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Application Number	UNKNOWN
Filing Date	HEREWITH
First Named Inventor	JAMES M. CANTER ET AL.
Title	OPTICAL CHARACTER RECOGNITION OF VOTER SELECTIONS FOR CAST VOTE RECORDS
Art Unit	UNKNOWN
Examiner Name	UNKNOWN
Attorney Docket Number	HART:032C6

SIGNATURE of Applicant or Patent Practitioner

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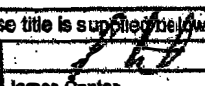
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Patent Application for

Optical Character Recognition of Voter Selections for Cast Vote Records

Inventors: James M. Canter, Drew E. Tinney, levgen Konovalenko

BACKGROUND OF THE INVENTION

[0001] This application claims priority to Patent Application No. 17/225,357 filed April 8, 2021 which claims priority to Patent Application No. 16/919,267 filed July 2, 2020, now Patent No. 11,004,292, which claims priority to Patent Application No. 16/745,621 filed January 17, 2020, now Patent No. 10,950,078, which claims priority to Patent Application No. 16/560,222 filed September 4, 2019, now Patent No. 10,573,111, which claims priority to Patent Application No. 16/239,607 filed January 4, 2019, now Patent No. 10,445,966, which claims priority to Provisional Patent Application No. 62/711,212 filed July 27, 2018, the disclosures all of which are expressly incorporated herein by reference.

[0002] The present disclosure relates to the voting systems for elections. More specifically, it provides a system and method for providing paper records of voter selections and generating cast vote records from those paper records.

[0003] A variety of electronic voting systems are well known. Electronic systems include, for example, direct recording electronic (DRE) voting systems that electronically record votes to directly create an electronic cast vote record. Electronic systems also include, for example, systems in which paper vote records are generated based on a voter's electronic vote selections, with the paper vote record then being scanned for creation of the electronic cast vote record and electronic tabulation. As used herein, an electronic cast vote record is an electronic record that indicates the determined voter's choice or selection in a manner determined in accordance with the voting system. Thus, an

electronic cast vote record is an electronic record of a voter's cast voting selections and may be used in the vote tabulation process.

[0004] The use of paper records in an electronic voting allows the creation of a paper trail of voter selections, for example for use by an elections office for audit purposes. Such voting systems have also been called "hybrid voting" as it is a cross between all electronic DRE voting and paper-based hand-marked ballots. Such hybrid systems provide an electronic voting system in which a printed vote record (PVR) is produced (allowing a paper record to be an official record), and then the PVR is scanned on a digital scanner for cast vote record creation. The PVR may be full sized sheets of paper (for example standard 8.5 x 11 inch or 8.25 x 14 inch paper stock) or may be other specialized sizes. Traditionally, the PVR contains a barcode that is encoded with the voter's vote selections. The barcode is then scanned with a scanner and decoded to generate the electronic cast vote record. It has been found though, that some voters may find such a process to lack transparency as the voter cannot readily review the barcode to confirm the encoded data matches the voter's vote selections.

[0005] It would be desirable to provide an electronic voting system that utilizes PVRs in a manner that provides better transparency to the voter.

SUMMARY OF THE INVENTION

[0006] In one embodiment, the present disclosure describes an electronic voting system that utilizes printed vote records (PVRs) in which a voter's vote selections are recorded in voter readable characters. Optical character recognition (OCR) techniques may then be utilized to scan the PVR to record the voter's selections. The OCR data is then utilized to generate the cast vote record. Thus, the electronic voting system directly interprets the voter selections from the PVR just as the voter sees the data. In this manner "what you see is what you get" printed vote record data is provided for a voter's viewing and that same data is used to generate the cast vote record.

[0007] Further, the OCR process utilized accounts for and corrects for potential OCR errors. In one embodiment, an election dictionary is provided of the potential vote choices. Thus, for example, candidate names may be entered into the election dictionary and utilized for pattern matching to the OCR results. To further ensure accuracy (and address candidates which may have the same or similar names), the sequence number affiliated with a particular candidate may be utilized. Further, the line number (or even the contest title itself) on the PVR may also be utilized as a contest identifier. In one embodiment, the OCR'ed name and additional data may be utilized together as the key into the election dictionary. The additional data may be data related to a candidate, but being more than just the candidate name. For example, in some embodiments, the additional data may be the sequence number and/or line number data. Thus, for example, the OCR'ed name and sequence number, the OCR'ed name and line number, or the OCR'ed name, sequence number and line number may be utilized together as the key into the election dictionary. In addition, a long string matching algorithm may be utilized to provide error detection to the string. In one embodiment, the Levenshtein distance algorithm may be utilized for such string error detection. More specifically, the Levenshtein technique is used for error detection and the calculation of a "distance" between the OCR data and each key in the dictionary. If a calculated distance is below a defined threshold, then the data is matched to that dictionary entry. Then as described below, a hash check indicates if all of the matches were correct. In this manner, OCR data errors may be eliminated leading to a more robust OCR result which may be used for the subsequent generation of a cast vote record.

[0008] Further, to ensure the PVR is valid and/or has not been altered after printing, a barcode is also provided on the PVR. The barcode includes a single digitally signed hash that may be generated by using a secure hash function to indicate the PVR is valid and a one way hash of the voter's vote selections. As part of the scanning process, the optical character recognition results may be generated and then verified by use of another hash process. More specifically, a hash produced from the OCR generated characters may be compared to the hash provided in the barcode. Such techniques confirm that the PVR was printed from a known source and that the PVR has not been

altered from its original state. In this manner, a counterfeit PVR or a PVR that has had its characters altered may be detected. Moreover, if the PVR was improperly or tampered with when printed this technique may detect such tampering.

