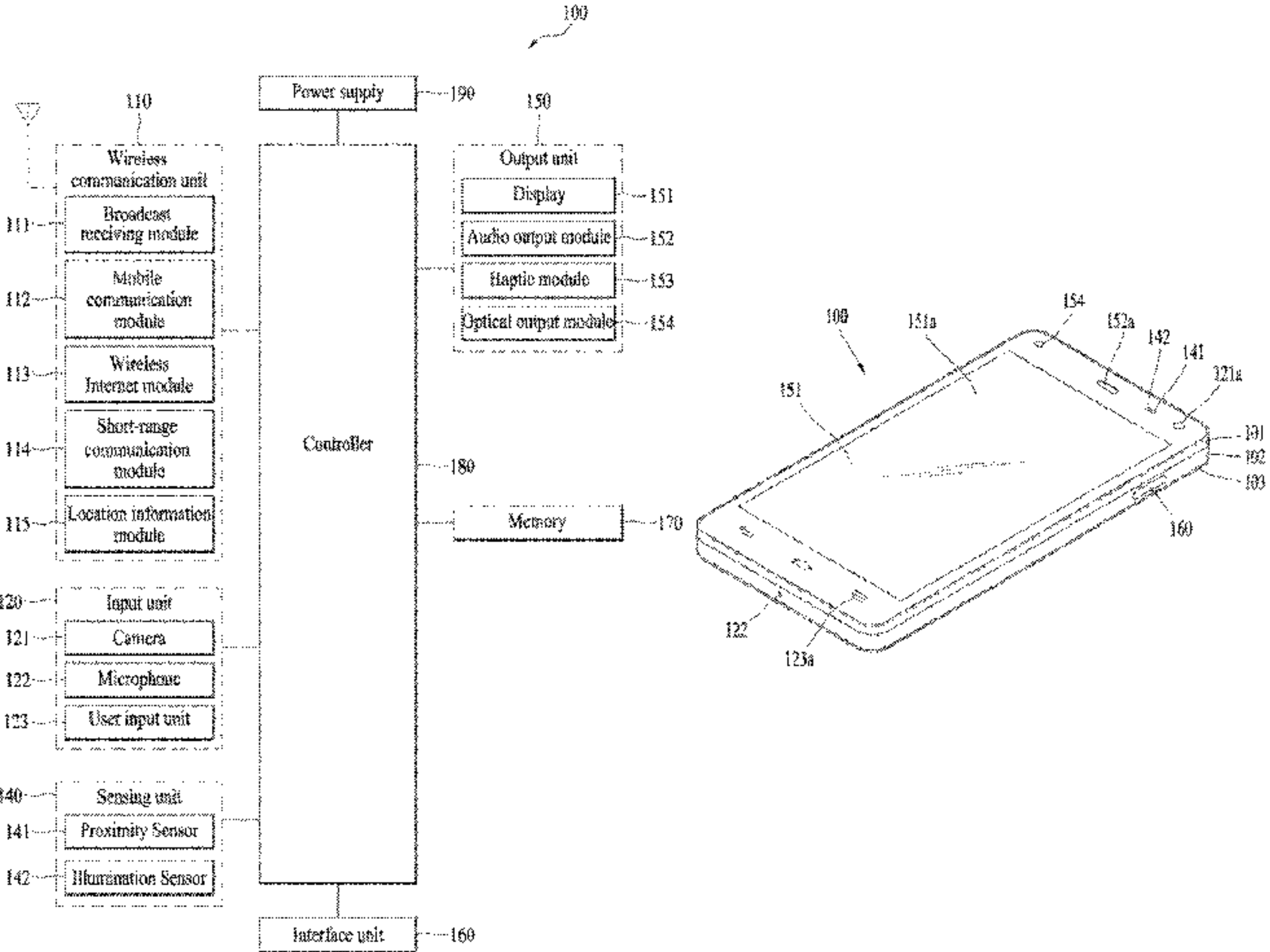
FOREIGN PATENT DOCUMENTS
EP 2747413 6/2014
JP 2001111976 4/2001
(Continued)

OTHER PUBLICATIONS

United States Patent and Trademark Office U.S. Appl. No. 15/662,172, Office Action dated Sep. 21, 2017, 23 pages.
(Continued)

Primary Examiner — Peng Ke
(74) *Attorney, Agent, or Firm* — LEE, HONG, DEGERMAN, KANG & WAIMEY

(57) **ABSTRACT**
A mobile terminal includes a memory; a touch screen; a first camera having a first capturing angle; a second camera having a second capturing angle that is wider than the first capturing angle; and a controller. The controller is configured to: cause the touch screen to display a first preview image of the first camera, a second preview image of the second camera, or both the first and second preview images overlapping each other; cause the memory to store a first image taken by the first camera in response to a first capture command received while the first preview image is displayed; and cause the memory to store both the first image and a second image taken by the second camera when a wide-angle capturing condition is satisfied while at least one
(Continued)



of the first preview image or the second preview image is displayed.

21 Claims, 23 Drawing Sheets

Related U.S. Application Data

application for the reissue of Pat. No. 10,091,429, which is a continuation of application No. 14/868,218, filed on Sep. 28, 2015, now Pat. No. 9,749,543.

- (51) Int. Cl.
G06F 3/041 (2006.01)
G06F 3/0488 (2022.01)
H04M 1/02 (2006.01)
H04N 13/161 (2018.01)
H04N 13/239 (2018.01)
H04N 23/45 (2023.01)
H04N 23/61 (2023.01)
H04N 23/611 (2023.01)
H04N 23/62 (2023.01)
H04N 23/667 (2023.01)
H04N 23/69 (2023.01)
- (52) U.S. Cl.
CPC G06F 3/0416 (2013.01); G06F 3/0488 (2013.01); H04M 1/0264 (2013.01); H04N 13/161 (2018.05); H04N 13/239 (2018.05); H04N 23/45 (2023.01); H04N 23/611 (2023.01); H04N 23/62 (2023.01); H04N 23/632 (2023.01); H04N 23/667 (2023.01); H04N 23/69 (2023.01); G03B 2205/0046 (2013.01); H04N 23/61 (2023.01)
- (58) Field of Classification Search
CPC . H04M 1/0264; H04N 13/161; H04N 13/239; H04N 23/45; H04N 23/61; H04N 23/611; H04N 23/62; H04N 23/632; H04N 23/635; H04N 23/667; H04N 23/69
See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

10,777,075	B2 *	9/2020	Carlsson	G07B 15/063
RE49,245	E	10/2022	Kim et al.	
2007/0146503	A1 *	6/2007	Shiraki	H04N 3/1593
				348/231.3
2007/0285550	A1 *	12/2007	Son	H04N 5/232
				348/335
2008/0030592	A1	2/2008	Border et al.	
2011/0164105	A1	7/2011	Lee et al.	
2012/0038747	A1	2/2012	Kim et al.	
2013/0162782	A1	6/2013	Kuo et al.	
2013/0321340	A1 *	12/2013	Seo	G06F 3/0486
				345/174
2015/0015741	A1	1/2015	Kim et al.	
2015/0077580	A1 *	3/2015	Kim	H04N 23/698
				348/211.1
2015/0085083	A1	3/2015	Chen et al.	
2015/0163400	A1	6/2015	Geiss et al.	
2015/0207970	A1	7/2015	Min et al.	
2017/0026582	A1	1/2017	Kim et al.	
2017/0347035	A1	11/2017	Kim et al.	

FOREIGN PATENT DOCUMENTS

JP	2001111976	A	4/2001
JP	2005101874		4/2005
JP	2005101874	A	4/2005
JP	2011229116		11/2011
JP	2011229116	A	11/2011
KR	20100050759		5/2010
KR	20110059286		6/2011
KR	20120021762		3/2012
KR	20150022350		3/2015

OTHER PUBLICATIONS

United States Patent and Trademark Office U.S. Appl. No. 17/061,569, Office Action dated Jan. 14, 2022, 20 pages.
Korean Intellectual Property Office Application No. 10-2015-0103755, Notice of Allowance dated Feb. 3, 2017, 1 pages.
European Patent Application No. 16158524.5, Search Report dated Nov. 25, 2016, 9 pages.
Korean Intellectual Property Office Application No. 10-2015-0103033, Notice of Allowance dated May 19, 2016, 3 pages.

