

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ELECTION SYSTEMS & SOFTWARE, LLC,  
Petitioner,

v.

HART INTERCIVIC, INC.,  
Patent Owner.

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PGR2020-00031  
Patent 10,445,966 B1

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Before CHARLES J. BOUDREAU, AMANDA F. WIEKER, and  
JASON M. REPKO, *Administrative Patent Judges*.

REPKO, *Administrative Patent Judge*.

JUDGMENT  
Final Written Decision  
Determining All Challenged Claims Unpatentable  
*35 U.S.C. § 328(a)*

## I. INTRODUCTION

Election Systems & Software, LLC (“Petitioner”) filed a petition to institute a post-grant review of claims 1–30 of U.S. Patent No. 10,445,966 B1 (Ex. 1001, “the ’966 patent”). Paper 2 (“Pet.”). Hart InterCivic, Inc. (“Patent Owner”) did not file a Preliminary Response.

On September 2, 2020, we instituted an *inter partes* review of all challenged claims based on all grounds in the Petition. Paper 6 (“Inst. Dec.”). Patent Owner filed a Response. Paper 14 (“PO Resp.”). Petitioner filed a Reply. Paper 19 (“Pet. Reply”). Patent Owner filed a Sur-reply. Paper 20 (“Sur-reply”). An oral hearing was held on July 6, 2021. A transcript of that hearing has been entered into the record. Paper 28 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued under 35 U.S.C. § 328(a). For the reasons that follow, Petitioner has shown by a preponderance of the evidence that claims 1–30 are unpatentable.

### A. *Related Matters*

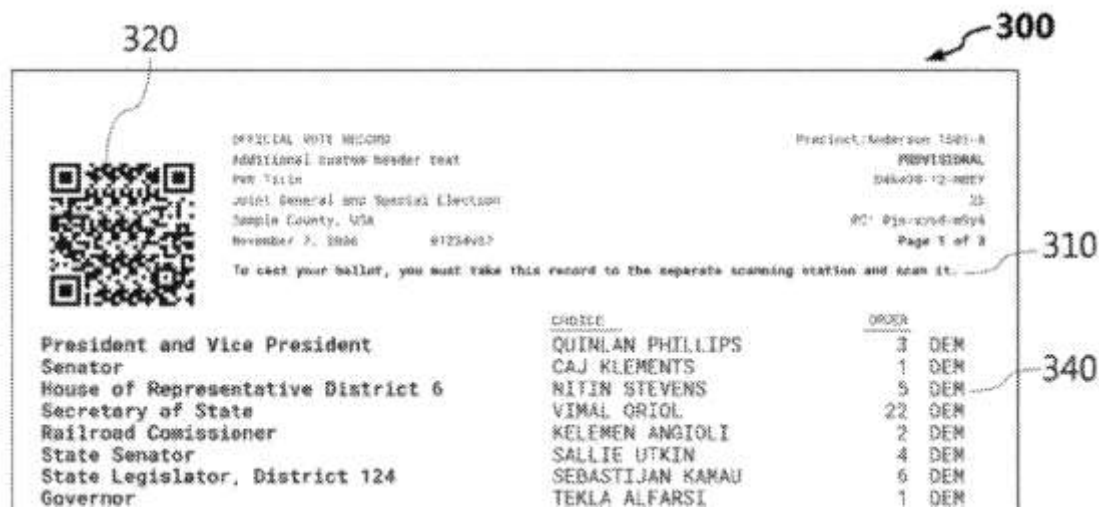
Neither party identifies any related matters. Pet. 1; Paper 4, 2 (Mandatory Notice).