[0009] To further ensure the accuracy of the OCR process, additional processing beyond traditional OCR processes may also be utilized for recognizing the characters presented on the PVR.

[0010] In one embodiment, a method for electronic voting using printed vote records is provided. The method comprises recording a voter's vote selections and 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. The method further comprises scanning the printed vote record, the scanning including scanning the voter readable text. The method also includes 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.

[0011] In another embodiment, a method for electronic voting using printed vote records is provided. The method may comprise recording a voter's vote selection with a ballot marking device and generating a printed vote record of the voter's vote selections, the printed vote record containing voter readable text including a candidate name of a voter's vote selection. The method further comprises electronically scanning the printed vote record, the scanning including scanning the candidate name. The method also includes utilizing optical character recognition (OCR) on the scanned candidate name to create a first data set. The method further comprises comparing the first data set with an election dictionary and generating a cast vote record based on the comparing of the first data set with the election dictionary so that voter selections in the cast vote record are based on is based at least in part on the scanned candidate name.

[0012] In yet another embodiment, a method for electronic voting using printed vote records is provided. The method comprises recording a voter's vote selections and 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, the printed vote

record further including a bar code. The method further comprises electronically scanning the printed vote record, the electronic scanning including scanning the voter readable text and scanning the bar code. The method also includes 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.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] A more complete understanding of the present invention and advantages thereof may be acquired by referring to the following description taken in conjunction with the accompanying drawings, in which like reference numbers indicate like features. It is to be noted, however, that the accompanying drawings illustrate only exemplary embodiments of the disclosed concept and are therefore not to be considered limiting of its scope, for the disclosed concept may admit to other equally effective embodiments.

[0014] Figure 1 illustrates an exemplary voting system for utilizing the techniques described herein.

[0015] Figure 2 illustrates an exemplary ballot marking device for utilizing the techniques described herein.

[0016] Figure 3 illustrates an exemplary printed vote record generated by the ballot marking device.

[0017] Figure 4 illustrates an exemplary printed vote record process flow utilizing the techniques described herein.

[0018] Figure 5 illustrates an exemplary process flow for matching OCR data to ballot choices.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0019] Figure 1 illustrates one exemplary embodiment of a voting system for utilizing the techniques described herein. It will be recognized, however, that the techniques described herein may be utilized in a wide range of other voting systems. As shown in Figure 1, a voting system 10 that may be located at a polling location includes a ballot marking device (BMD) 15, a scanner 20 and a computing device 25. In one embodiment of a voting process, a polling official and/or the voter may activate a voting session on the BMD 15 (in one example by providing an access code to a voter to access the BMD 15). After activation, the voter may then make voting selections on the BMD 15. When the voter has completed their selections, the BMD 15 may then print out a PVR of the voter's voting selections. As described above and explained in more detail below, the voter's selections may be indicated on the PVR using readable characters so that the voter may visually confirm their voting selections, thus providing voting transparency to the voter. The voter may then enter the PVR into a scanner 20 which provides a scanned image of the PVR. The scanner 20 may provide that scanned image of the PVR to a computing device 25 which is connected to the scanner 25. The computing device may then perform an OCR process on the scanned image. The computing device 25 may also provide improved accuracy and/or error correction of the OCR by utilizing data processing techniques that are described herein to enhance the conversion of the scanned image to usable data. The scanning hardware for the scanner 20 may be conventional scanning hardware. However, as described in more detail below, specialized data analysis of the scanned information may be provided to improve the integrity and reliability of the scan. Such data analysis may be accomplished with the computing device 25. The computing device may then generate an electronic cast vote record associated with the voter's selections. It will be recognized that the functionality of the computing device may alternatively be integrated within the scanner 20. The BMD 15, scanner 20 and computing device 25 may each be separate non-integrated devices. Alternatively, all or some of the functionality of these devices may be integrated together within one device.

[0020] Figure 2 illustrates an exemplary BMD. However, it will be recognized that a wide range of other BMDs may be utilized while still achieving the advantages of the voting process described herein. The BMD 100 of Figure 2 includes a display 105, a voting

processing unit 110 and a printer medium input tray 115. The voting processing unit 110 may include a variety of hardware and software, including a memory, processors, associated election software, input devices, etc., all as is known in the art. In operation, a voter may utilize the BMD 100 as part of the process of casting a vote in an election. The voter may be provided instructions and voting choices that are presented on the display 105 of the BMD 100. Various voter responses and election selections may be entered via the display (in the case of a touchscreen display) or may entered via other inputs such as a keypad, buttons, dials, etc. that may be part of the voting processing unit 110. The BMD 100 also includes an internal printer (not shown). The printer may be utilized to print a voter's selections on a PVR. In one embodiment, the printer may be a thermal printer and the PVR may be printed on thermal paper. In operation, a voter uses the BMD 100 to generate a PVR. The PVR may then be scanned and processed as described elsewhere herein to create an electronic cast vote record. As described herein, the PVR may be utilized not only as part of the cast vote record generation process, but also as a tool for the voter to inspect the generated vote selections prior to casting the voter selections through the scanning process.

[0021]As described herein, the BMD may be a hybrid voting device that combines electronic voting features with the production of a PVR. Such a technique allows voting transparency to the voter and provides the election officials a paper record which may be used for audit or other purposes. The PVR may be a full sheet of standard paper stock or may be other customized sizes. As described herein, OCR may be used to determine the voter selections with the add-on of additional data process techniques to ensure data accuracy of the OCR process and ensure validity of the PVR.