* cited by examiner

FIG. 1A

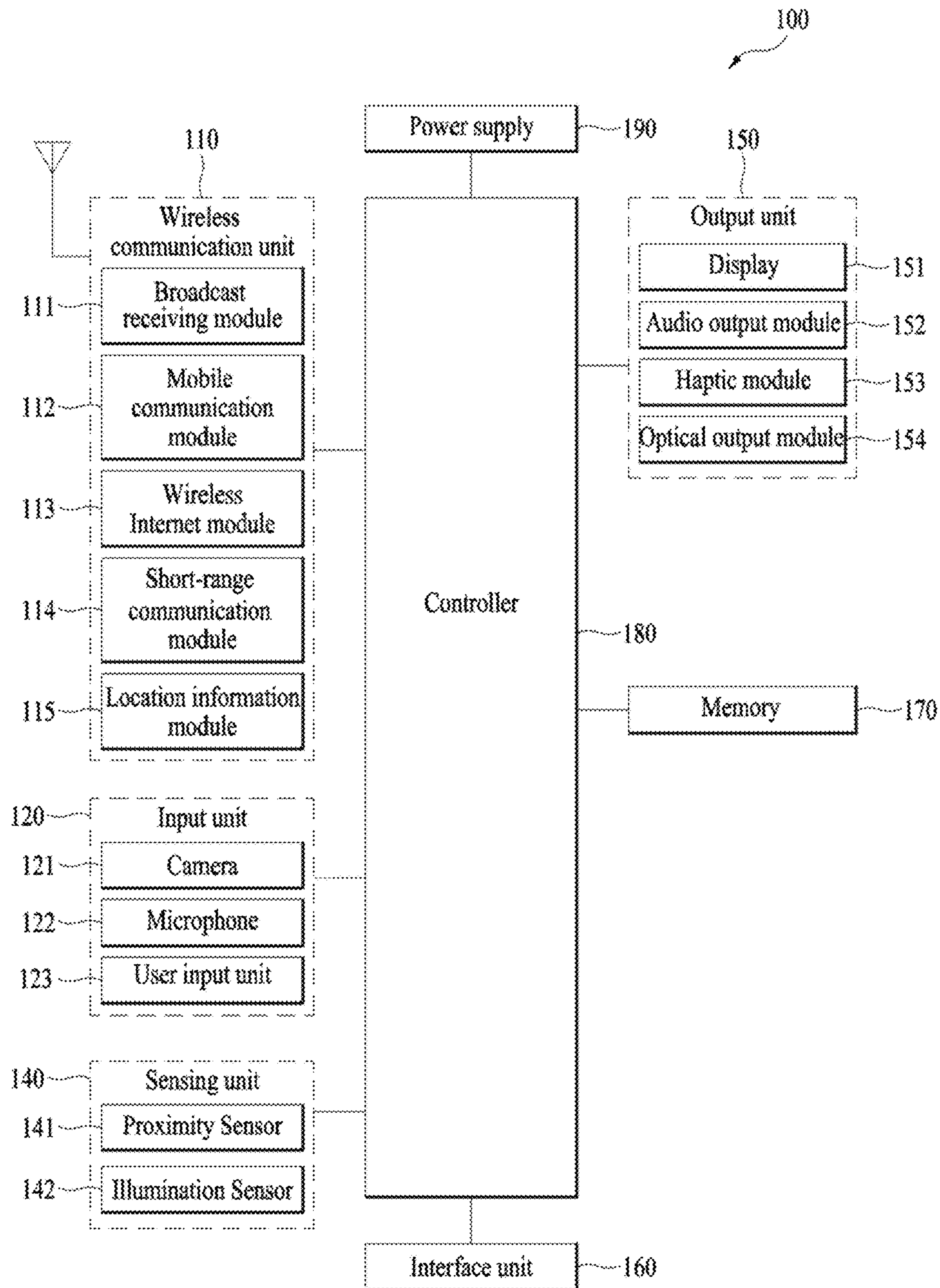


FIG. 1B

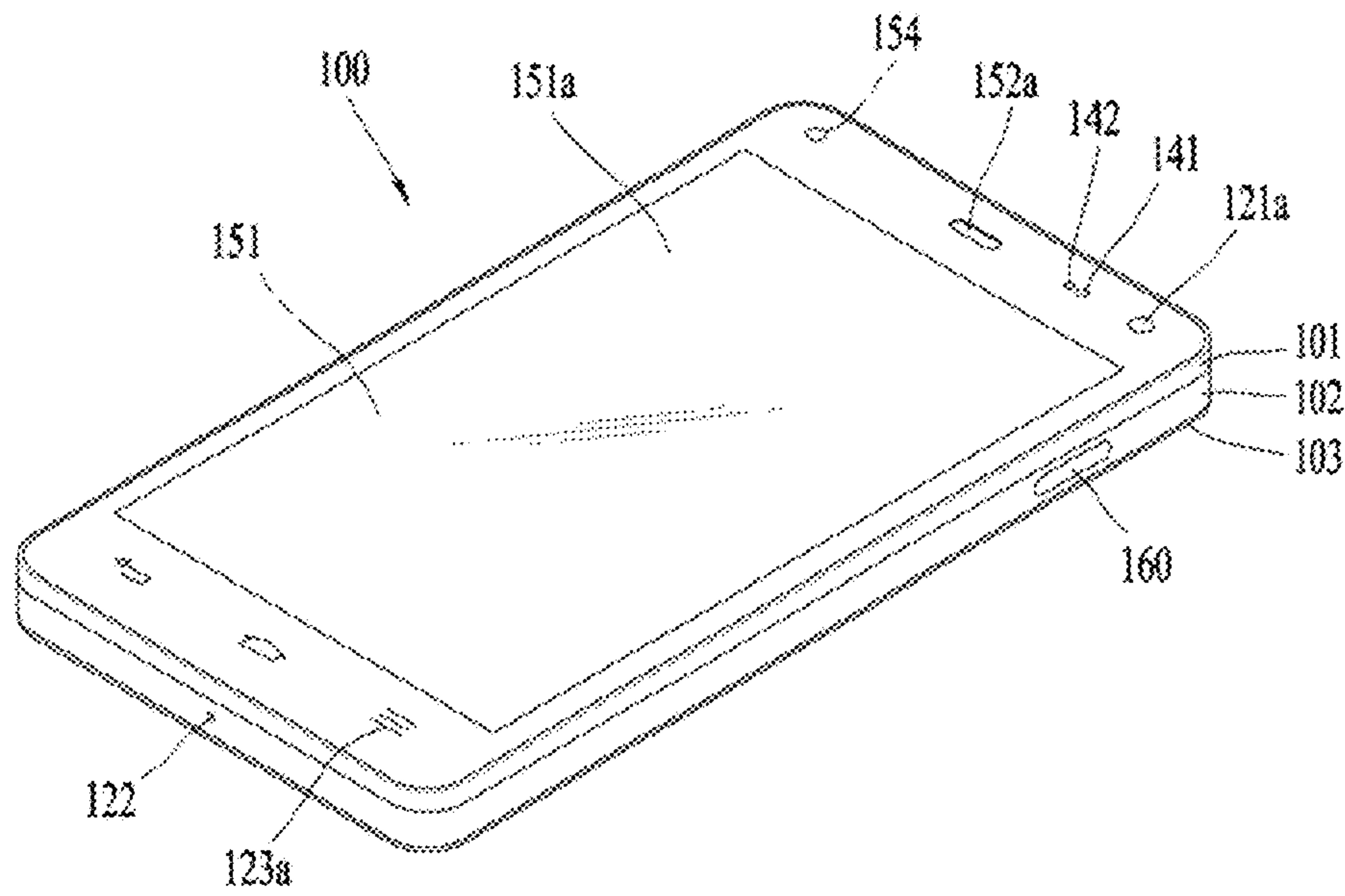


FIG. 1C

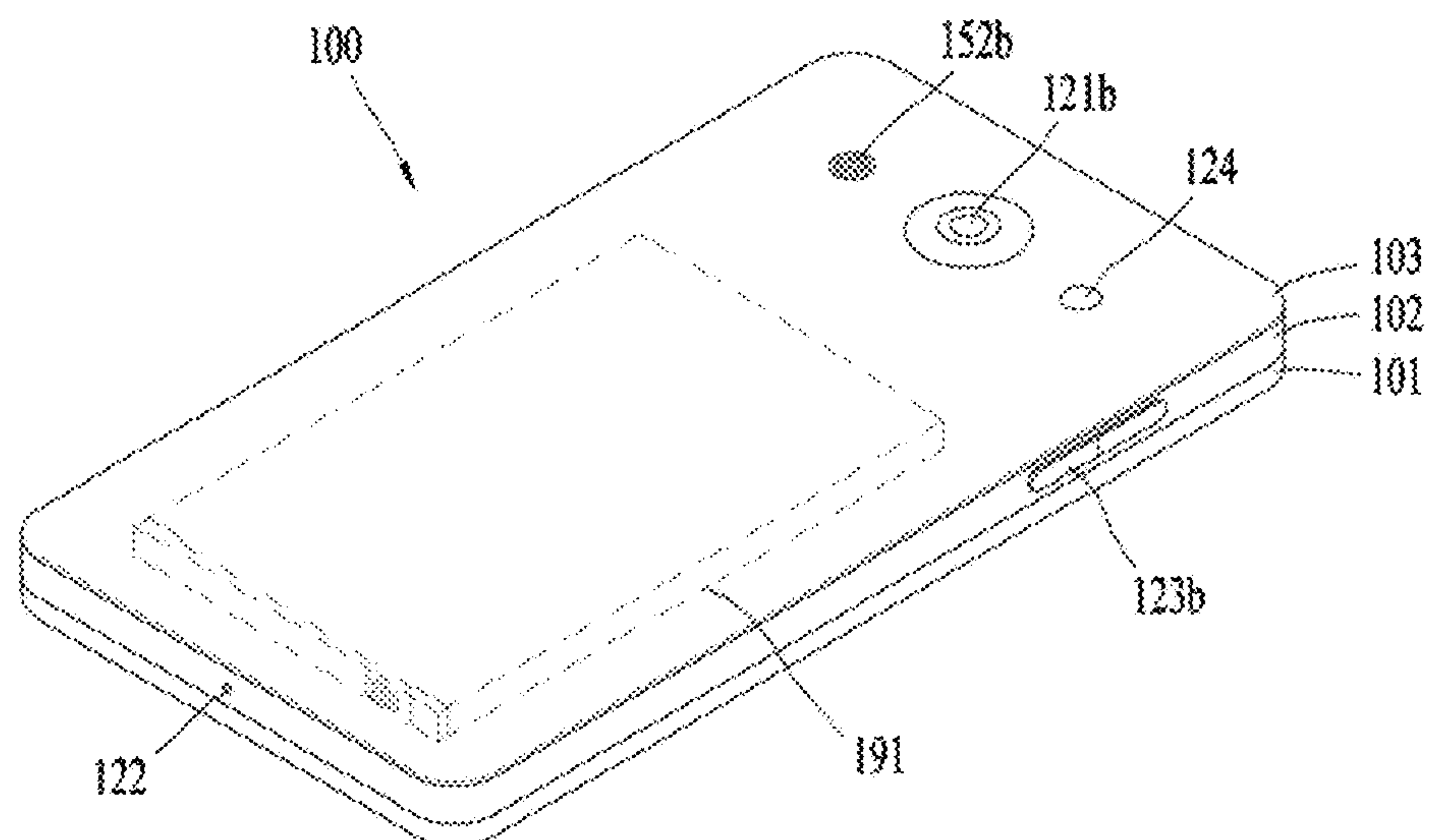


FIG. 2

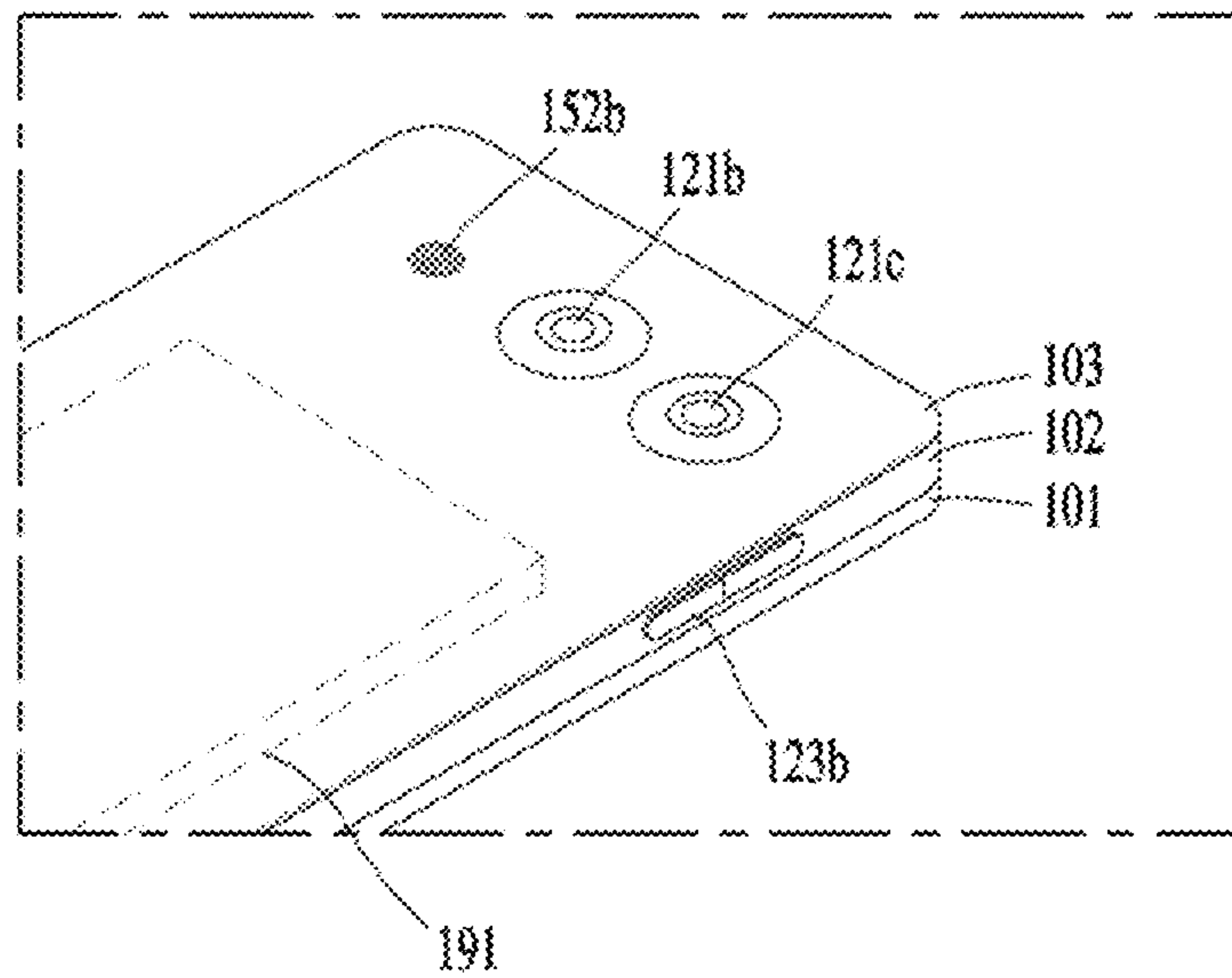


FIG. 3A

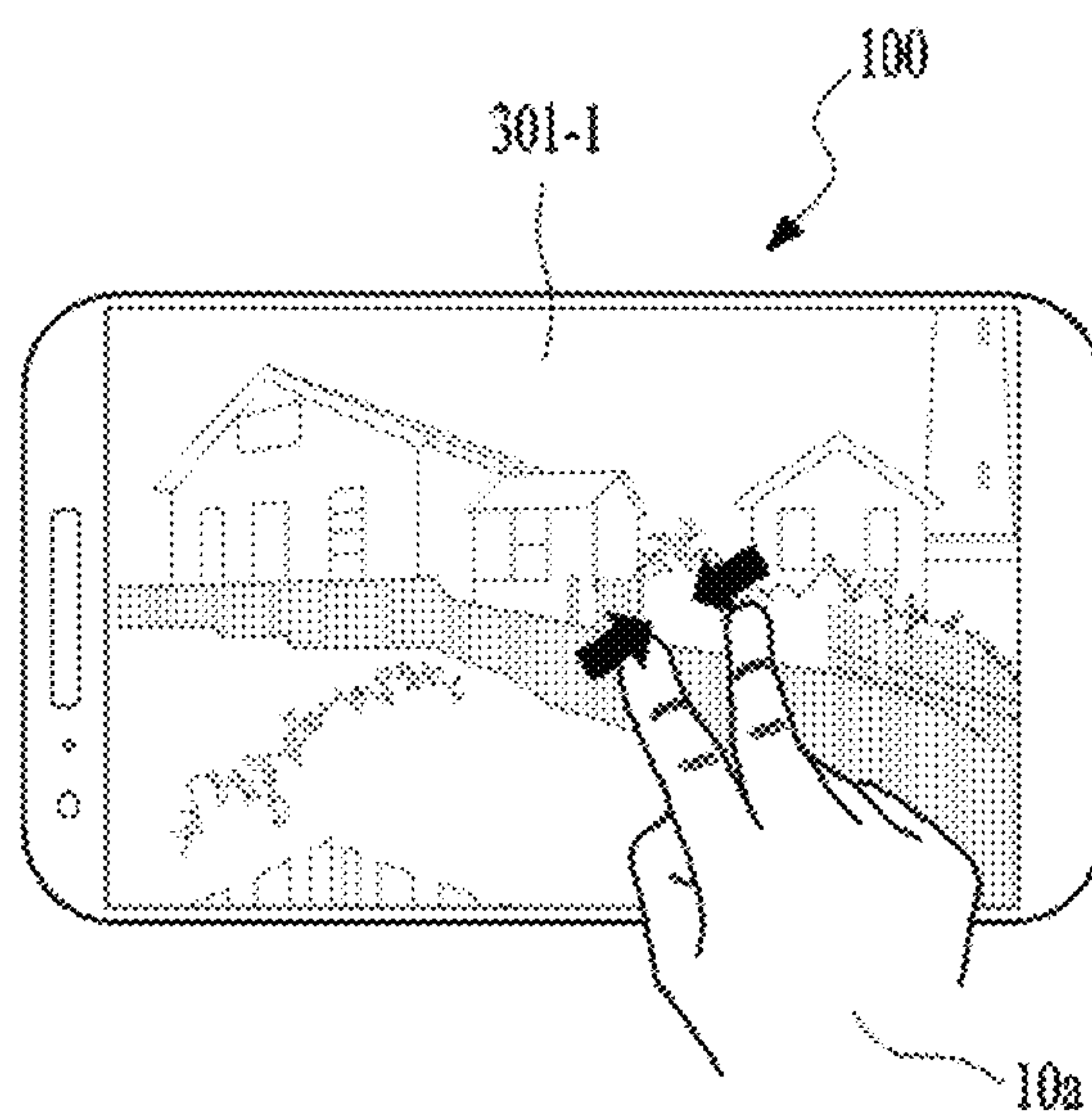