### B. *The ’966 Patent*

The ’966 patent describes an electronic voting system that uses printed vote records (PVRs). Ex. 1001, 1:54–57. PVRs create an official record for later auditing. *Id.* at 1:29–31, 36. Electronic voting systems that create a paper record are called “hybrid voting” systems because they are a cross between hand-marked paper ballots and electronic systems. *Id.* at 1:31–34. In these hybrid systems, PVRs typically contain a bar code that encodes the voter’s selections. *Id.* at 1:40–42. The hybrid voting system then digitally scans the PVR’s bar code to create an electronic cast vote

record. *Id.* at 1:42–43. But, according to the patent, voters find that this system lacks transparency because they cannot read the bar code to confirm that their votes match the printed record and their intended vote selections. *Id.* at 1:43–47.

To improve transparency, the '966 patent's PVRs record the voter's selections using voter-readable characters. *See id.* at 1:48–57. For example, the top of a PVR generated by a ballot-marking device is shown below. *See id.*, Fig. 3.



**Figure 3 shows the PVR's header region 310 with instructions to the voter, voter selection section 340, which is readable by the voter, and bar code 320. *Id.* at 6:25–40.**

The system scans the PVR using optical character recognition (OCR) to record the votes. *Id.* at 1:57–59. That is, the voter can read the same data from which the system generates the cast vote record. *Id.* at 1:60–65. This allows the voter to confirm that the PVR matches the selections entered into the ballot-marking device. *Id.* at 6:40–43.

The system uses a bar code to detect counterfeit or altered PVRs. *Id.* at 2:31–32. The bar code includes a digitally signed hash. *Id.* at 2:33–36. During scanning, the system generates the OCR results and verifies them

with another hash. *Id.* at 2:36–38. In particular, the system produces a hash from the OCR-generated characters and compares them to the hash provided in the bar code. *Id.* at 2:38–40. According to the patent, this technique confirms that a known source printed the PVR and detects post-printing alterations. *Id.* at 2:40–44.

The system’s OCR process uses several techniques to improve recognition accuracy. *See id.* at 1:66–2:30. In one embodiment, the OCR process uses a dictionary of potential vote choices (such as candidate names) for pattern matching. *Id.* at 1:67–2:4. The OCR process may also use a Levenshtein distance algorithm for error detection. *Id.* at 2:20–22. This algorithm calculates a distance between the OCR data and each key in the dictionary. *Id.* at 2:22–24. If the distance is below a threshold, the data is matched to the dictionary entry. *Id.* at 2:24–26.

### C. Claims

Claims 1, 6, 11, 15, 20, 23, 28, and 29 are independent. Claim 1 is reproduced below.

1. A method for electronic voting using printed vote records, comprising:
  - recording a voter’s vote selections;
  - generating a printed vote record of the voter’s vote selections, the printed vote record containing voter readable text indicating the voter’s vote selections;
  - scanning the printed vote record, the scanning including scanning the voter readable text;
  - utilizing optical character recognition (OCR) on the scanned voter readable text to create a data set which identifies the voter’s vote selections; and

generating a cast vote record from the data set so that voter selections in the cast vote record are based on the voter readable text,

wherein identifying the voter's vote selection includes comparing the data set to an election dictionary, the election dictionary containing potential vote choices,

wherein the comparing the data set to the election dictionary is utilized to confirm an accuracy of the OCR to limit potential OCR errors.

Ex. 1001, 8:43–62.

*D. Evidence*

<b>Name</b>	<b>Reference</b>	<b>Exhibit</b>
Brockhouse	US 2014/0231513 A1, published Aug. 21, 2014	1004
Heilper	US 7,406,201 B2, issued July 29, 2008	1005
Nadaf	BR 10 2013 018558-2 A2, published Sept. 2, 2014	1006 (original), 1007 (translation)
Backert	US 9,401,059 B2, issued July 26, 2016	1008
Herskowitz	US 6,971,574 B1, issued Dec. 6, 2005	1009

Petitioner also relies on the declarations of Michael I. Shamos, Ph.D., J.D. Ex. 1003 (“Shamos Decl.”); Ex. 1055 (“Shamos Suppl. Decl.”). Patent Owner relies on the declaration of Daniel P. Lopresti, Ph.D. Ex. 2006 (“Lopresti Decl.”).

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