[0022]As mentioned, OCR techniques may be utilized to scan the PVR to record the voter's selections. The OCR data is then utilized to generate the cast vote record. Thus, the electronic voting system directly interprets the voter selections from the PVR just as the voter sees the data. In this manner "what you see is what you get" printed vote record data is provided for a voter's viewing and that same data is used to generate the cast vote record.

[0023] Further, the OCR process utilized accounts for and corrects for potential OCR errors. In one embodiment, an election dictionary is provided of the potential vote choices. Thus, for example, candidate names may be entered into the election dictionary and utilized for pattern matching to the OCR results. To further, ensure accuracy (and address candidates that have the same or similar names) additional information beyond just the candidate name be utilized for comparison to the election dictionary. Thus, in one embodiment, the OCR'ed name and additional data may be utilized together as the key into the election dictionary. The additional data may be data related to a candidate, but being more than just the candidate name. For example, in some embodiments, the additional data may be the sequence number data affiliated with a candidate. The additional data may also be line number data affiliated with a contest, and/or the contest name itself. Thus, for example, the OCR'ed name and sequence number, the OCR'ed name and line number, or the OCR'ed name, sequence number and line number may be utilized together as the key into the election dictionary. It will be recognized that other combinations of a candidate name and additional data may also be used.

[0024] In addition a long string matching algorithm may be utilized to provide error detection to the string. In one embodiment, the Levenshtein distance algorithm may be utilized for such string error detection. More specifically, the Levenshtein algorithm is used for error detection and the calculation of a "distance" between the OCR data and each key in the dictionary. If a calculated distance is below a defined threshold, then the data is matched to that dictionary entry. Then as described below, a hash check indicates if all of the matches were correct. In this manner, OCR data errors may be minimized and a more robust OCR result may be obtained and used for the subsequent generation of a cast vote record.

[0025] The scanned data for write-in candidates may be treated somewhat differently as the names of write-in candidates may not be available before the voting process for entry in an election dictionary to use in the OCR post-processing steps as described above. In one embodiment, write-in data may be saved in two parts as part of the cast vote record. First, a PNG snippet of the entered write-in data (a photo "snapshot") may be stored as part of the cast vote record. Second, the OCR digital results of the write-in

data are also stored. Both parts may then be included in the cast vote record and uploaded for tabulation. When the election office processes write-in votes, the election office will have the digital OCR data side by side with the write-in image so that manual adjudication (if desired) may be accomplished. In one embodiment, further additional back office write-in candidate data verification may be accomplished if the election office generates a certified write-in candidate list. More particularly, the names from the certified write-in candidate list may be entered into the back office post-processing computer systems and then used in the same manner that the election dictionary described above is used to provide enhanced accuracy to the OCR results for write-in candidates.

[0026] Further, to ensure the PVR is valid and/or has not been altered after printing, a barcode is also provided on the PVR. The barcode includes a single digitally signed hash that may be generated using a secure hash function to indicate the PVR is valid and a one way hash of the voter's vote selections. As part of the scanning process, the optical character recognition results may be generated and then verified by use of another hash process. More specifically, a hash produced from the OCR generated characters may be compared to the hash provided in the barcode. Such techniques confirm that the PVR was printed from a known source and that the PVR has not been altered from its original state. In this manner, a counterfeit PVR or a PVR that has had its characters altered may be detected. Moreover, if the PVR was improperly or tampered with when printed, this technique can detect such tampering. It is noted that the barcode is used to confirm data accuracy and PVR integrity but, in one embodiment does not have to be used to determine voter selections. The barcode could be any of a wide range of barcode types, including for example, one dimensional barcodes or a matrix two-dimensional barcode (such as for example a QR code). Further, though described as one barcode, it will be recognized that the barcode may be split across multiple barcodes as well. For example, each barcode could serve as a landmark and the found barcode positions could be used to correct for scanning skew.

[0027] An exemplary PVR provided by the BMD 100 of Figure 2 is shown in Figure 3. As shown in Figure 3, a PVR 300 is provided. The PVR may include a header region 310 in which a variety of information may be printed. In one example, the header region 310

may include instructions to the voter, information regarding the election, a PVR number, page information, etc. As shown, in one embodiment a barcode 320 may be provided in the header region. In the example shown, the barcode is in the form of a QR code; however, other barcodes may be utilized. As described above, the barcode may be used to confirm data accuracy and/or PVR integrity but, in the exemplary embodiment, is not used to determine voter selections. The election voting contests may be shown in the contest section 330 of the PVR 300 as shown. Further, the voter's selections may be shown in the voter selection section 340 of the PVR 300 as shown. As seen in Figure 3, the voter selections are provided in a character form that is readable by the voter. Thus, voting transparency is provided to the voter such that the voter can confirm the PVR matches the selections entered by the voter on the BMD 100.

[0028] The contents of the barcode 320 may contain a wide variety of information including metadata content and hash data content. In one exemplary embodiment, the metadata content may include, but is not limited to a PVR barcode version, an election ID number, other unique ID numbers, an election version, precinct split sequence number, party sequence number, a crossover ballot flag, provisional ballot flag, official versus test ballot flag, accessibility settings, sheet number, sequence number of the first contest on the sheet, the number of lines on the sheet, etc. One use of the hash content is to ensure all voter selections were read correctly. Another use of the hash content is to verify the validity of the PVR itself. The hash may cover, in one embodiment, ballot metadata sections and all printed data in the voter selection section 340.