FIG. 3B

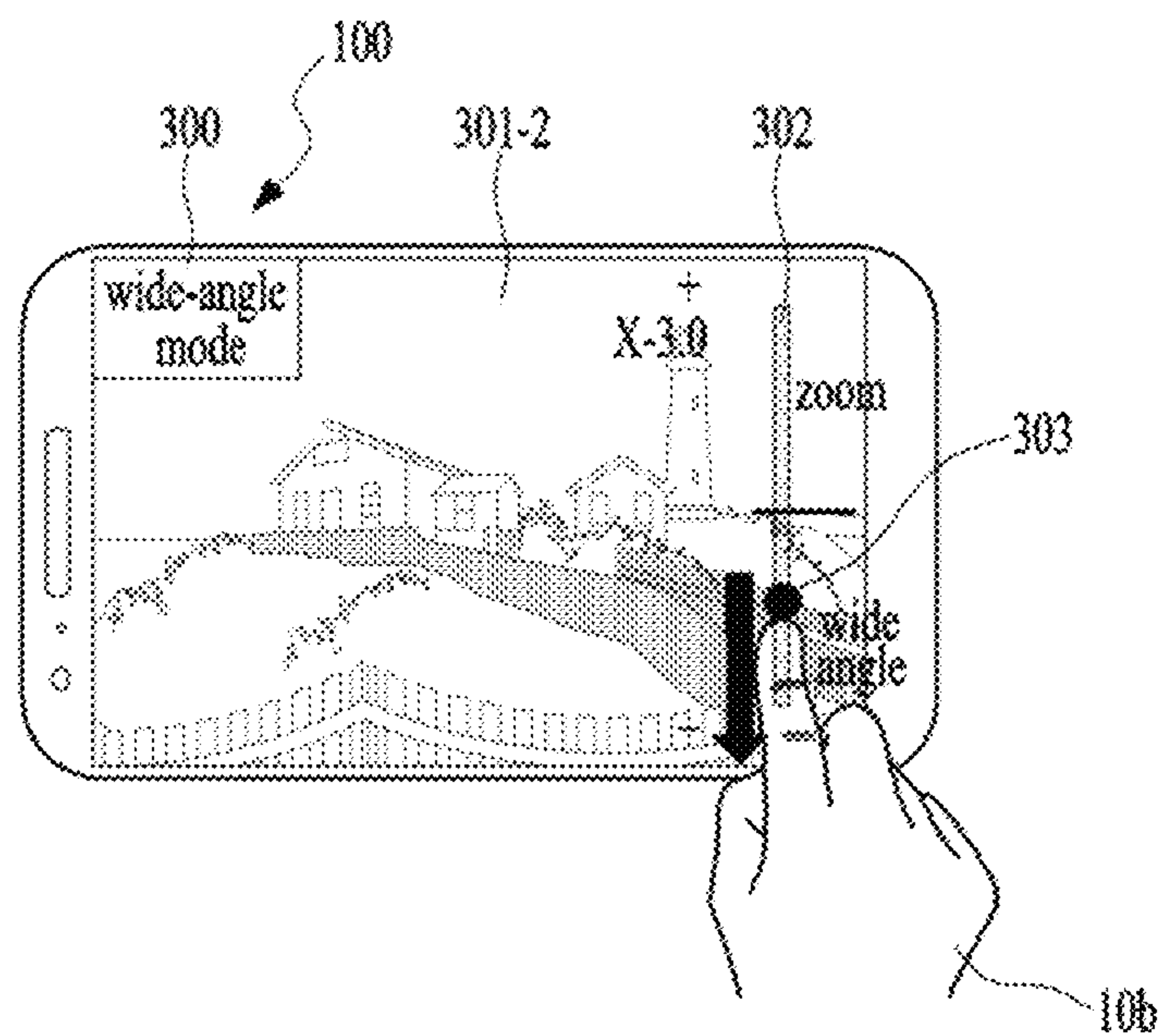


FIG. 3C

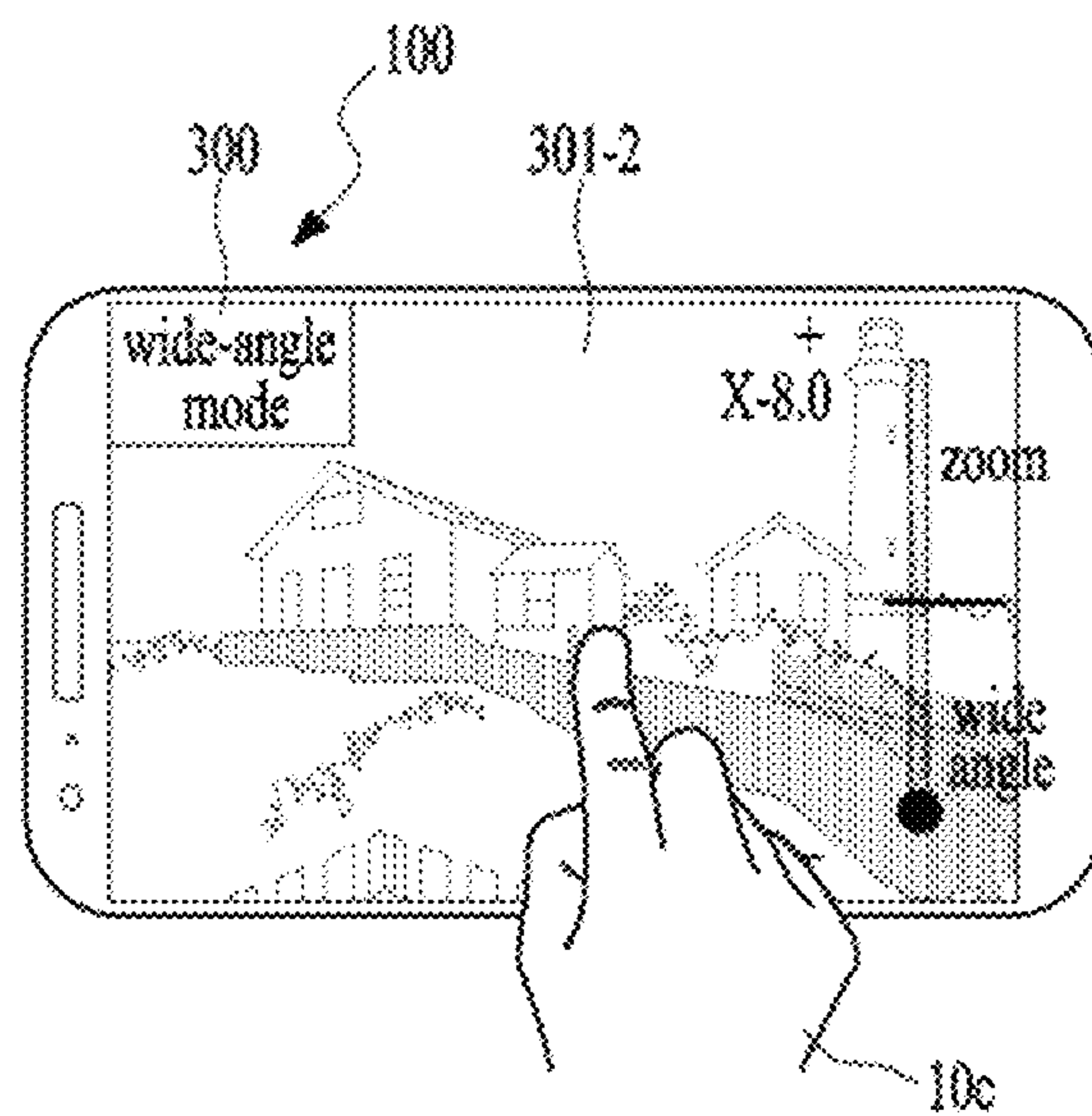


FIG. 4A

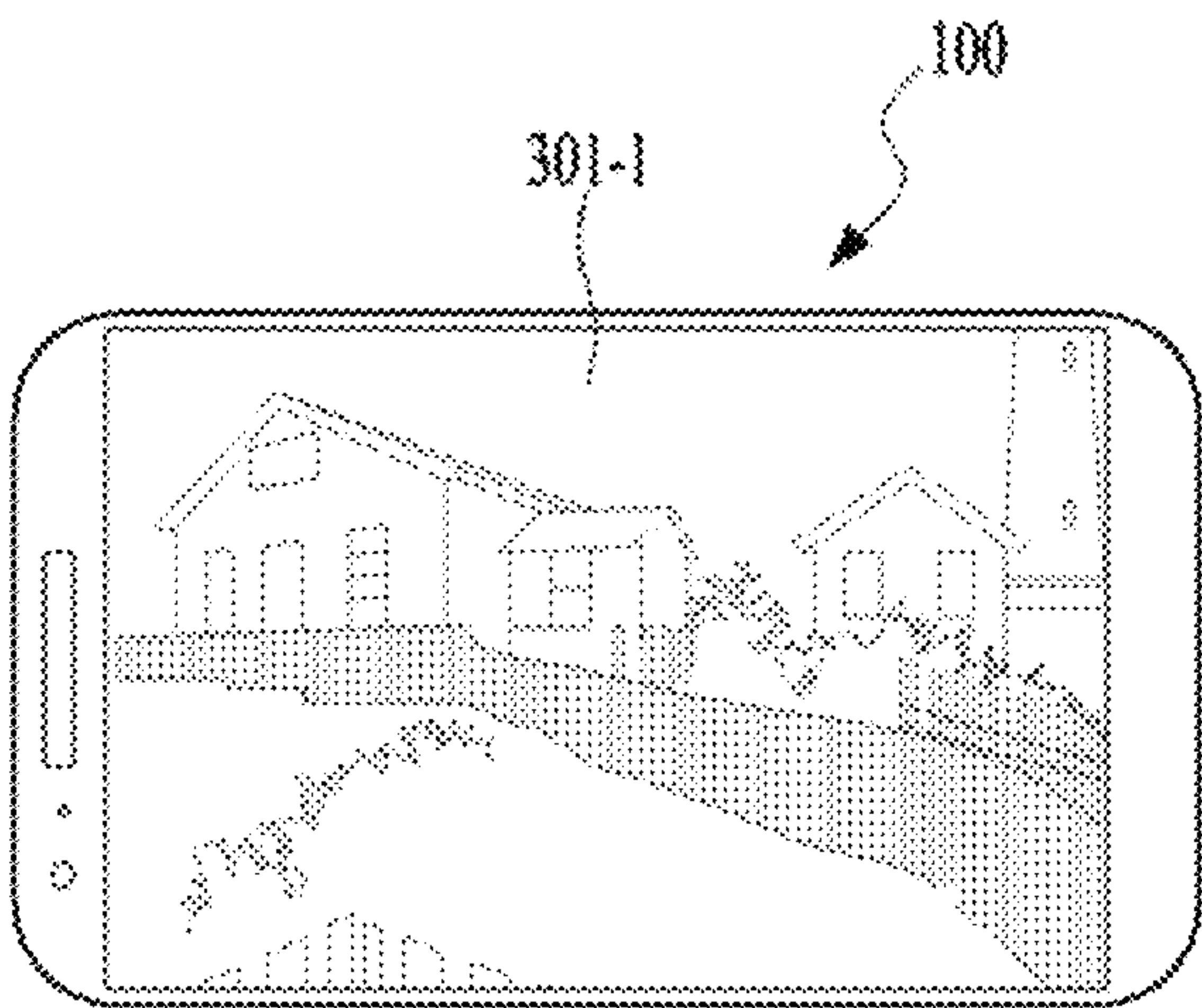


FIG. 4B

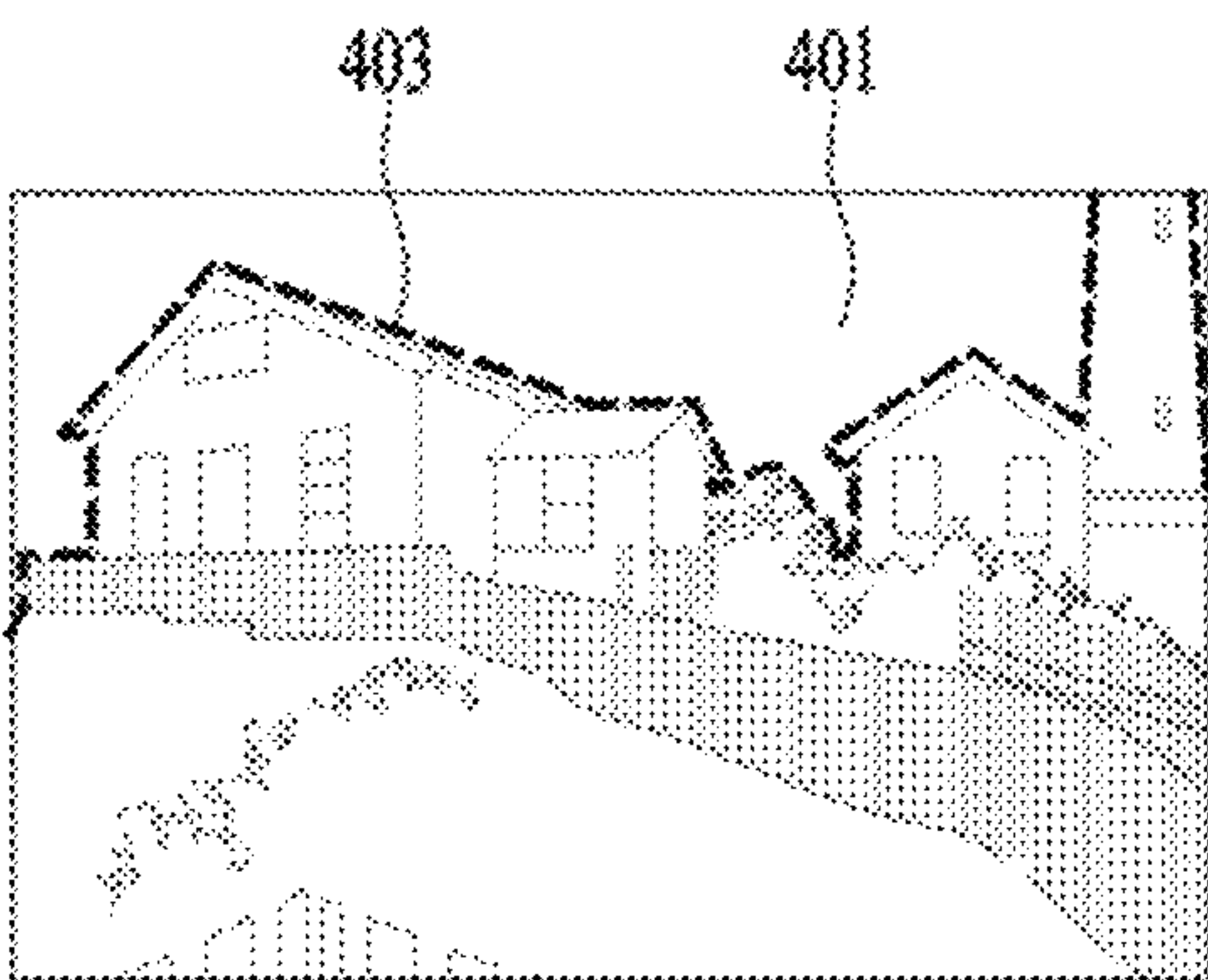


FIG. 4C

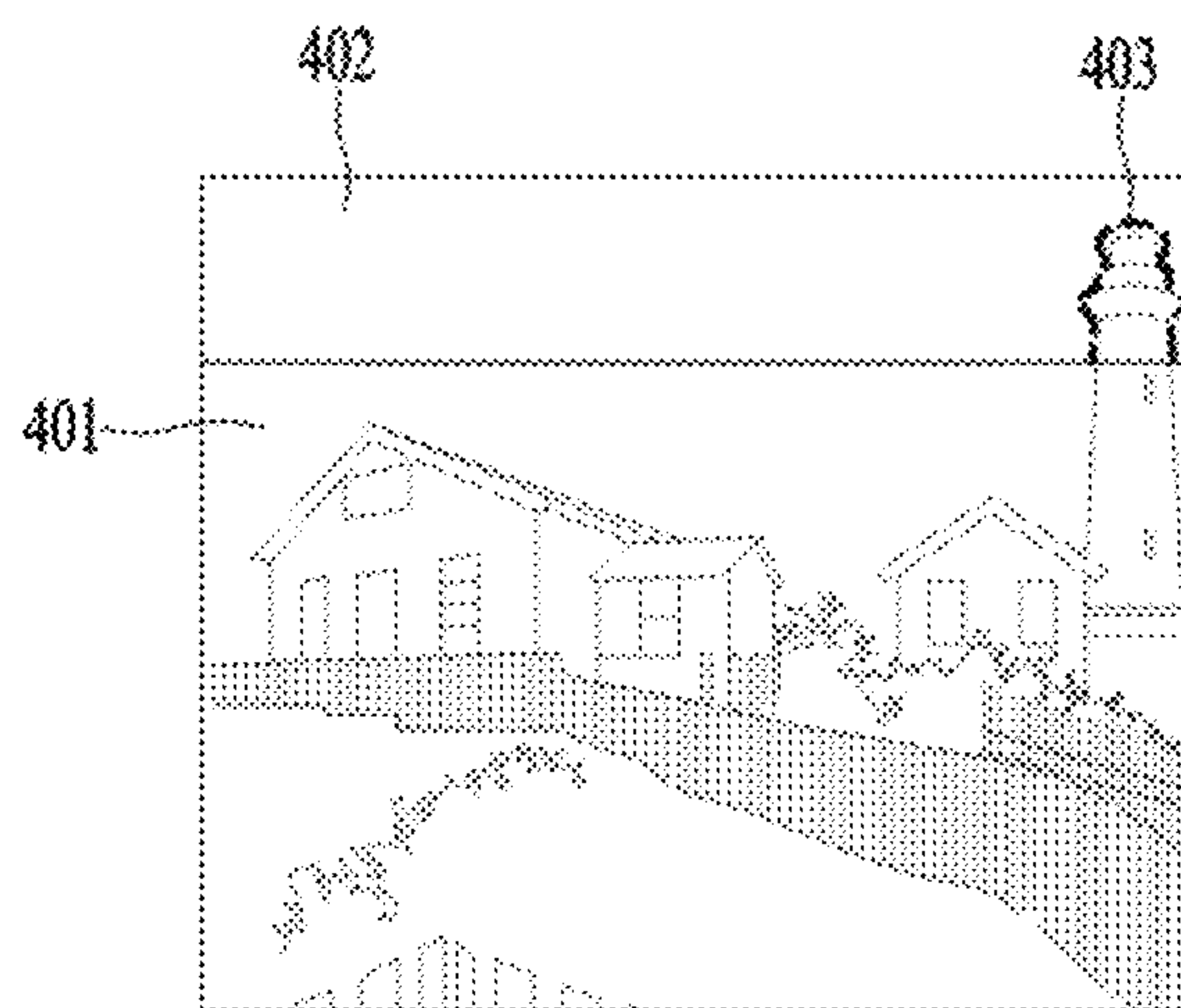


FIG. 5A

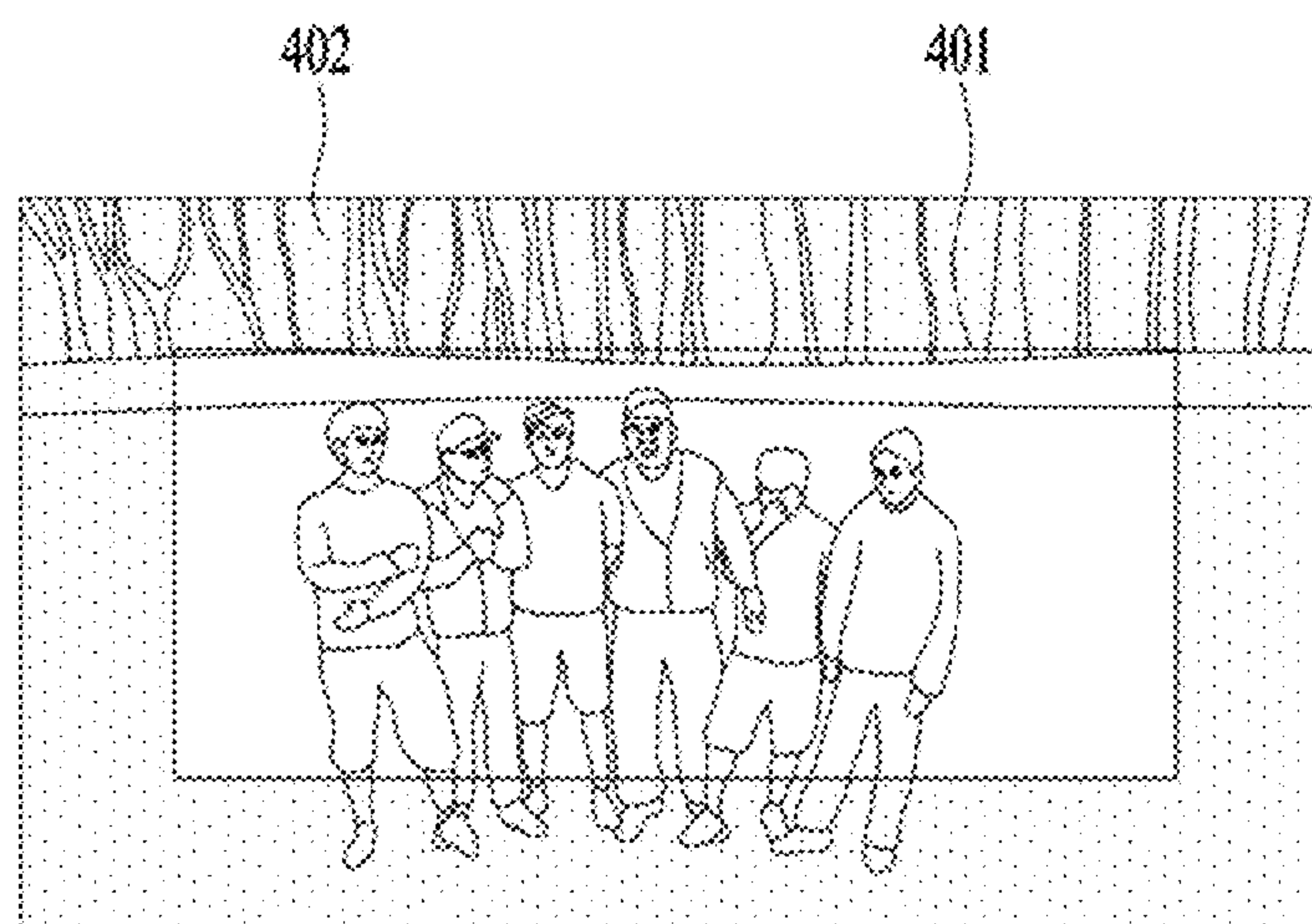


FIG. 5B

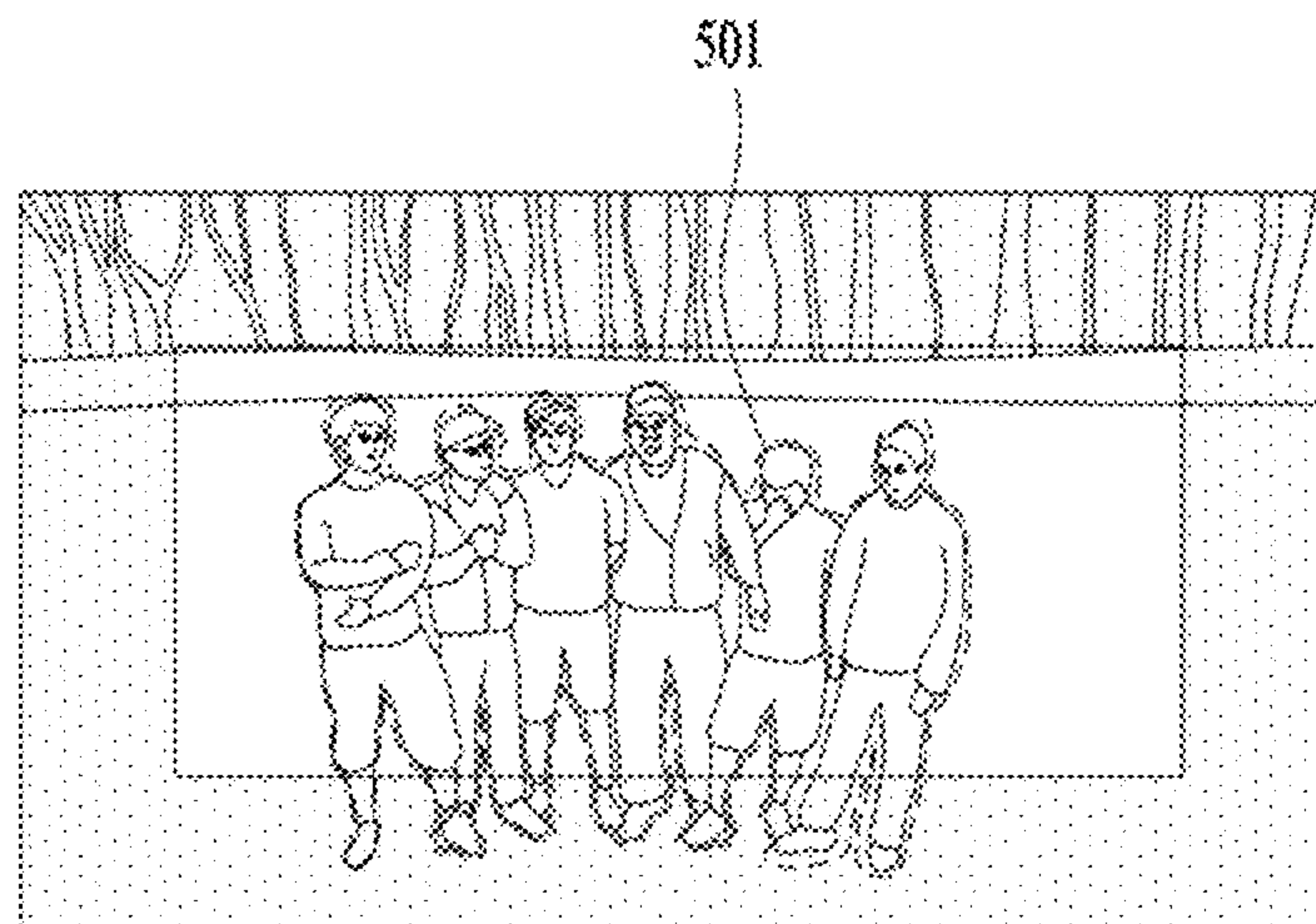


FIG. 6A

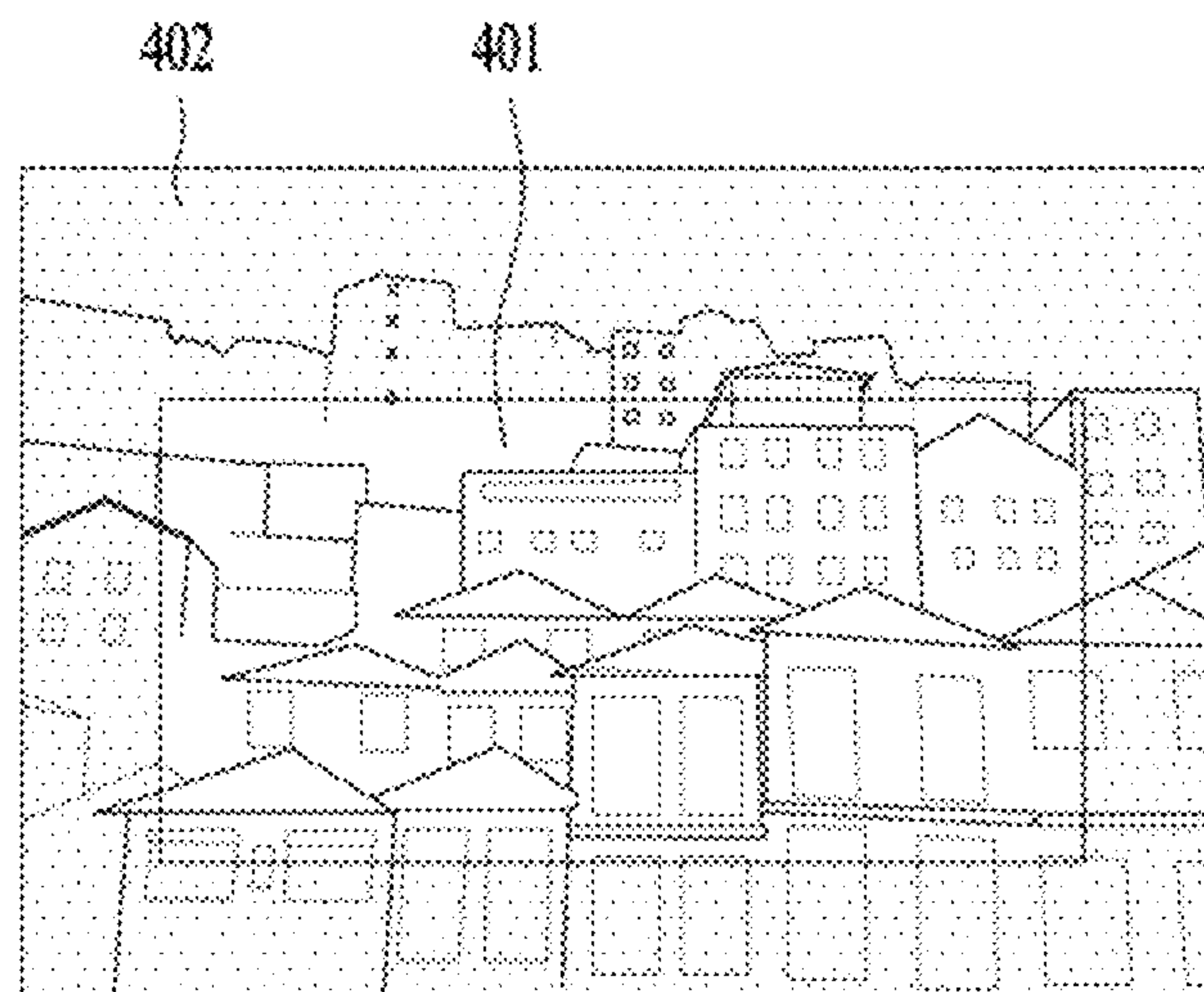


FIG. 6B

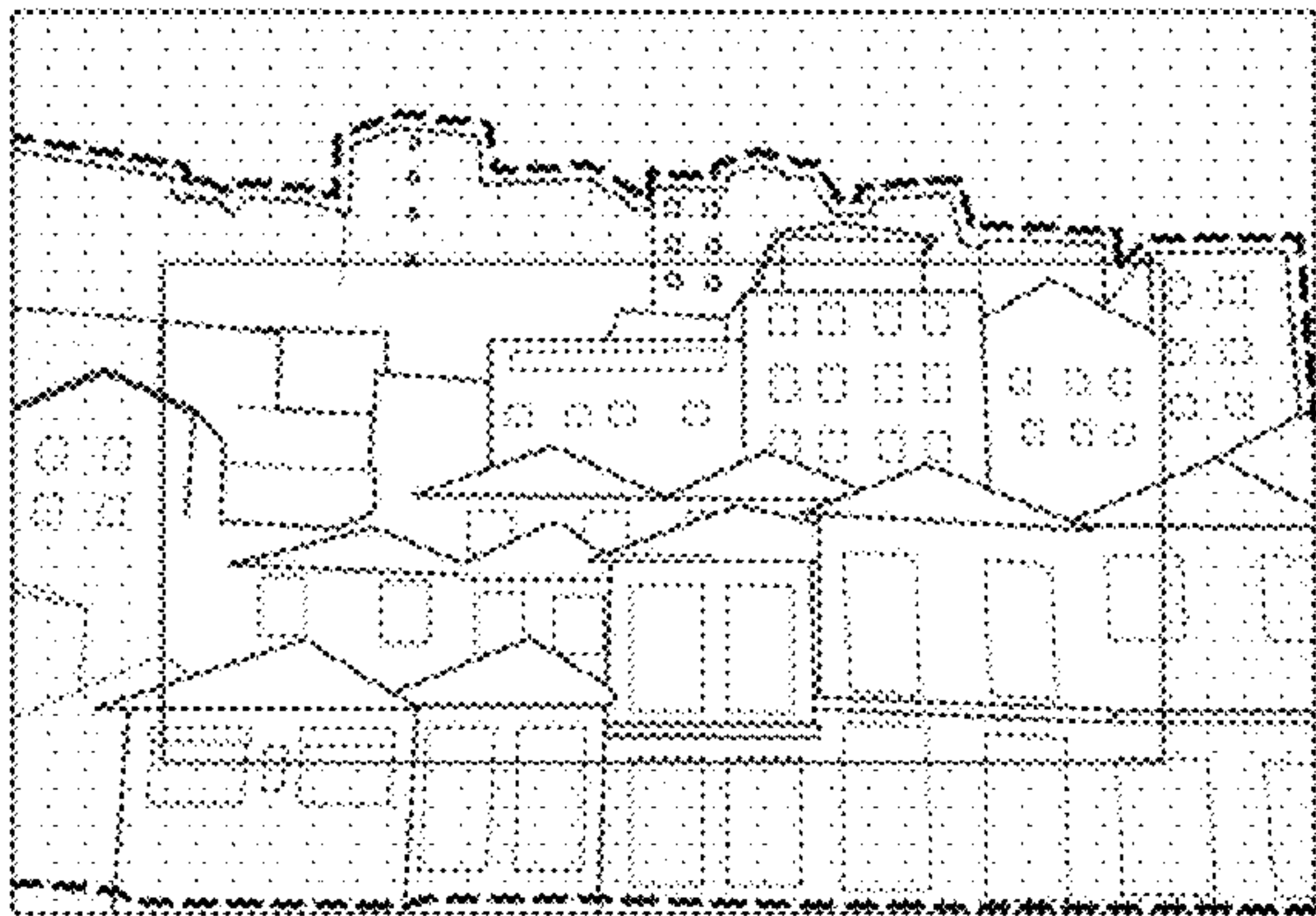


FIG. 7

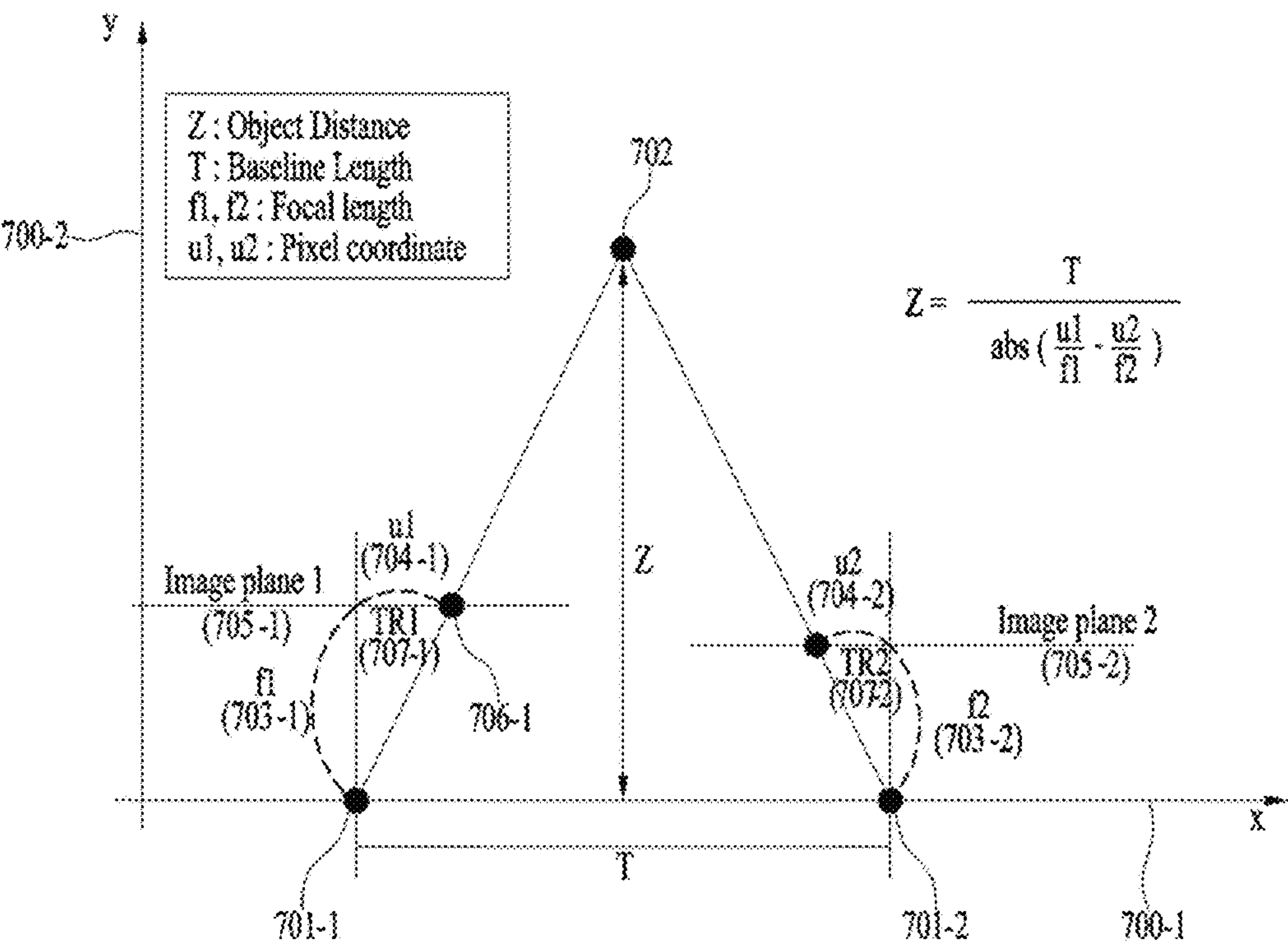


FIG. 8

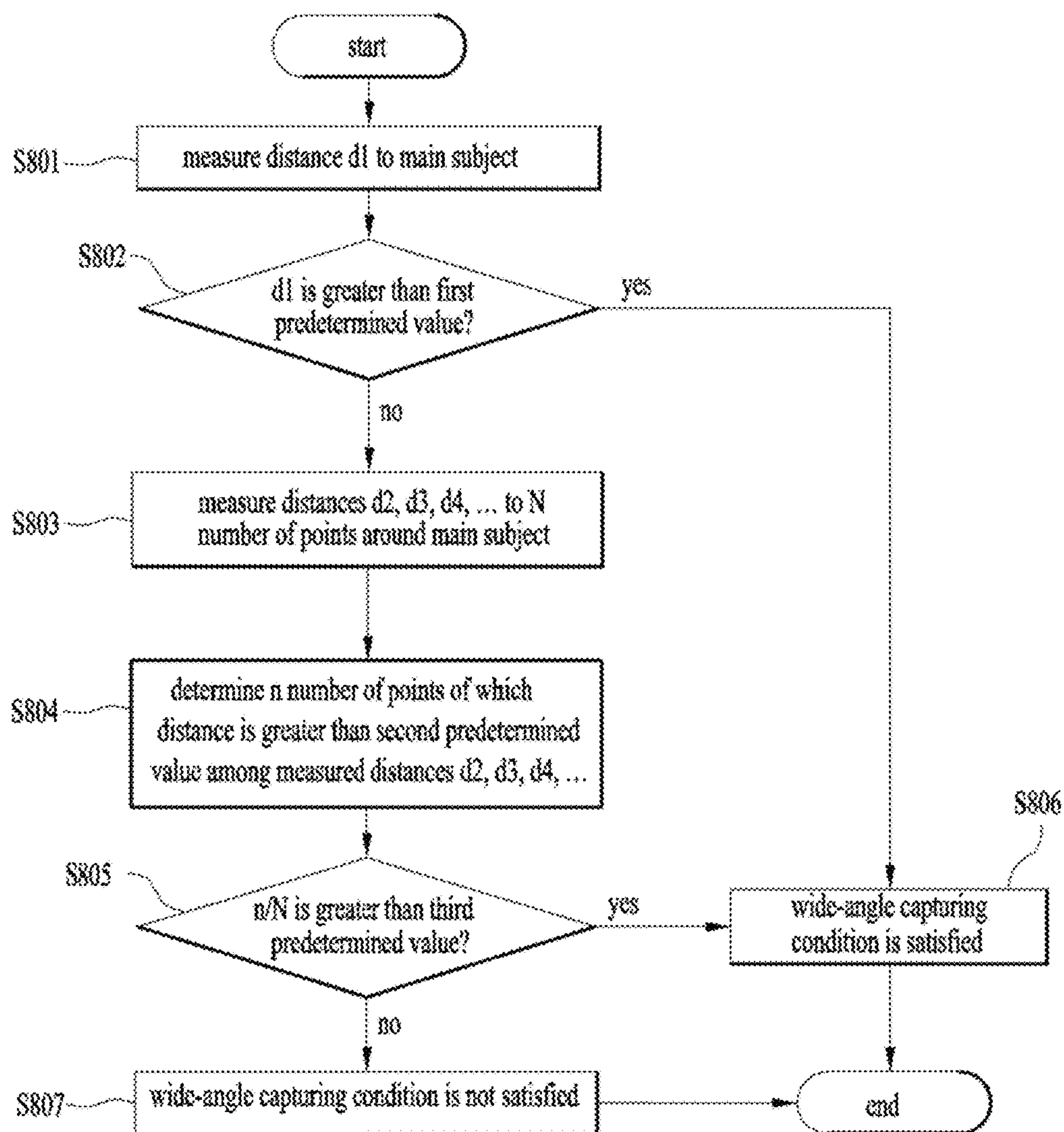