[0029] Thus, the barcode uses a single digitally signed hash that can be used for multiple purposes. First, the single digitally signed hash may be used to ensure the source origin of the PVR (that it came from the BMD 100), since it is a digital signature. In addition, the one way hash of voter selections provided in the barcode can be used to for a comparison to a hash of the OCR voter selections. The comparison of the one way hash of the barcode to the hash of OCR results can confirm that the PVR was not edited after printing. For example, if a voter's selection was edited on the PVR after printing from a first candidate name to a second candidate name, the OCR process would decode the second candidate name, but when hash checked, the first candidate name would have been utilized to create the barcode hash, and thus the hash check

would fail. In this manner, though the barcode contains a hash of the voter selection data, the barcode does not contain the original voter selection data itself.

[0030] Figure 4 illustrates one exemplary PVR processing workflow utilizing a PVR such as PVR 300 of Figure 3. It will be recognized that the workflow of Figure 4 is merely one exemplary workflow and many other workflows may utilize the techniques disclosed herein. As shown in the workflow of Figure 4, a scanned PVR is analyzed in accordance with the flow diagram of the workflow starting with a PVR scan and ending with either a rejected ballot or a cast or review of the ballot. As shown in Figure 4, the workflow starts with step 400 of starting a PVR scan. Next, at step 405 the barcode is decrypted and at step 405 it is determined if the decrypt succeeded. If the decryption was successful the workflow proceeds to step 415. If the decryption was not successful the workflow proceeds to step 420 where the workflow ends and the PVR is rejected. At step 515, the PVR is analyzed to determine if it is allowed. If the PVR is allowed the workflow proceeds to step 425 and if the PVR is not allowed, the workflow proceeds to step 420 where the workflow ends and the PVR is rejected. At step 425, the PVR is subjected to an OCR process. At step 430, the output of the OCR is analyzed to confirm it has a valid output (for example the correct number of lines, etc.). If no, the workflow proceeds to step 420 where the PVR is rejected. If yes, the workflow proceeds to step 435.

[0031] At step 435 the OCR data is matched to the ballot choices. Then at step 440 the hash is checked and if the hash matches at step 450 the workflow proceeds to step 460. If the hash does not match the process proceeds to step 455 where it is determined if there are still valid alternatives to try. If there are no valid alternatives to try, the workflow proceeds from step 455 to step 420 where the PVR is rejected. If there are valid alternatives to try at step 455, the workflow proceeds to step 440 it is determined if the number of contests with an alternate is under a threshold. If the answer is no at step 440, workflow to step 420 where the PVR is rejected. If the answer is yes at step 440, workflow proceeds to step 445 where alternates are swapped in. Workflow then proceeds again to step 440 and steps 440 and 450 are performed again as described above. At step 460, all write-in areas are snipped. From step 460, the process proceeds to step 465 to add OCR text to snippets and then the process ends at step 470 where the PVR is cast or reviewed.

[0032] It is noted that, as part of the workflow of Figure 4, a process step occurs that matches the OCR data to ballot choices, for example at step 435 of Figure 4. Details regarding this process step are shown in more detail in Figure 5. It will be recognized that the workflow of Figure 5 is merely one exemplary matching workflow and many other workflows may utilize the techniques disclosed herein. As shown in Figure 5, a process is shown for ballot choice matching for each OCR entry. As shown in step 500, the workflow of Figure 5 begins with an OCR entry. At step 505, the workflow concatenates the choice name and additional data (in this example a sequence number) and the value for each possible ballot choice to create comparison strings. Note, this may include “no selection” strings to account for the situation where no selection is made by the voter. Then at step 510, the process finds the comparison string with the lowest Levenshtein distance to the OCR string. Next at step 515, it is determined if the Levenshtein distance is under a threshold. If yes, the process proceeds to step 525. If no, the process proceeds to step 520 and the printed vote record is rejected. At step 525 it is determined if any other choices have the same distance. If no, the process proceeds to step 535. If yes, the process proceeds to step 530. At step 535 the choice provided is used and the process proceeds as shown in Figure 4 and described above. At step 530, the other choices are added to the valid alternatives list and the process then proceeds to step 535.

[0033] Thus, as described herein, a PVR is provided that is readable by a voter. Further, the readable text is utilized to generate an electronic cast vote. By being readable, full voter verification of a voter’s vote selections is provided in a format that provides transparency to the voting process. An OCR process is performed on the PVR and the output of the OCR process is further processed in order to ensure data integrity and reliability. In one embodiment, an election dictionary is provided of the potential vote choices and the election dictionary and other data on the PVR is utilized to provide reliable matching of the OCR results with the proper ballot choice. A barcode and hash process may further be utilized to ensure PVR integrity and security. Thus, a voter’s choices are shown in text and OCR techniques are utilized while a barcode is utilized for PVR and choice verification. In this manner, a secure, reliable and transparent voting workflow is provided.

[0034] Further modifications and alternative embodiments of this invention will be apparent to those skilled in the art in view of this description. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the manner of carrying out the invention. It is to be understood that the forms and methods of the invention herein shown and described are to be taken as presently preferred embodiments. Equivalent techniques may be substituted for those illustrated and described herein and certain features of the invention may be utilized independently of the use of other features, all as would be apparent to one skilled in the art after having the benefit of this description of the invention.

What is claimed is:

1. A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
comparing the first data set and the second data set; and
providing a cast vote record which is to be a stored record of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast voter record having all of the voter's vote selections from the printed vote record.
2. The method of claim 1, wherein the encoded data includes at least one bar code.
3. The method of claim 2, wherein the bar code is a Quick Response (QR) code bar code.
4. The method of claim 1, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set.
5. The method of claim 4, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data.

6. The method of claim 4, wherein confirming the integrity of the printed vote record comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.
7. The method of claim 4, further comprising comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.
8. The method of claim 7, wherein the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an optical character recognition (OCR) process.
9. The method of claim 1, further comprising comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.
10. The method of claim 9, wherein the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an optical character recognition (OCR) process.
11. The method of claim 10, wherein the election dictionary contains at least one candidate name.
12. The method of claim 1, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection.
13. The method of claim 12, wherein the data which is used to map the bar code to at least one particular vote selection is hash data.
14. The method of claim 12, wherein the bar code data of the bar code maps to the at least one particular vote selection through the use of a hash.

15. The method of claim 1, wherein the comparison of the first data set and the second data set is used to confirm an integrity of the printed vote record by confirming that the at least one vote selection that the first data set is based at least in part on matches the at least one vote selection that the second data set is based at least in part on.

16. The method of claim 1, further comprising utilizing an election dictionary as part of providing a cast vote record, wherein the election dictionary includes at least a candidate name and other data affiliated with candidate name.

17. The method of claim 16, wherein the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

18. The method of claim 1, wherein the comparing the first data set and the second data set is performed before generating any cast vote record which is to be the stored record of the voter's final vote selection and which is to be the voter's casted vote used for vote tabulation.

19. The method of claim 18, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set.

20. The method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data.

21. The method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.

22. The method of claim 18, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection.

23. The method of claim 22, wherein the data which is used to map the bar code to at least one particular vote selection is hash data.

24. The method of claim 22, wherein the bar code data of the bar code maps to the at least one particular vote selection through the use of a hash.

25. The method of claim 18, wherein the comparison of the first data set and the second data set is used to confirm an integrity of the printed vote record by confirming that the at least one vote selection that the first data set is based at least in part on matches the at least one vote selection that the second data set is based at least in part on.

26. The method of claim 18, further comprising utilizing an election dictionary as part of providing a cast vote record, wherein the election dictionary includes at least a candidate name and other data affiliated with candidate name.

27. The method of claim 26, wherein the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

28. A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;

providing, on the printed vote record, encoded data based at least in part on the voter's at least one vote selection;

electronically scanning the voter readable text on the printed vote record;

generating a first data set from the voter readable text using optical character recognition (OCR) and a comparison to an election dictionary, the first data set based at least in part on the voter's at least one vote selection;

electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection; and

providing a cast vote record indicating the voter's at least one vote selection based on the first data set,

wherein generating the first data set further comprises generating an OCR string from the voter readable text, and comparing the OCR string to at least one comparison string, and wherein the comparison string comprises a concatenation of data from the election dictionary including at least a part of a candidate's name and additional data.

29. The method of claim 28, further comprising comparing the first data set and the second data set, wherein the comparing the first data set and the second data set is performed before generating the cast vote record, the cast vote record being used for vote tabulation purposes prior to vote auditing..

30. The method of claim 29, wherein the cast vote record is the sole cast vote record to be casted indicating the voter's vote choices.

31. The method of claim 28, wherein the additional data comprises one or more of the following: sequence number data affiliated with the candidate, line number data affiliated with a contest, and a name of the contest.

32. The method of claim 28, wherein generating the first data set further comprises identifying a plurality of comparison strings having a similar or identical Levenshtein distance relative to the OCR string.

33. The method of claim 38, wherein generating the first data set further comprises generating an OCR hash from application of OCR to the voter readable text, and comparing the OCR hash to an encoded hash extracted from the encoded data on the printed vote record.

34. The method of claim 33, wherein generating the first data set further comprises recursively modifying an OCR process applied to the voter readable text and generating an additional OCR hash for comparison to the encoded hash until the additional OCR hash matches the encoded hash.

35. The method of claim 34, wherein recursively modifying an OCR process applied to the voter readable text further comprises: in response to a mismatch between the OCR hash and the encoded hash, selecting a valid alternate OCR output based on the OCR process applied to the voter readable text.

36. The method of claim 35, wherein selecting a valid alternate OCR output further comprises identifying one or more alternate OCR outputs having a similar or identical Levenshtein distance relative to comparison data derived from the election dictionary.

37. The method of claim 36, wherein selecting a valid alternate OCR output further comprises comparing the Levenshtein distances for one or more OCR strings relative to a comparison string.

38. The method of claim 28, further comprising comparing the first data set and the second data set to confirm an integrity of the printed vote record.

39. The method of claim 38, wherein comparing the first data set and the second data set to confirm the integrity of the printed vote record further comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.

40. A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
comparing the first data set and the second data set; and
providing a cast vote record which is to be a record of all of the voter's final vote selections and which is used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast vote record being generated after the comparing the first data set and the second data set, the cast vote record being utilized for vote tabulation purposes before vote auditing..

41. The method of claim 40, wherein the comparing is performed prior to generating the any cast vote record which is cast for the voter.

42. A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;

providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;

providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;

electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;

electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;

comparing the first data set and the second data set; and

providing a cast vote record which is to be a retained record of the voter's final vote selections and which is to be the voter's sole casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set.

43. The method of claim 43, wherein the comparing is performed prior to generating the any cast vote record which is cast for the voter.