FIG. 9A

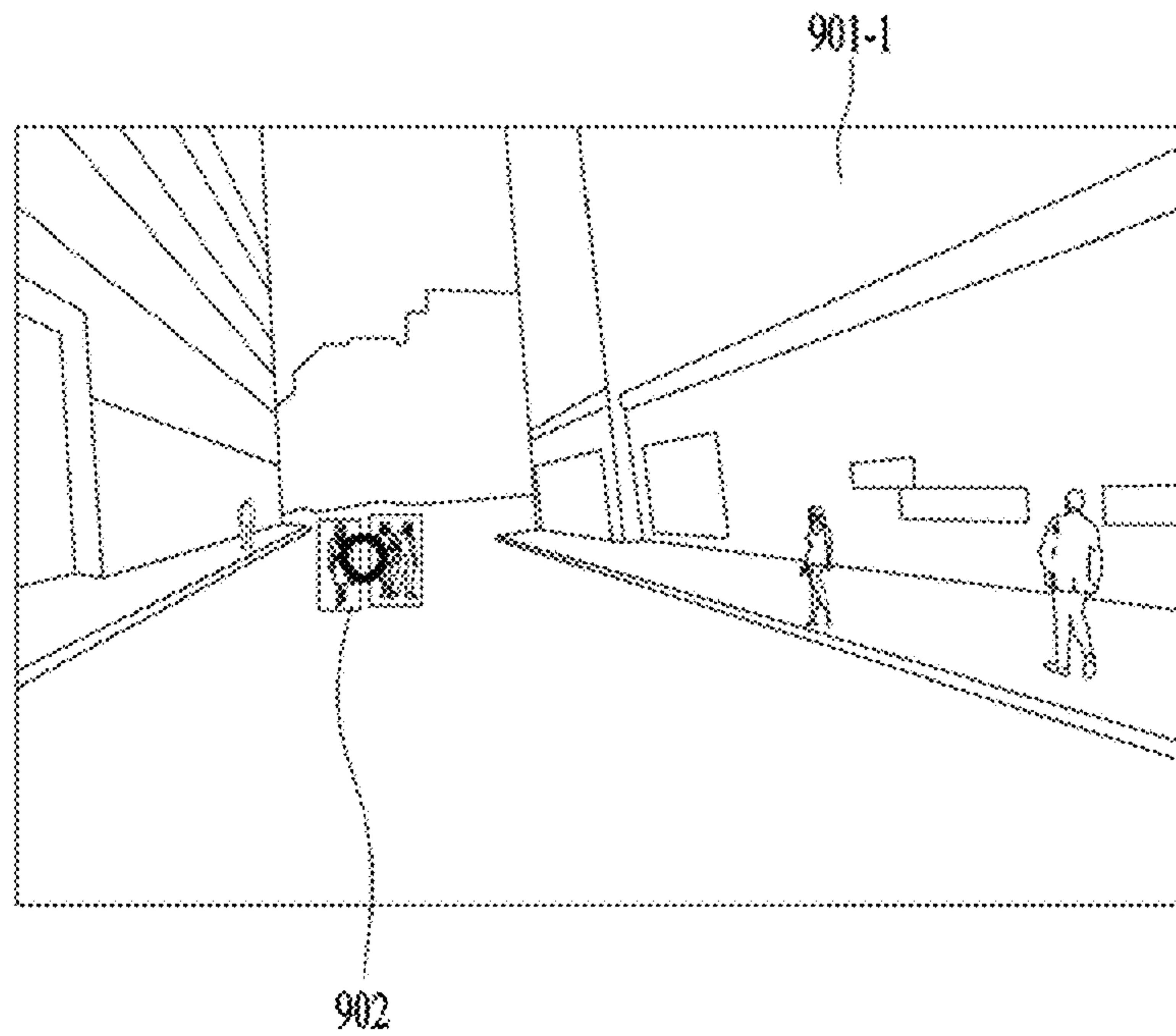


FIG. 9B

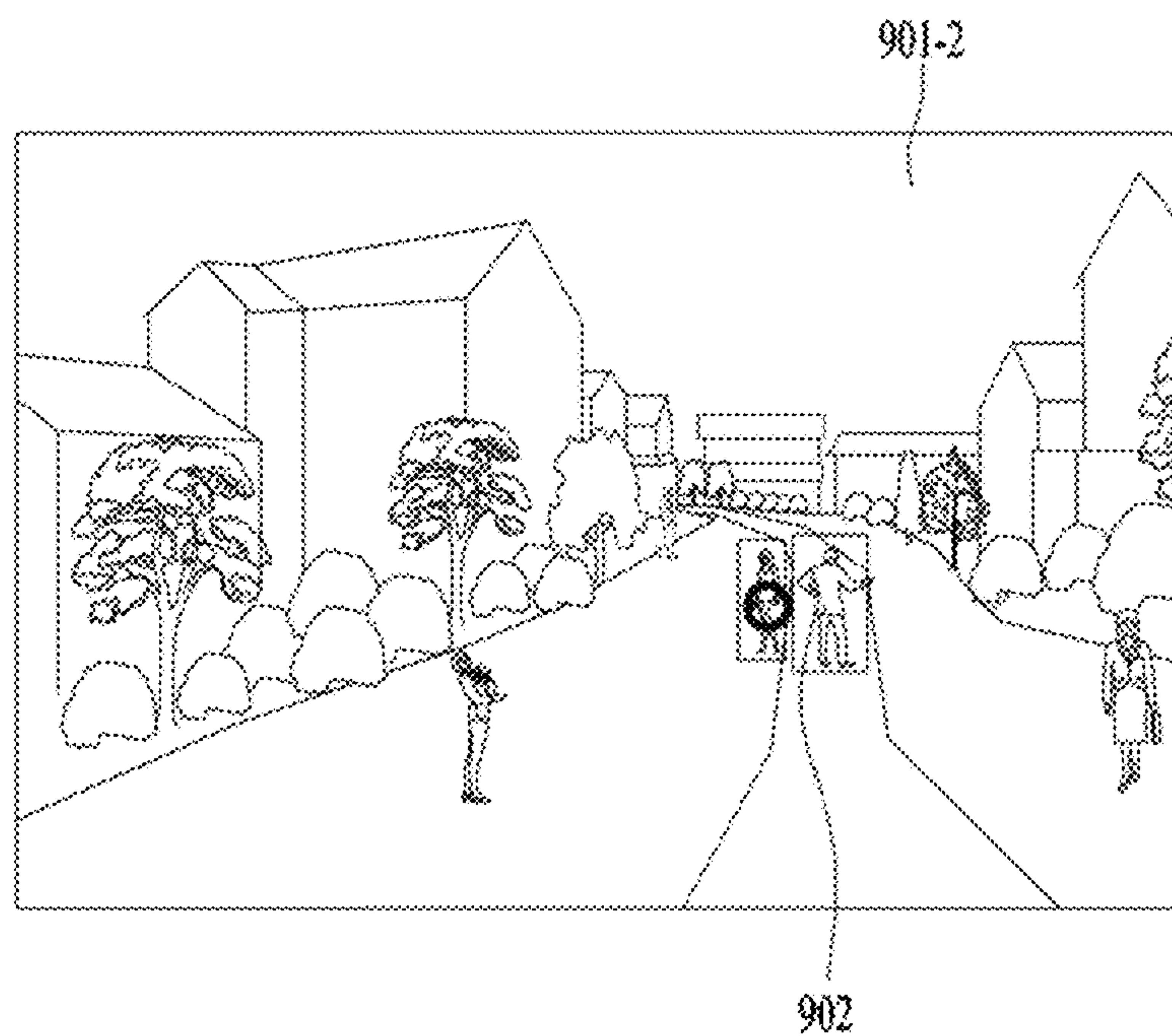


FIG. 10A

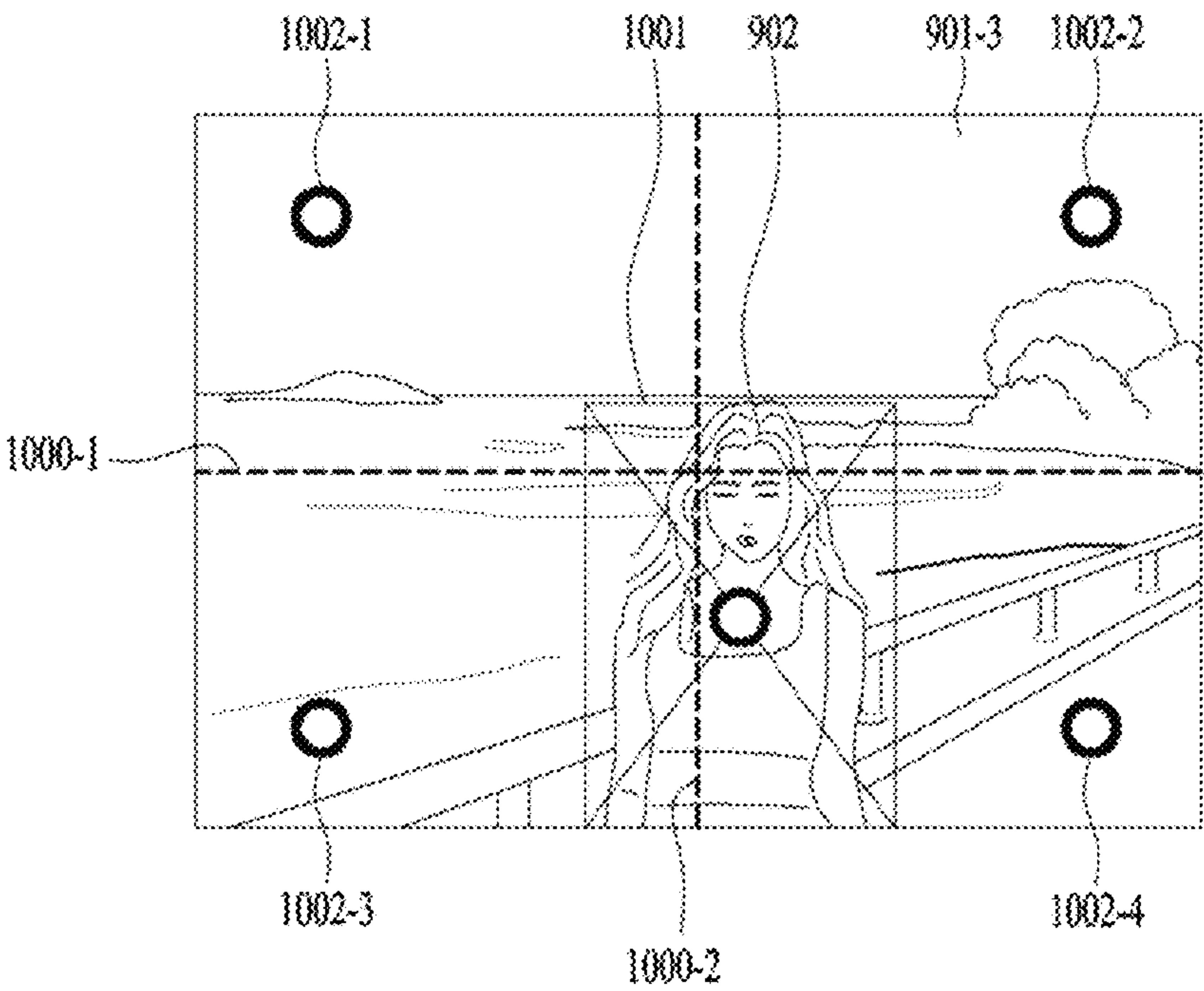


FIG. 10B

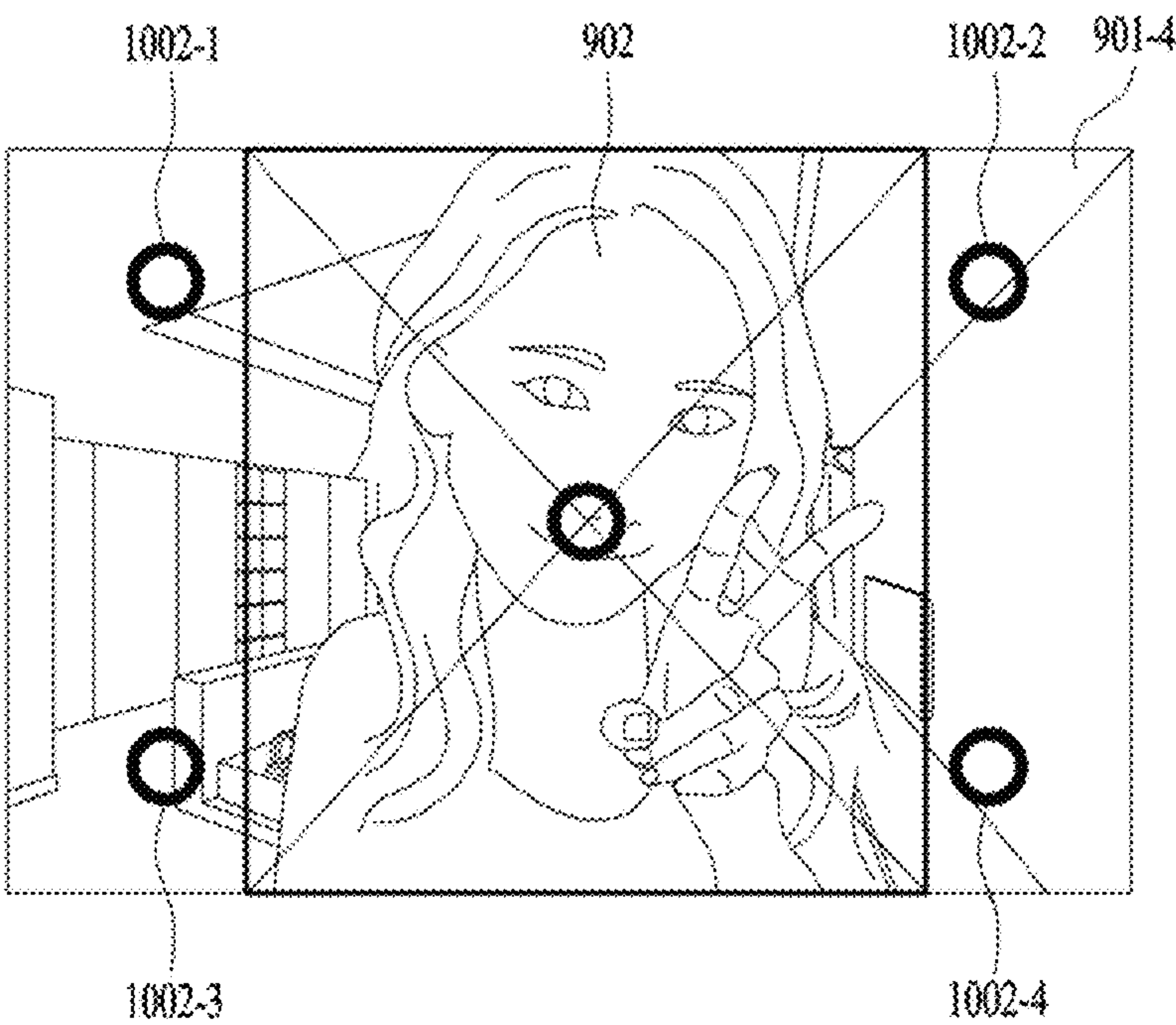


FIG. 11A

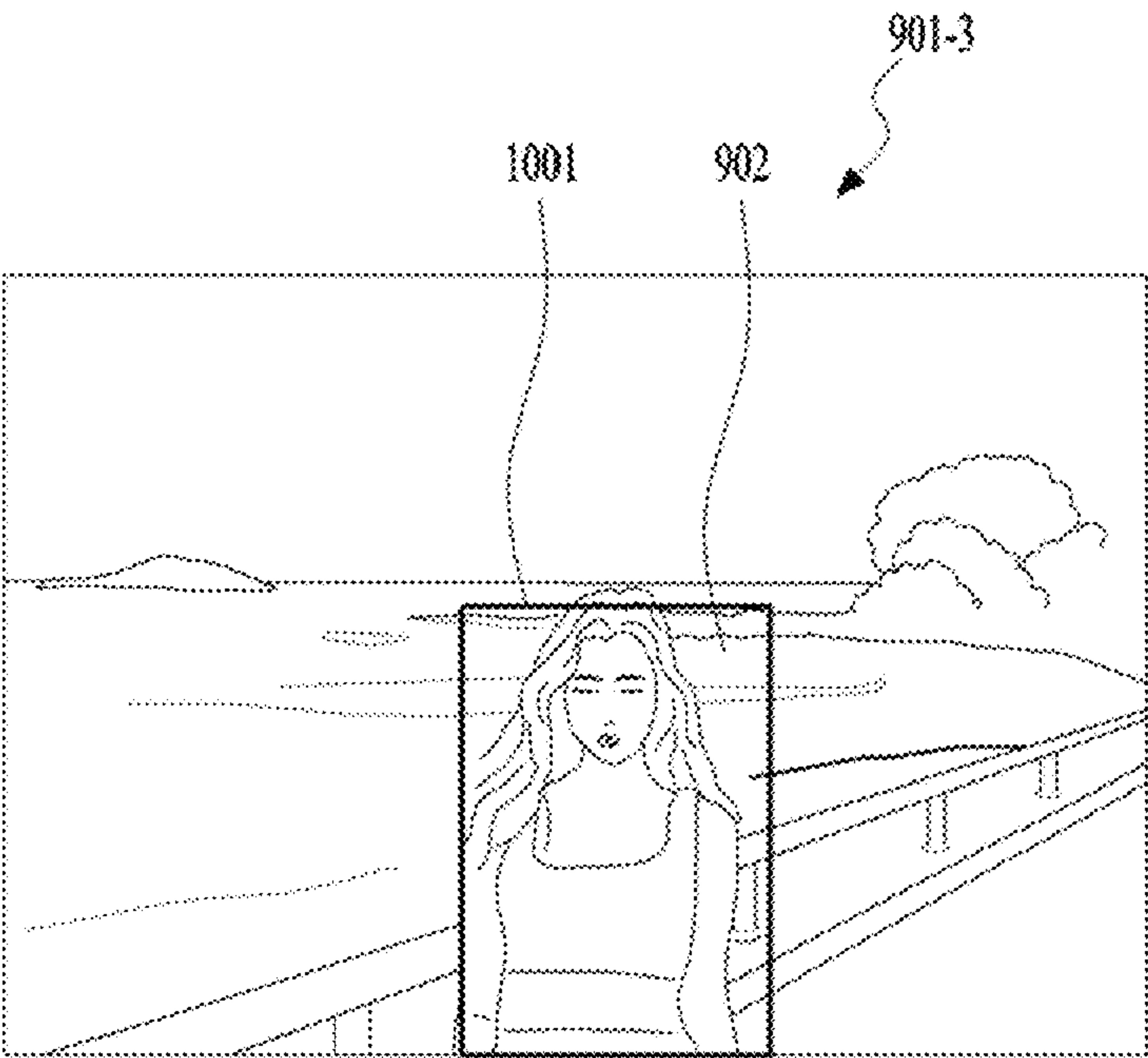


FIG. 11B