44. The method of claim 43, wherein the cast vote record is utilized for vote tabulation purposes before vote auditing.

ABSTRACT

An electronic voting system is described that utilizes printed vote records (PVRs) in which a voter's vote selections are recorded in voter readable characters. Optical character recognition (OCR) techniques may then be utilized to scan the PVR to record the voter's selections. The OCR data is then utilized to generate the cast vote record. Thus, the electronic voting system directly interprets the voter selections from the PVR just as the voter sees the data. In this manner "what you see is what you get" printed vote record data is provided for a voter's viewing and that same data is used to generate the cast vote record.

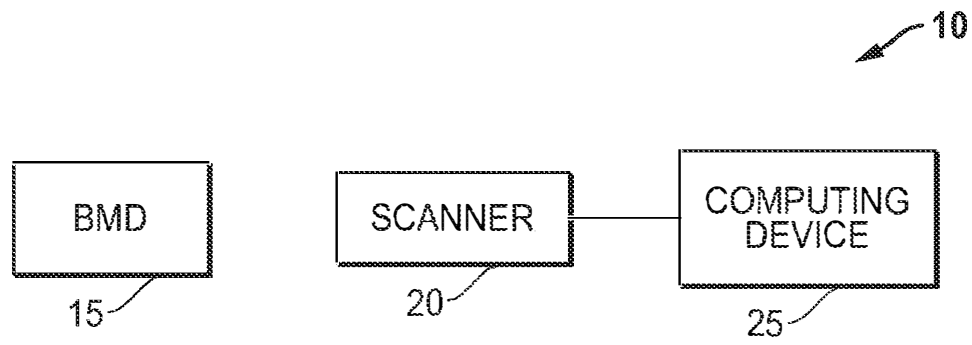


FIG. 1

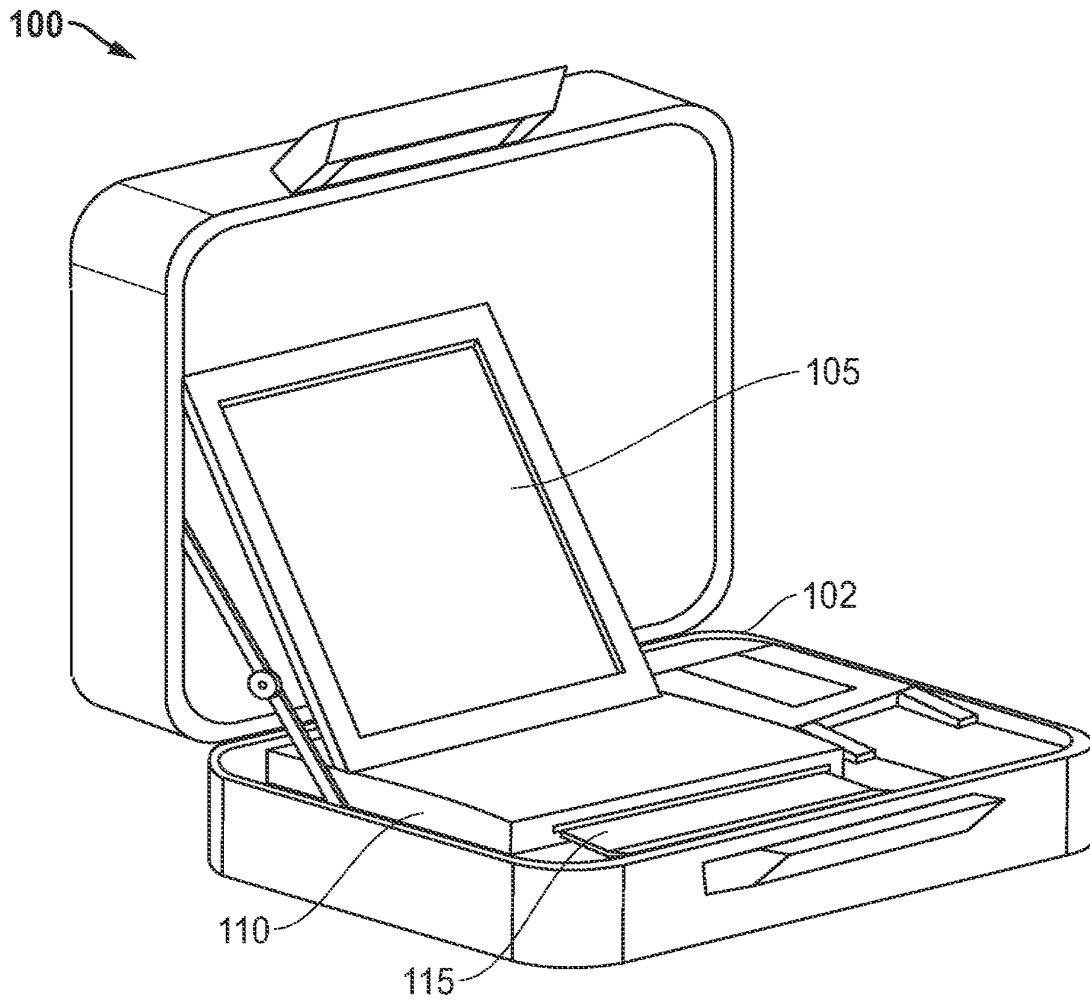
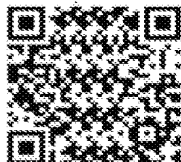


FIG. 2

320

300



OFFICIAL VOTE RECORD
 Additional custom header text
 PVR Title
 Joint General and Special Election
 Sample County, USA
 November 7, 2024 81234v07

Precinct: Anderson 1681-A
 PROVISIONAL
 045498-12-88EY
 23
 RC: 01e-x00b-0004
 Page 1 of 3

To cast your ballot, you must take this record to the separate scanning station and scan it.

310

340

	CHOICE	ORDER
President and Vice President	QUINLAN PHILLIPS	3 DEM
Senator	CAJ KLEMENTS	1 DEM
House of Representative District 6	NITIN STEVENS	5 DEM
Secretary of State	VIMAL ORIOL	22 DEM
Railroad Commissioner	KELEMEN ANGIOLI	2 DEM
State Senator	SALLIE UTKIN	4 DEM
State Legislator, District 124	SEBASTIJAN KAMAU	6 DEM
Governor	TEKLA ALFARSI	1 DEM
State Judge, 15th District	LASERBEAK ANDREASSEN	3 DEM
District Judge, 3rd District	ALEID MARTIN	165 DEM
Appeals Court Judge	FEDOT OKONKWO	7 DEM
Sample County Sheriff	*NO SELECTION*	
Sample County Tax Commissioner	MOTKE DOWNER	1 DEM
Sample County Water Supervisor	MARTZEL DANIEL	8 W-I
Sample County Chief Librarian	KENANIAH ARMSTRONG	2 DEM
Community College Director	ABRIEL BENTON	1 DEM
Community College Board Member S. 1	DALTON BROOK	6 DEM
Mayor of Sample City	KONAKU TESTA	9 DEM
City Oversight Board, Position 1	WAT JOKUMSEN	11 DEM
City Oversight Board, Position 2	TATE DOBOS	2 DEM
City Oversight Board, Position 3	KATIDA KLERX	4 DEM
City Oversight Board, Position 4	PHILE BAAS	12 DEM
City Oversight Board, Position 5	NAIARA CHAUDHRI	7 DEM
City Oversight Board, Position 6	LARKIN DONOHUE	1 DEM
City Oversight Board, Position 7	KAY PHILLIPS	3 DEM
City Oversight Board, Position 8	*NO SELECTION*	
Proposition 1	YES	1
Proposition 2	NO	2
Proposition 3	NO	2
Proposition 4	YES	1
School Board Member, Sample ISD	KUNTO MOSES	1 DEM
	2 (TWO) VOTES	
	ALDEGAR KRAEMER	5 DEM
	1 (ONE) VOTE	
	<SPACE>	
	<SPACE>	
Should TARA DOUGLASS be recalled?	NO	2
Candidates to replace TARA DOUGLASS	<NOT APPLICABLE>	
City Council	DENNY ABIODUN	21 DEM
	RANK 1 (ONE)	
	CONWAY BRIOSCHI	4 DEM
	RANK 2 (TWO)	
	FLANAGAN BEULEN	13 DEM
	RANK 3 (THREE)	
	END OF PAGE	