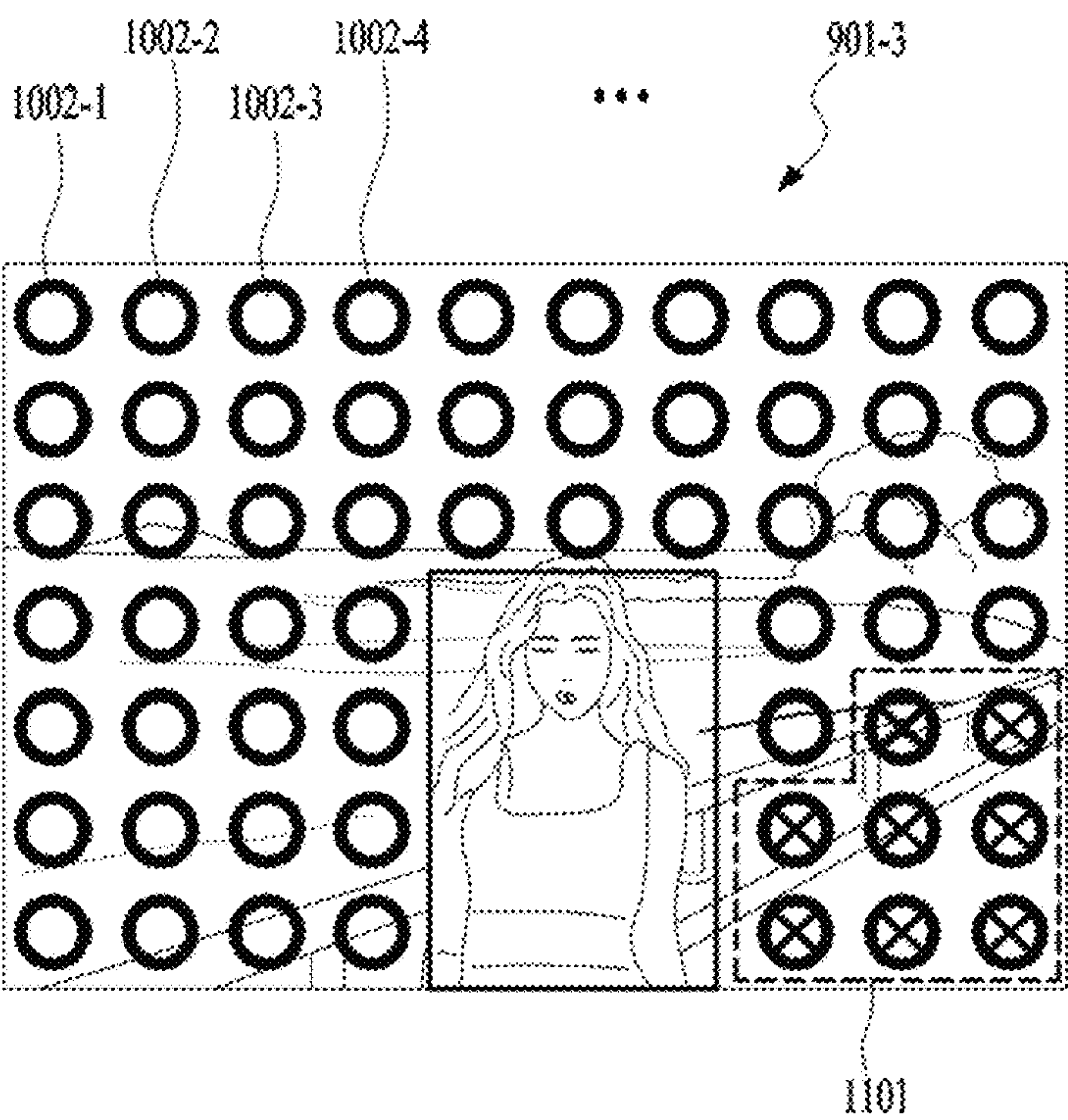


FIG. 12A

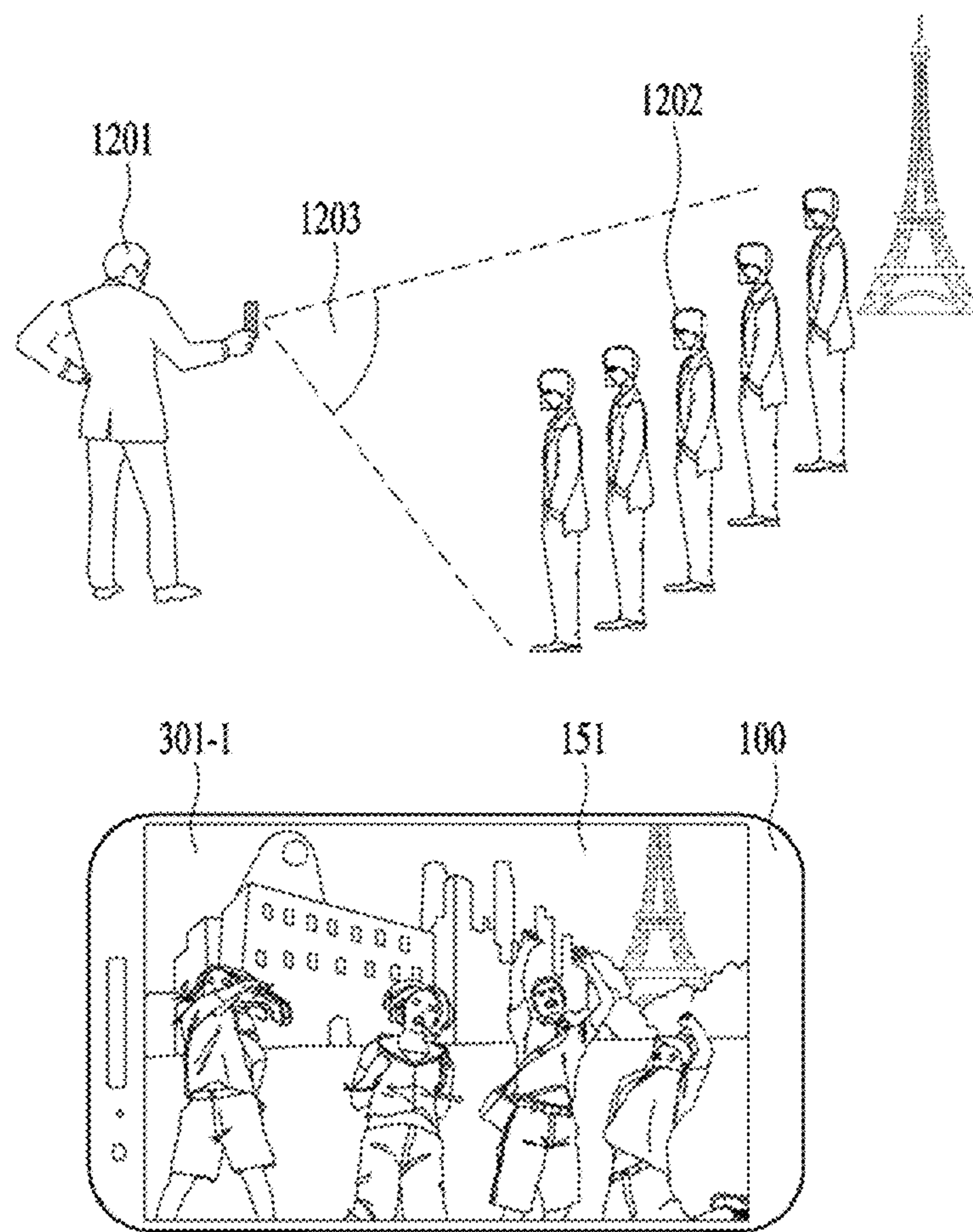


FIG. 12B

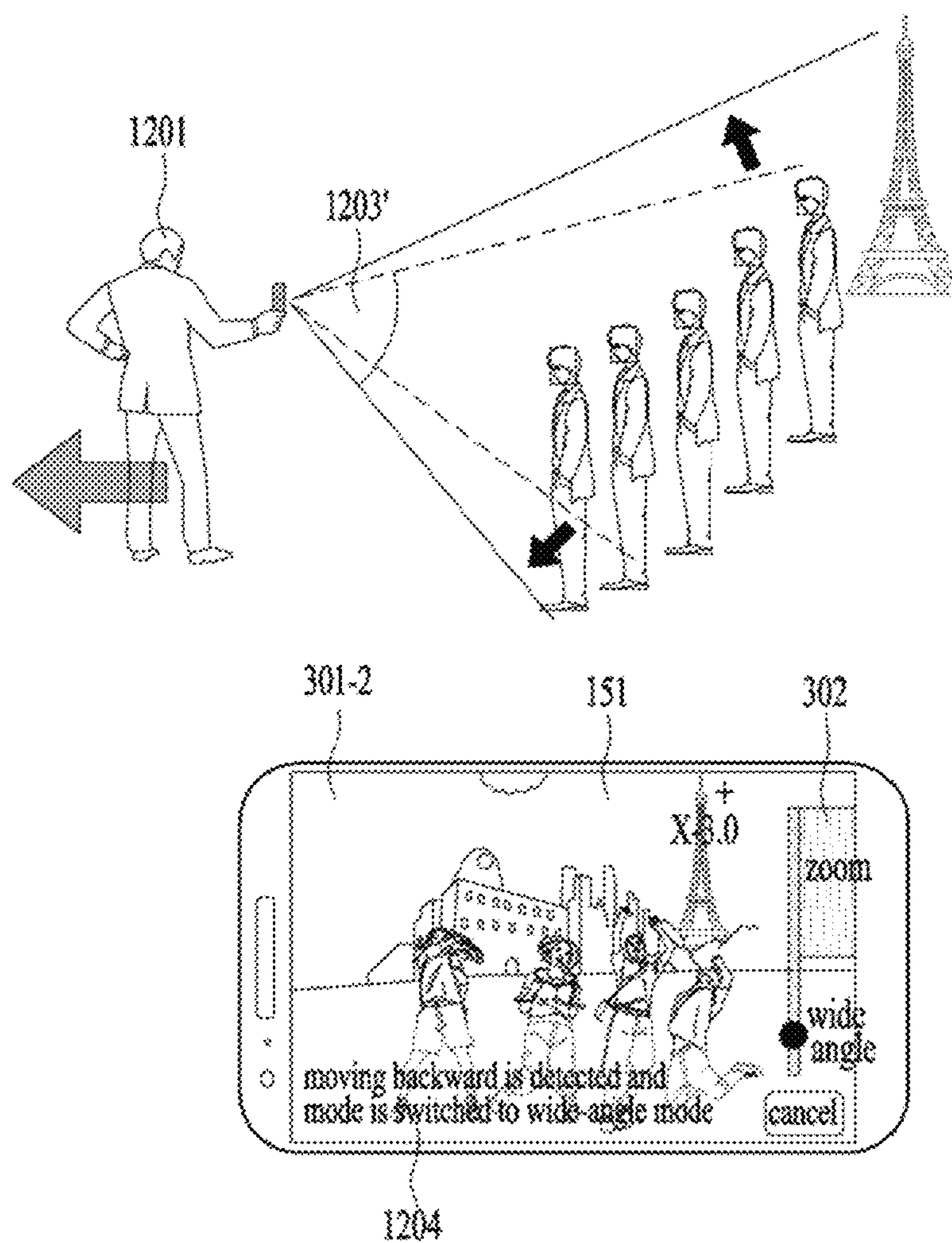


FIG. 13A

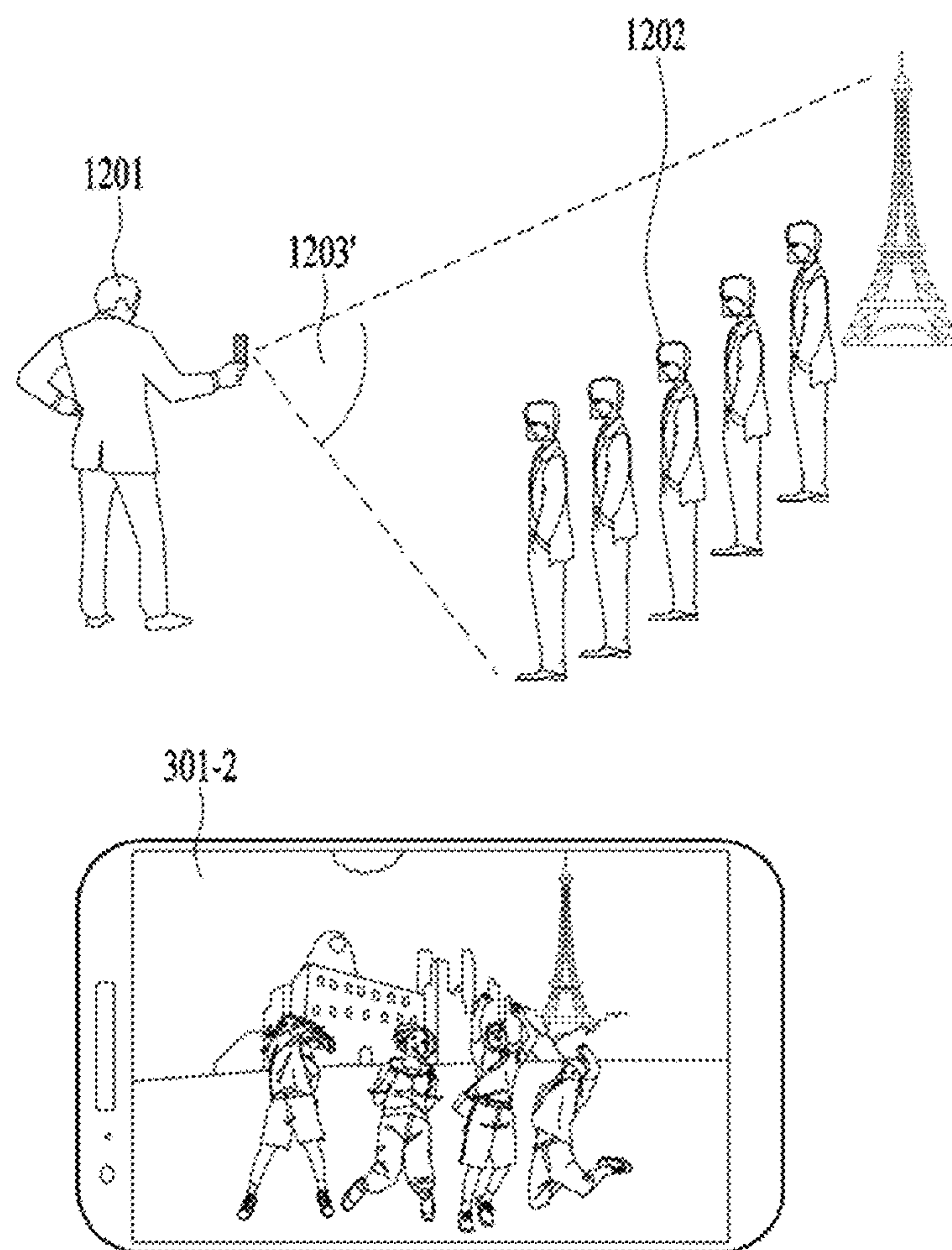


FIG. 13B

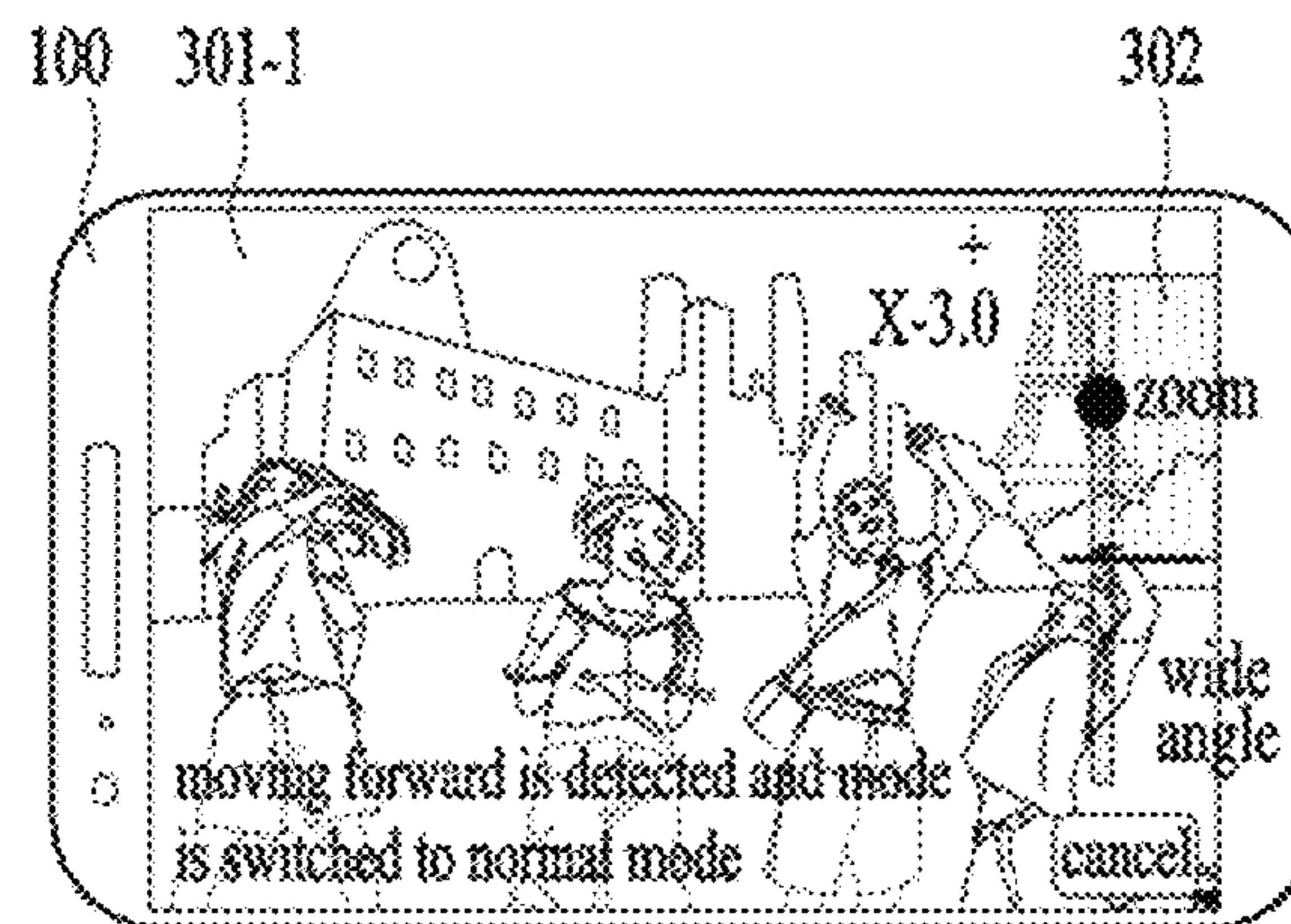
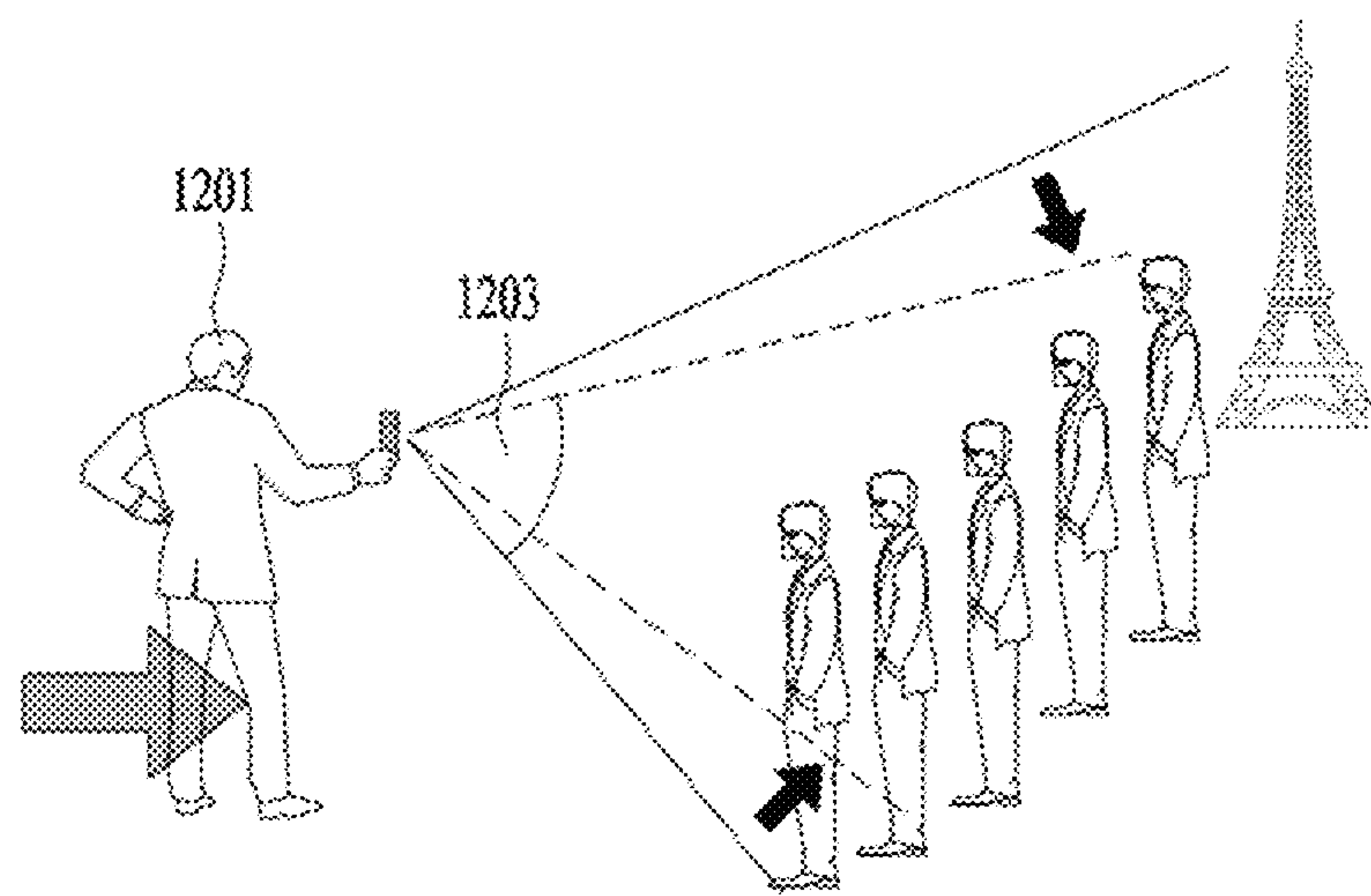


FIG. 14A

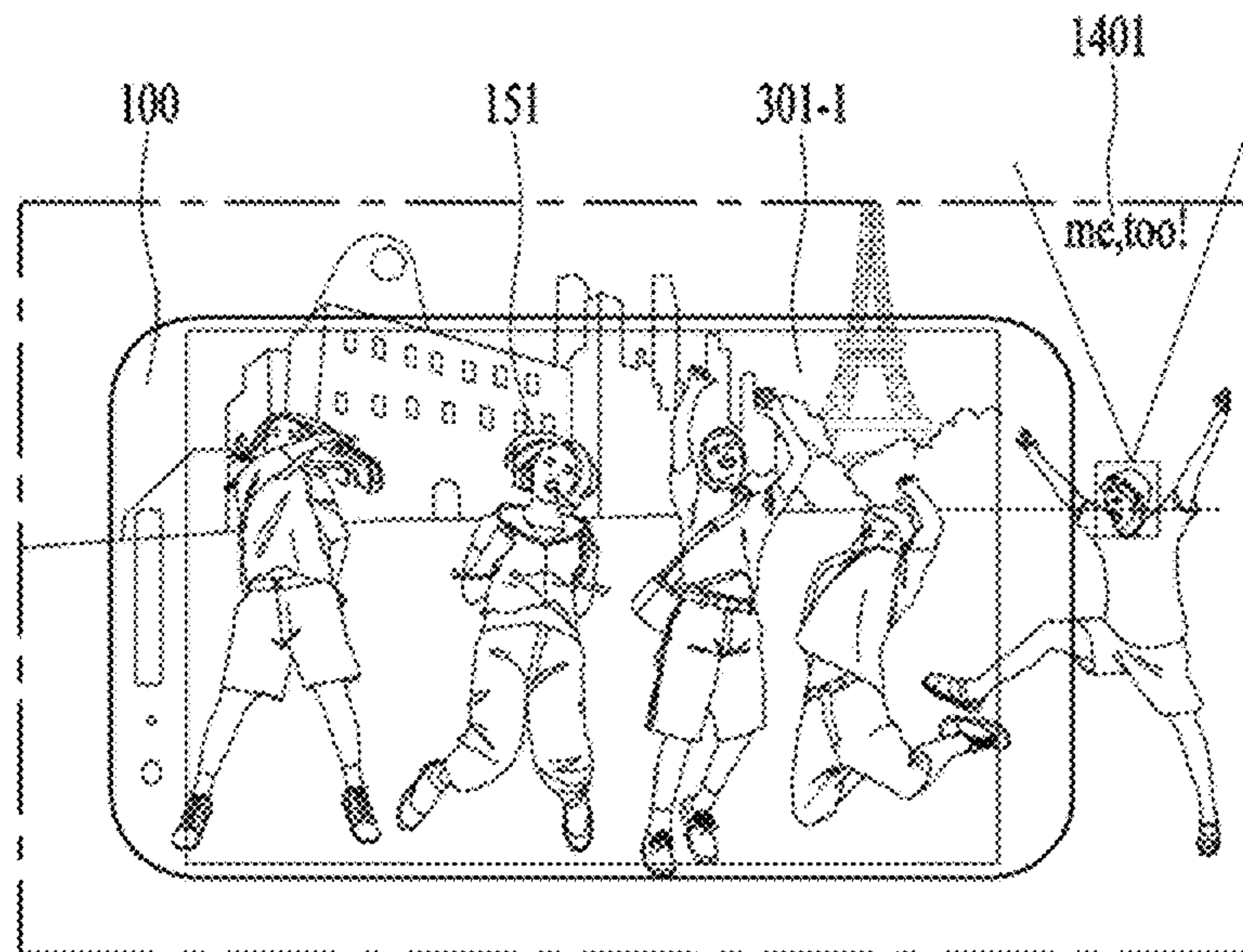


FIG. 14B

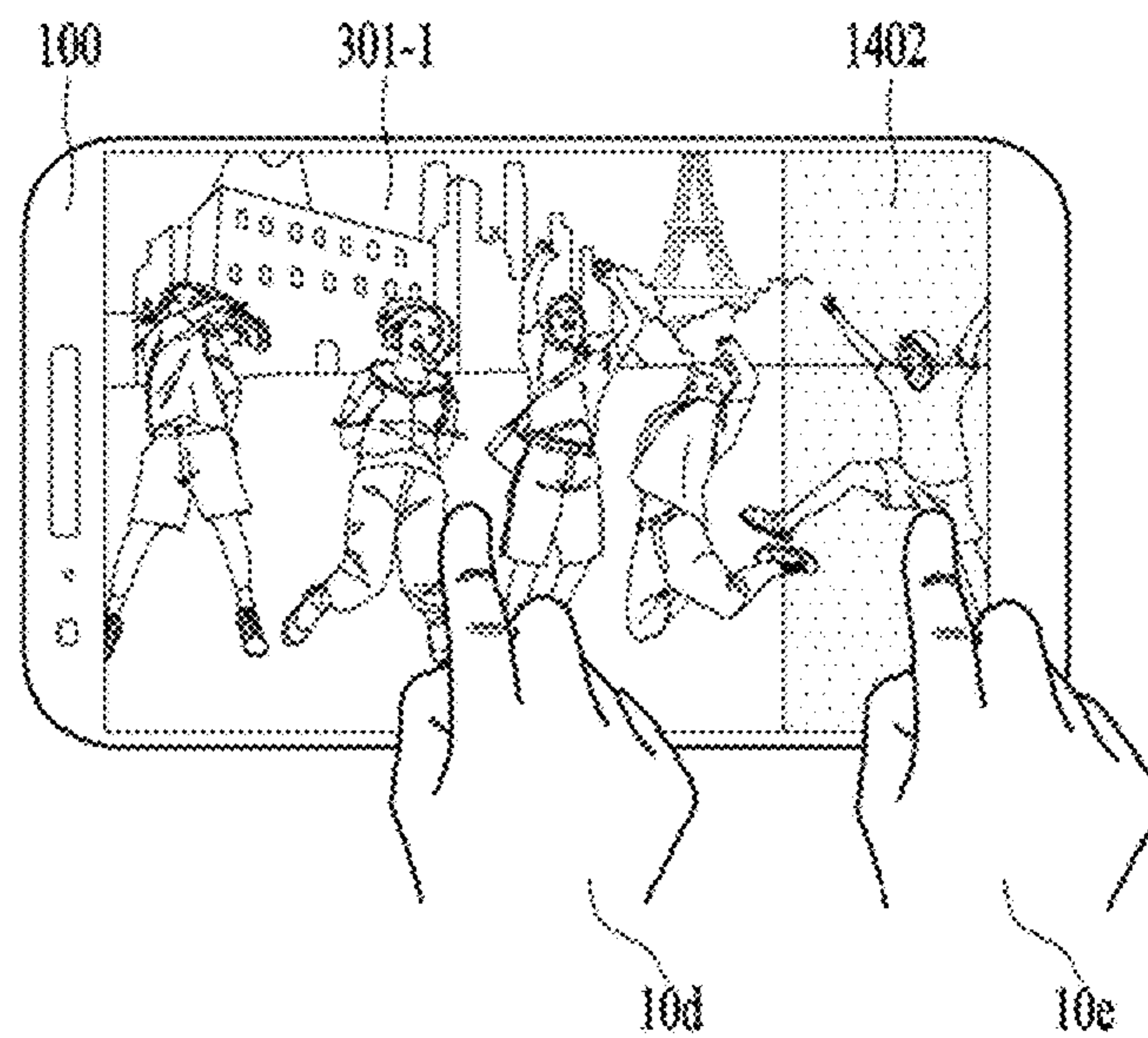


FIG. 15

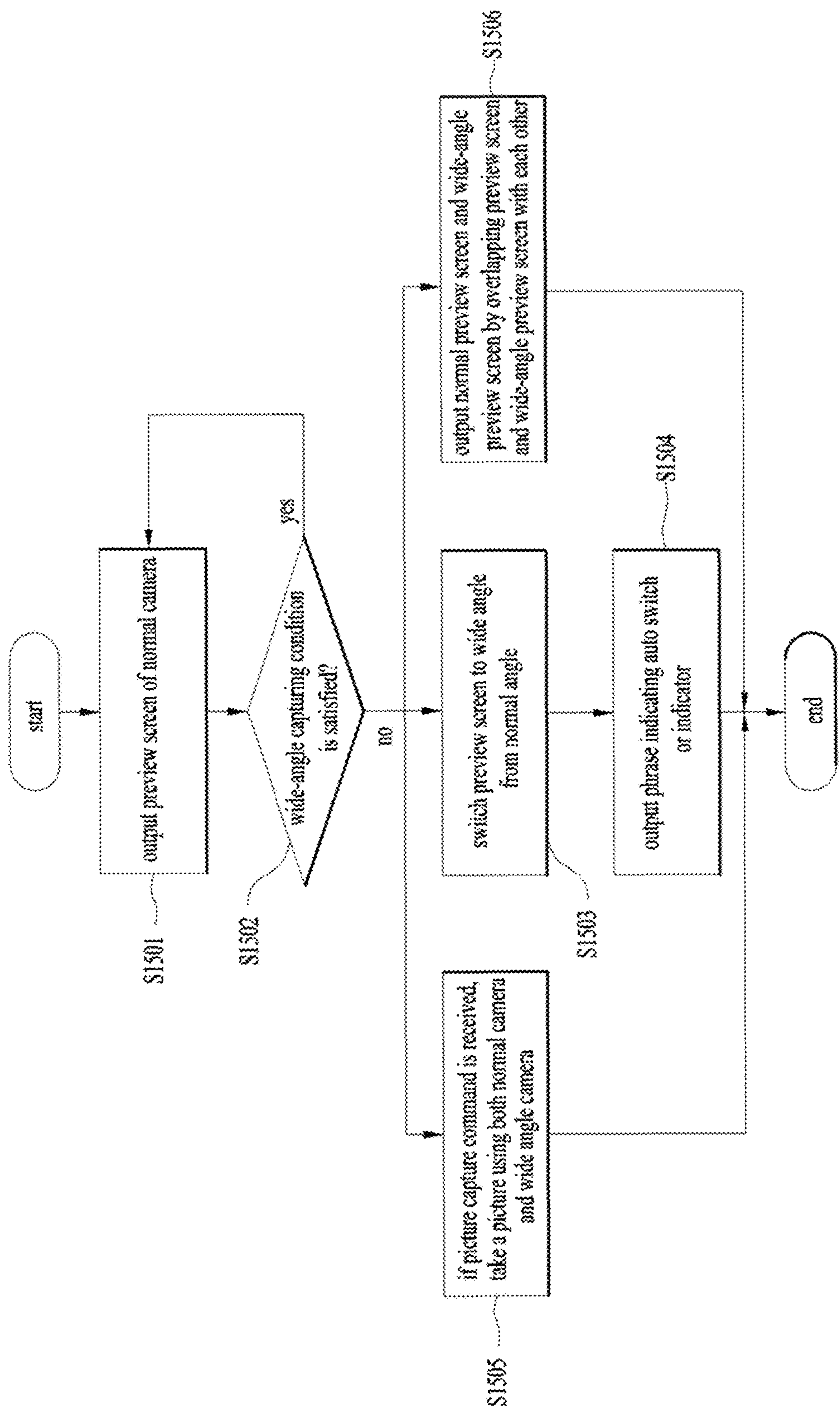


FIG. 16A

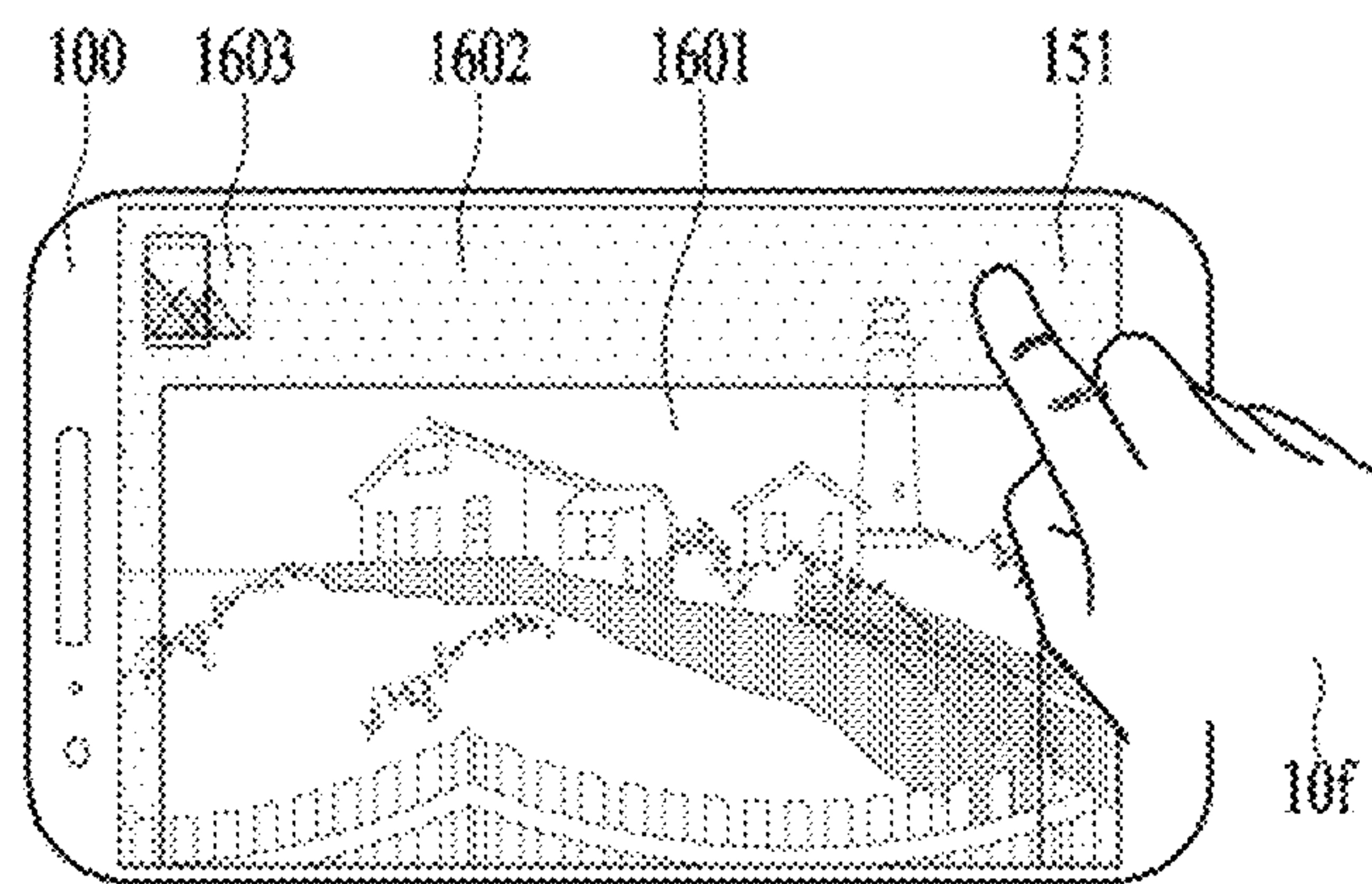


FIG. 16B

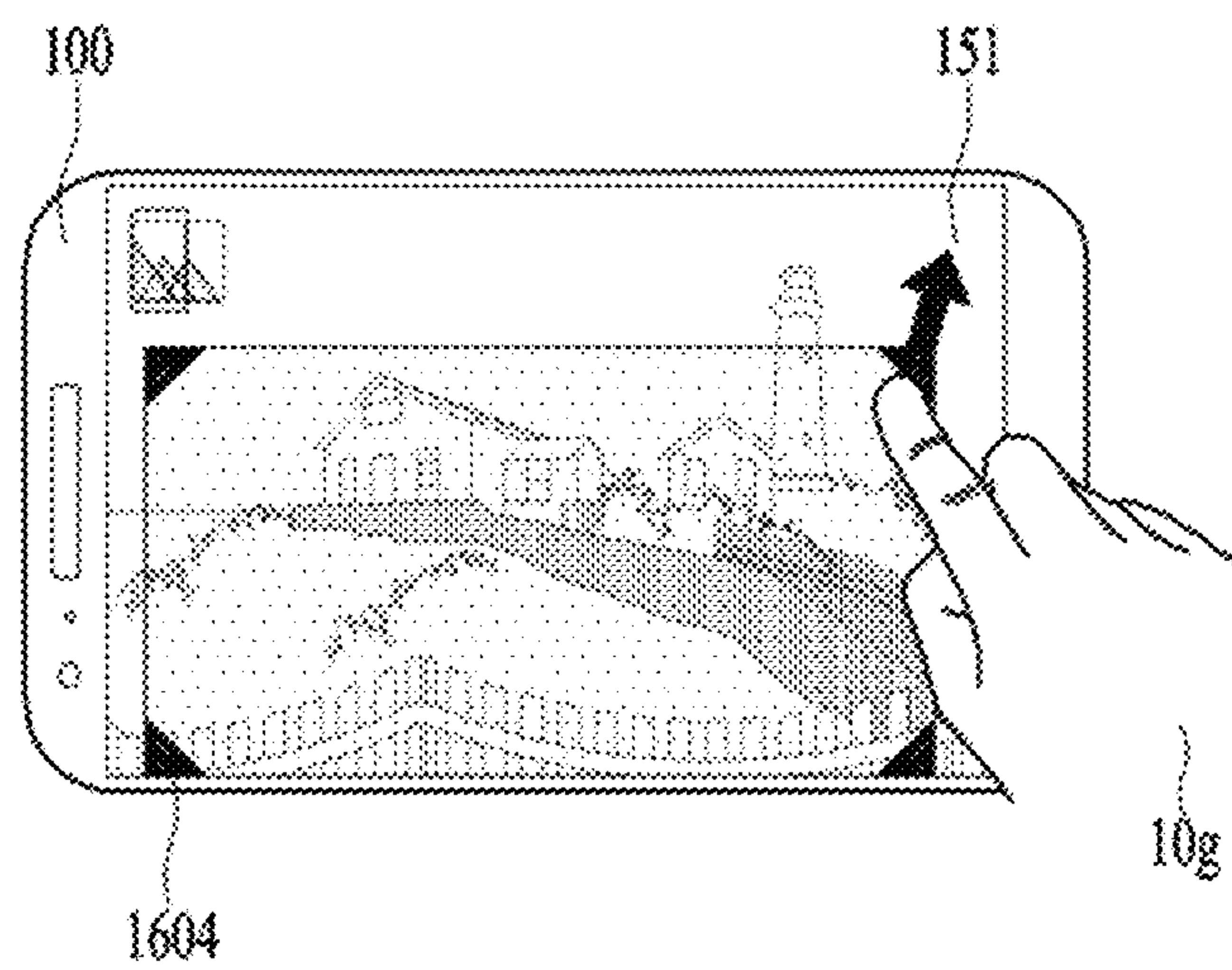


FIG. 16C

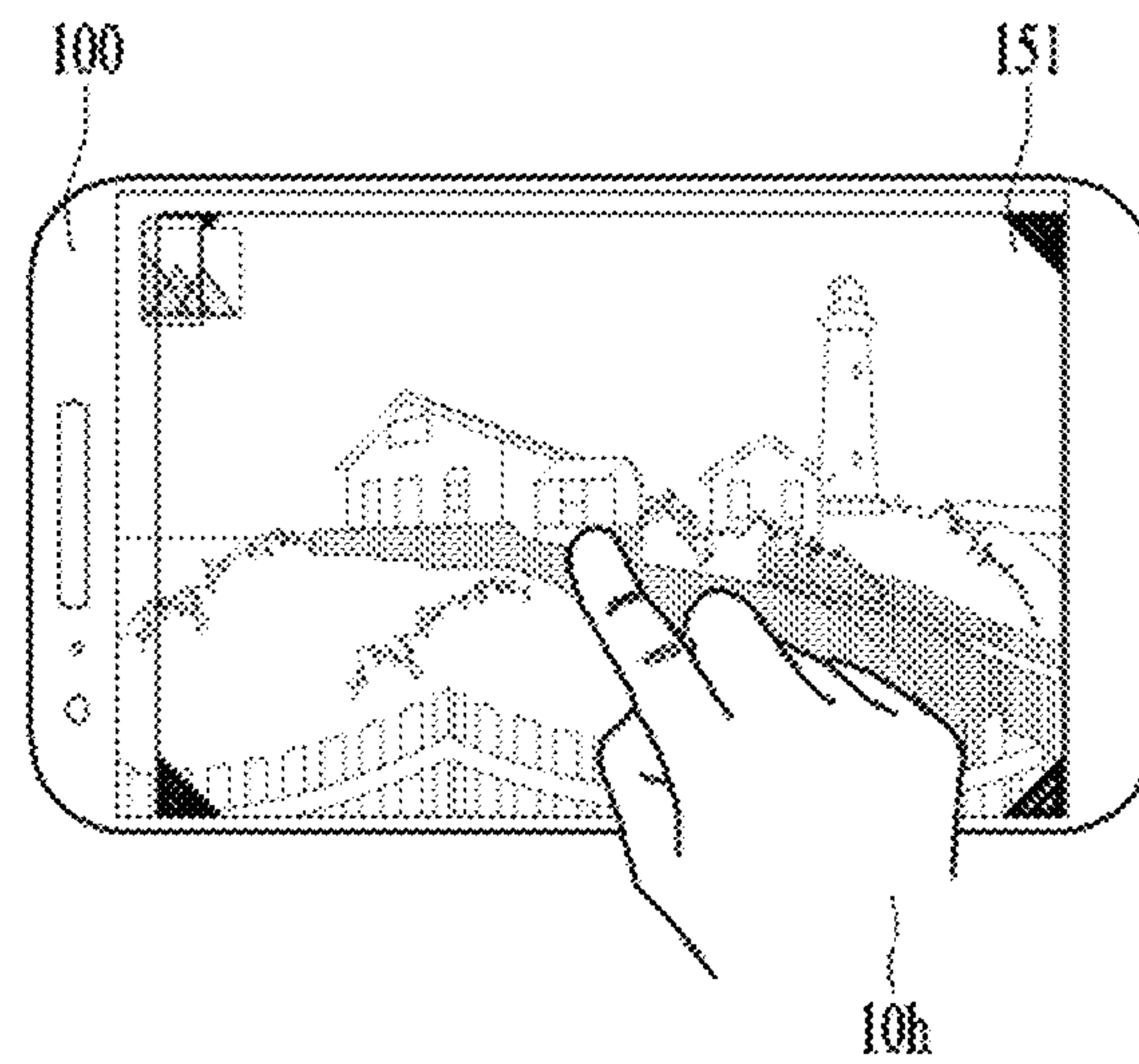


FIG. 16D

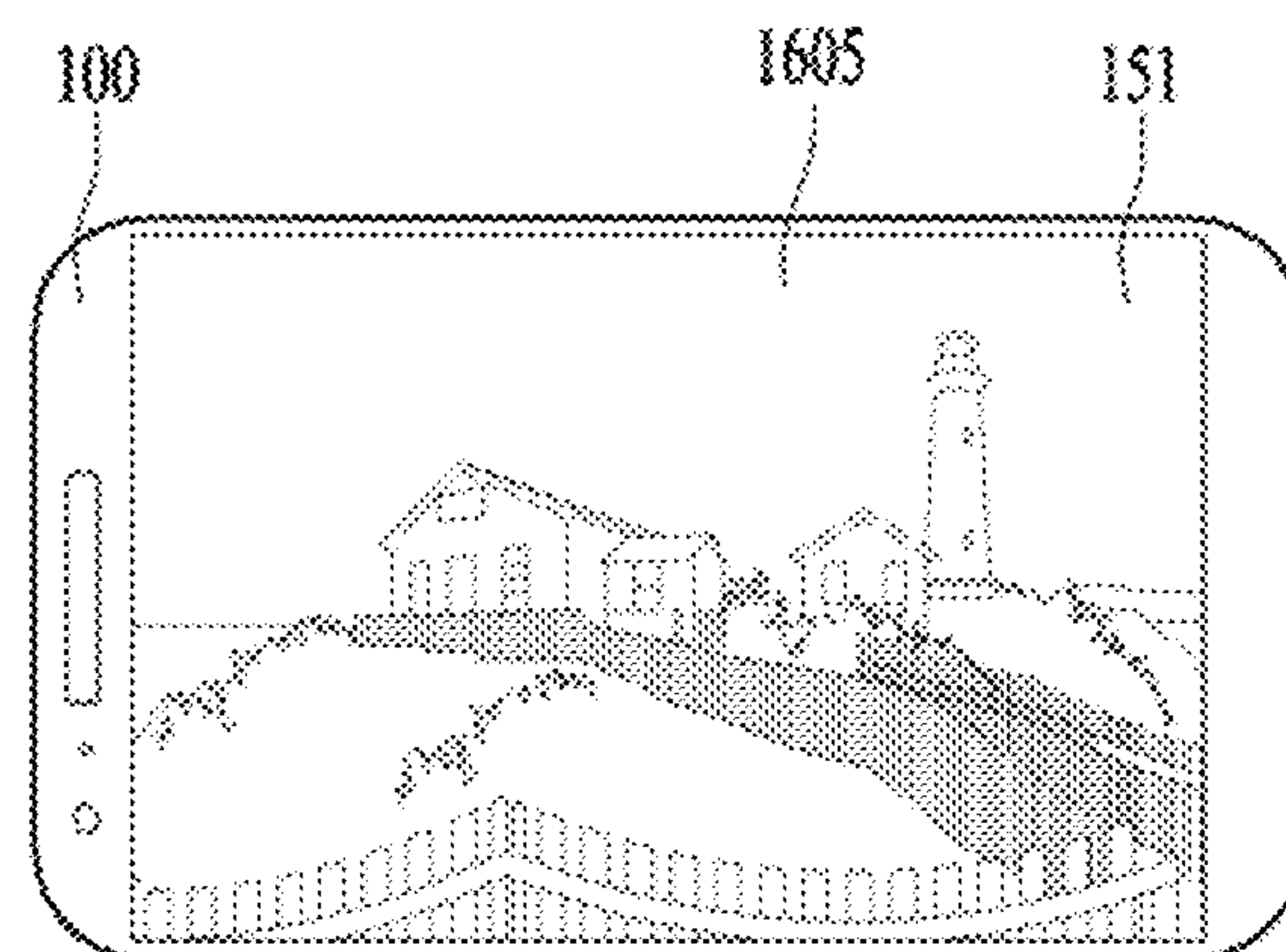


FIG. 17A

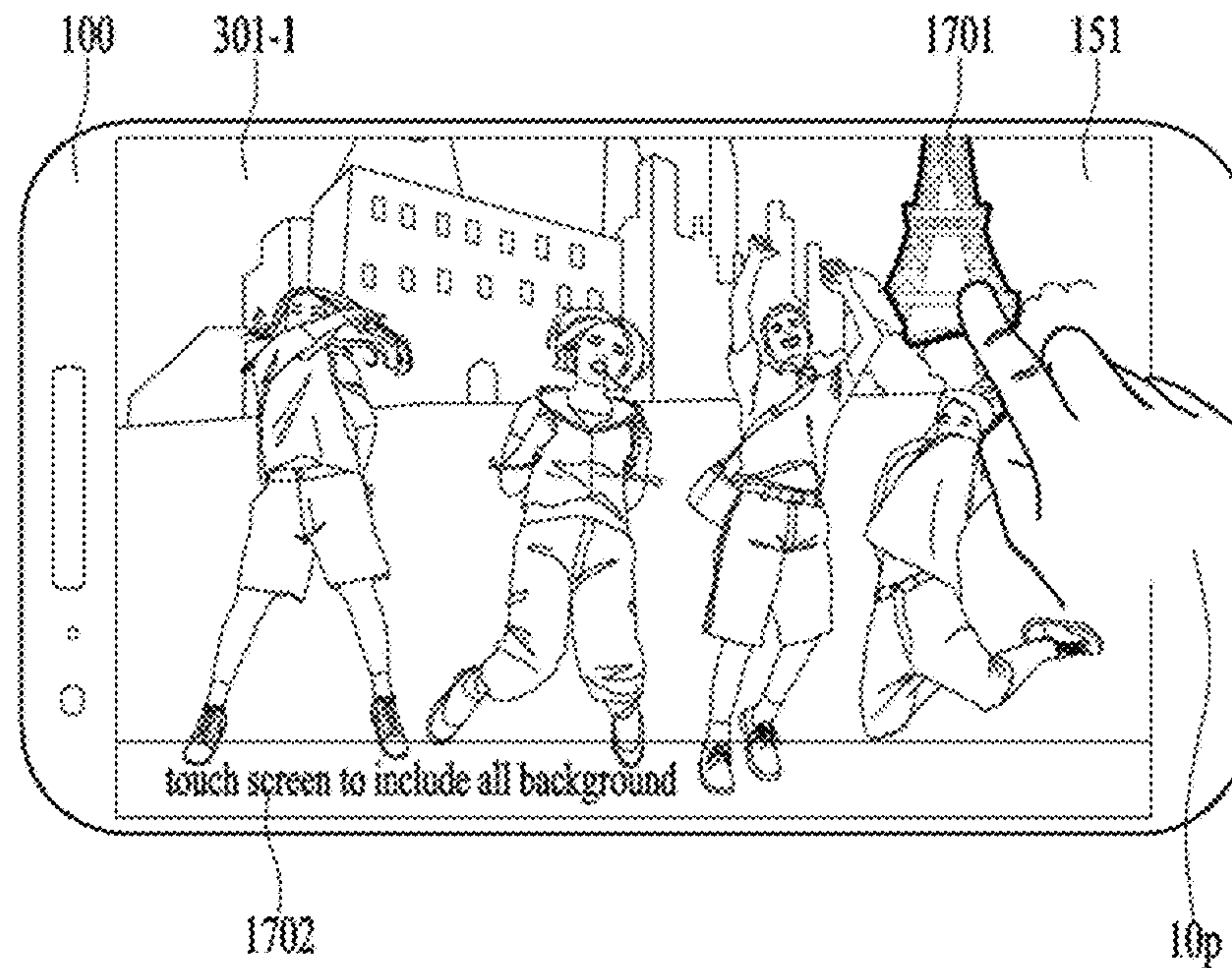


FIG. 17B

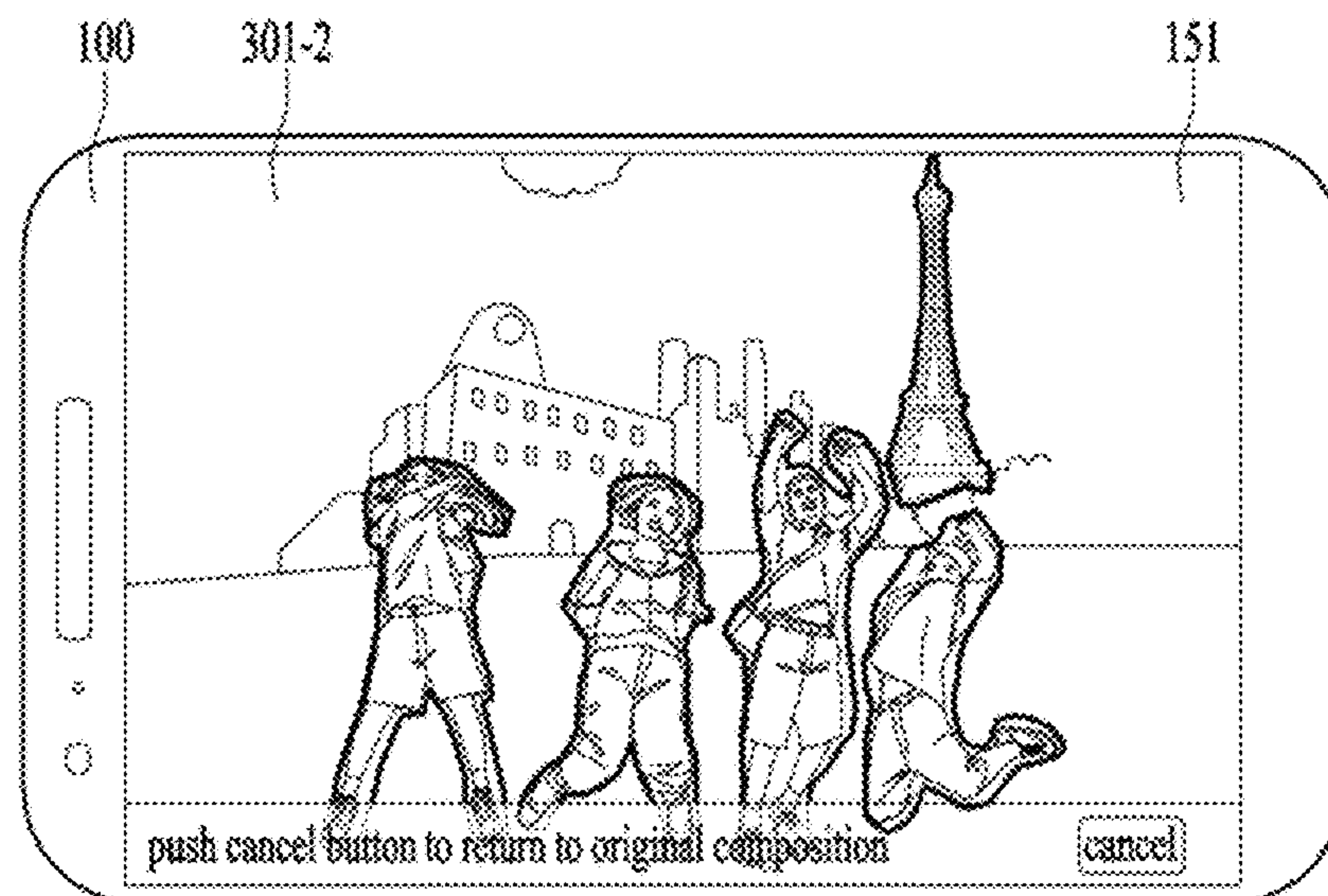


FIG. 18A

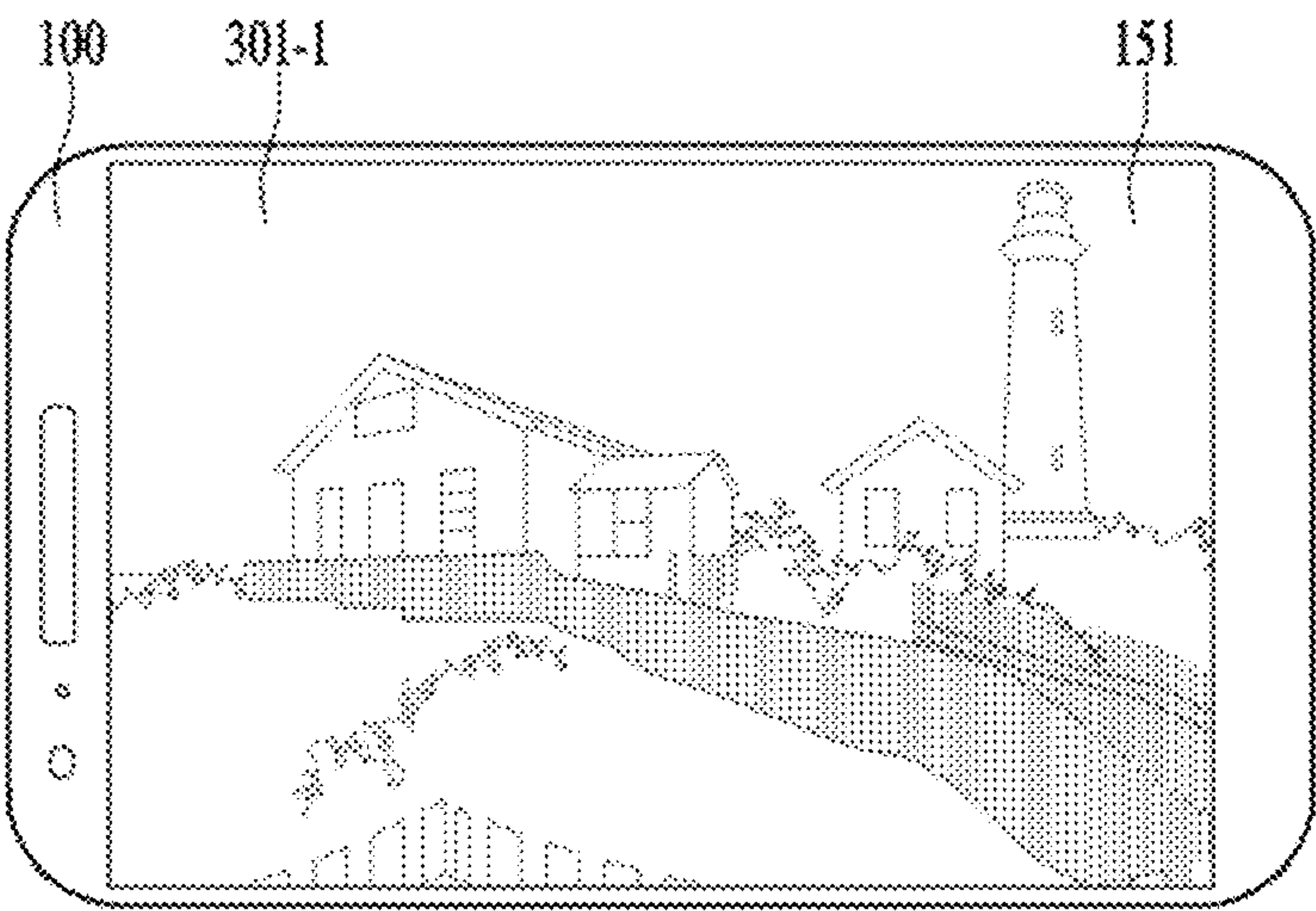


FIG. 18B

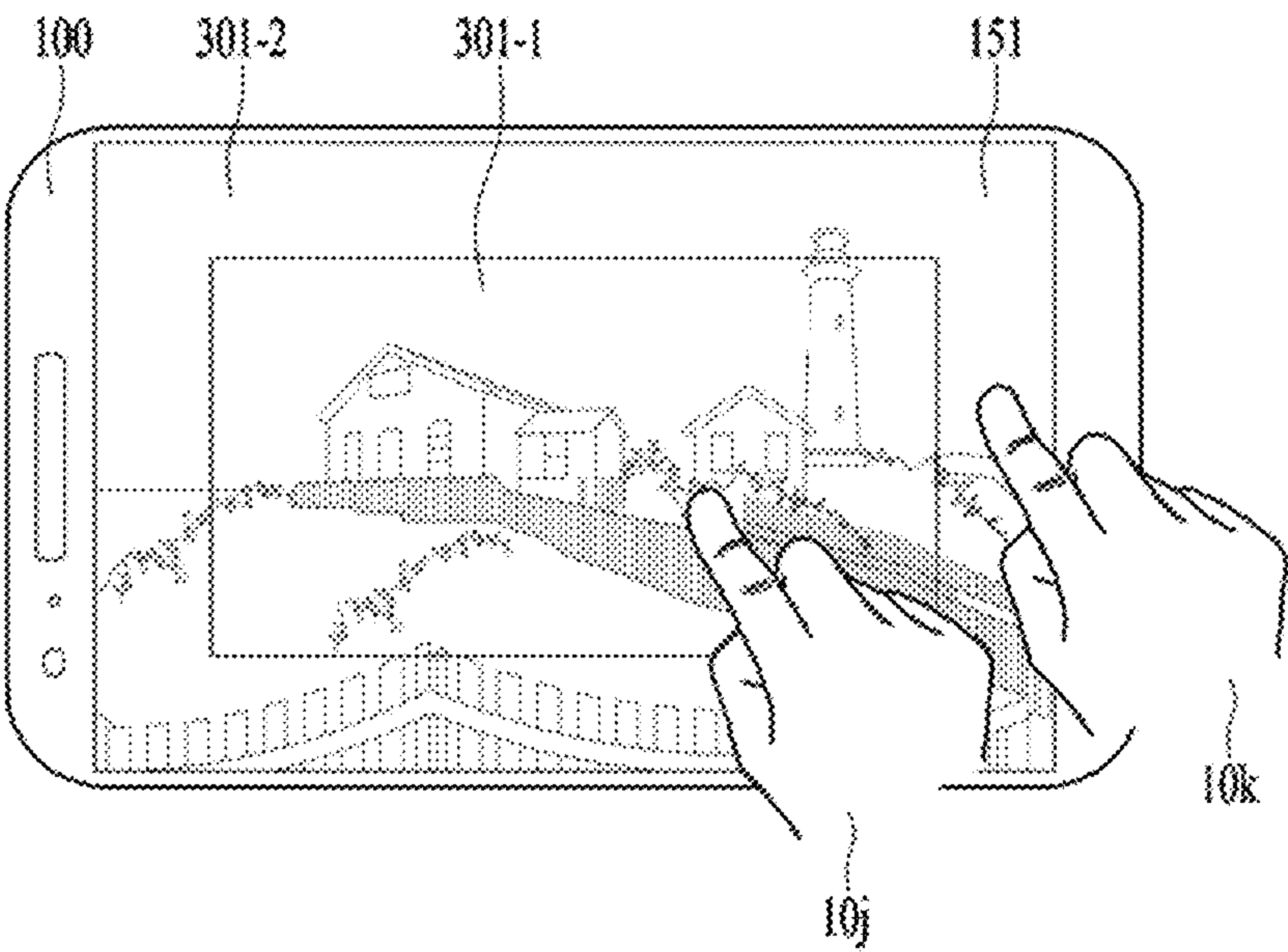


FIG. 19A

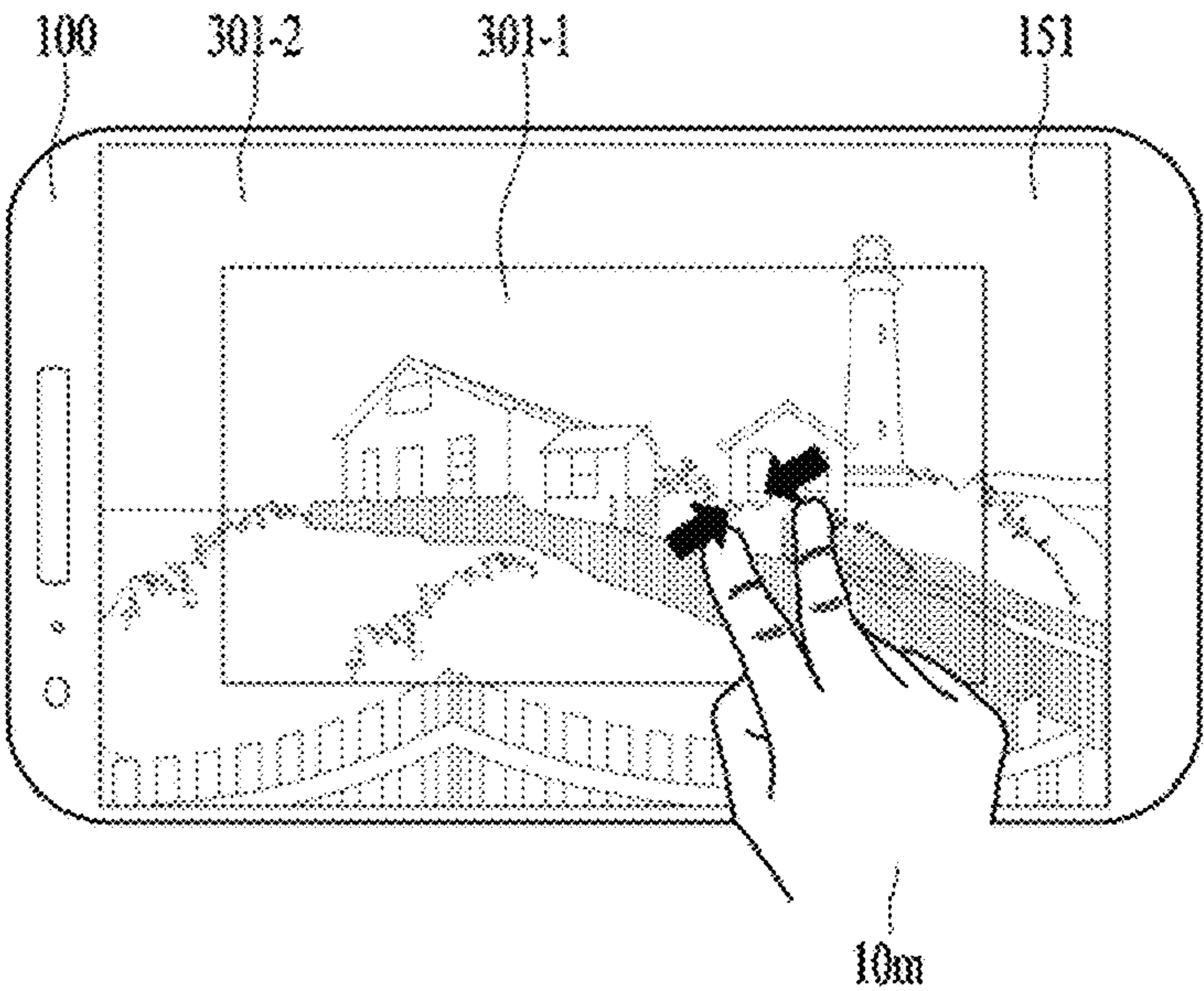
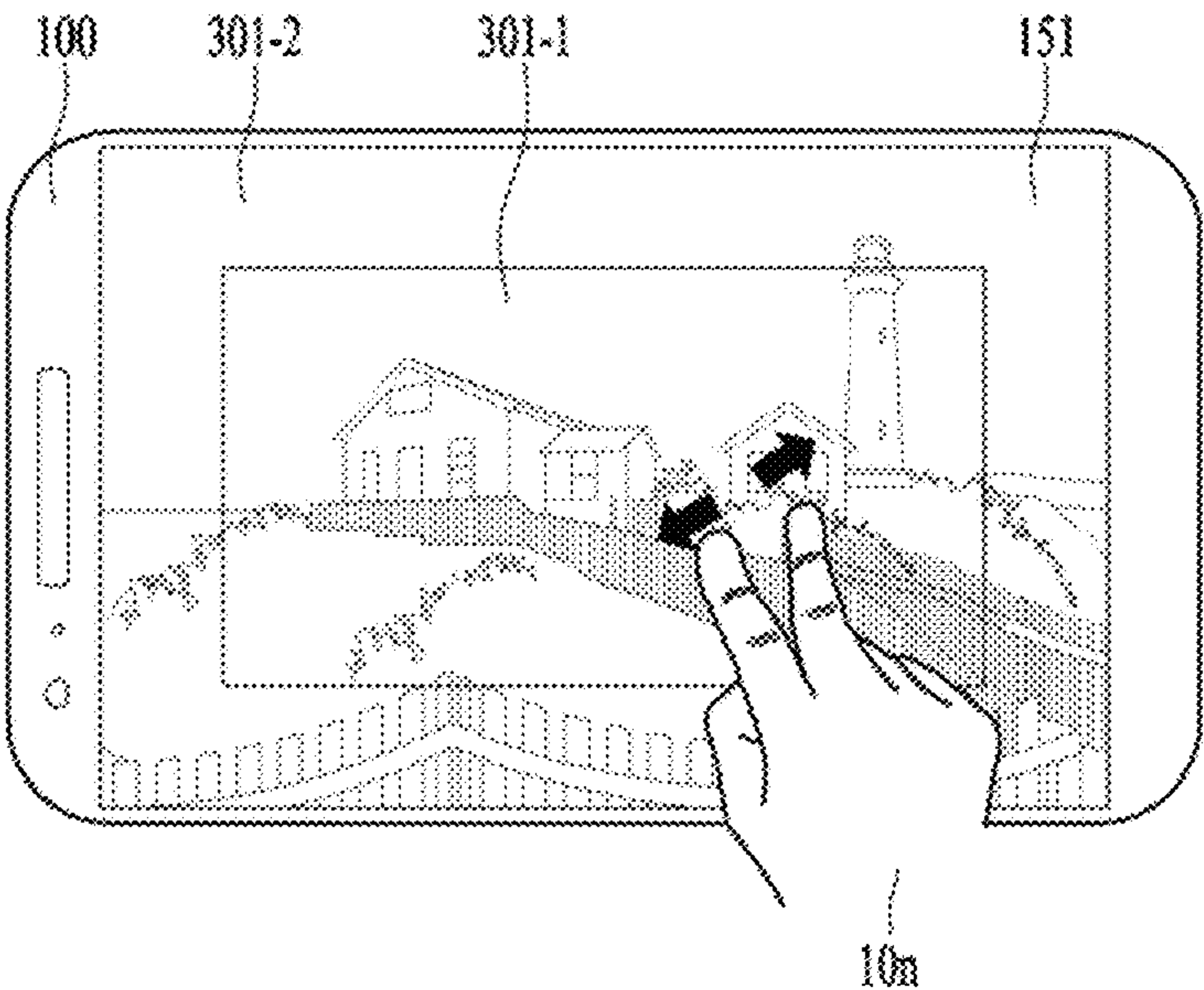


FIG. 19B



29. The mobile terminal of claim 28, wherein the distance condition is satisfied when the distance related value indicates that a distance between the mobile terminal and the main subject is greater than a prescribed distance.

30. The mobile terminal of claim 29, wherein the controller is further configured to cause the touch screen to display an image synthesized from the captured first image and second image. 5

31. The mobile terminal of claim 30, wherein the controller is further configured to cause the touch screen to display a graphic element to adjust a ratio of the first image to the second image for the synthesized image. 10

32. The mobile terminal of claim 30, wherein the synthesized image is generated by overlapping the first image and the second image such that an object in the first image coincides with the same object in the second image. 15

33. The mobile terminal of claim 30, wherein the controller is further configured to cause the touch screen to display a preview image synthesized from the first preview image and the second preview image before the first image and the second image are captured based on the distance related value satisfying the distance condition. 20

* * * * *