FIG. 3

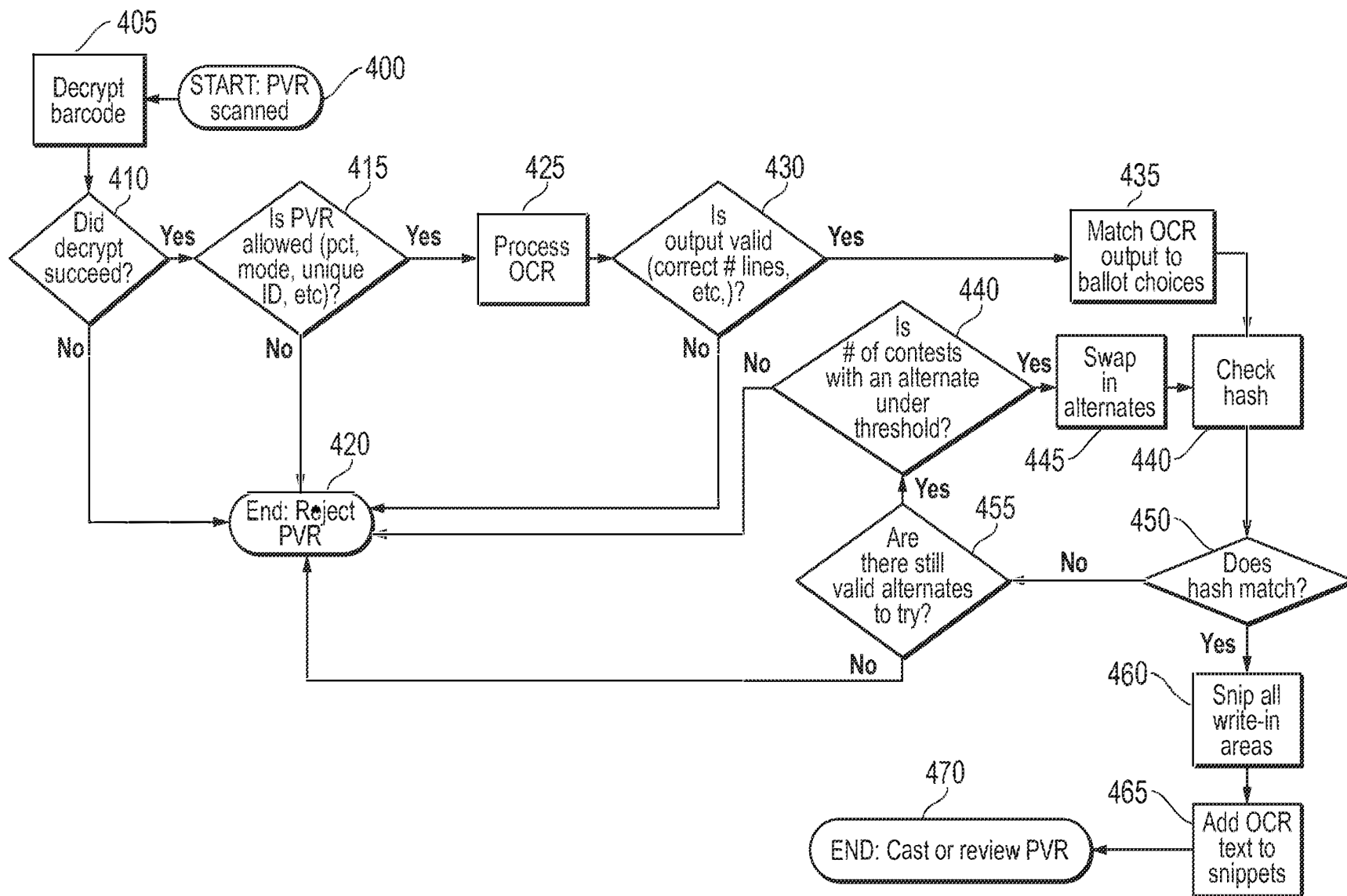


FIG. 4

4/4

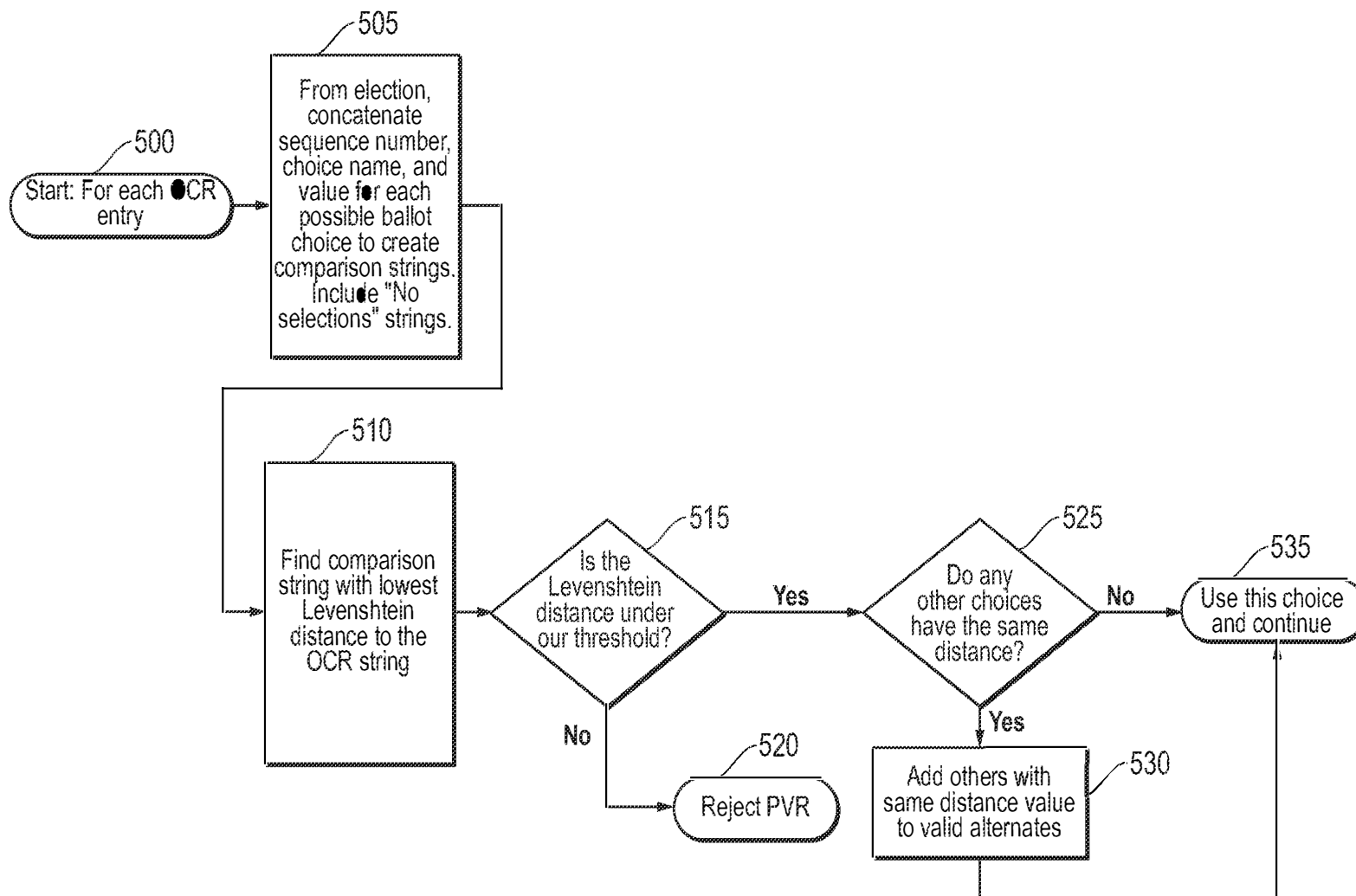


FIG. 5

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	2	5377099		1994-12-27	Miyagawa	
	3	6885758		2005-04-26	Bayer	
	4	5726435		1998-03-10	Hara et al.	
	5	2612994		1949-10-20	Woodland et al.	
	6	10147259		2018-12-04	Dvorak	
	7	10002481		2018-06-19	Seibel et al.	
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11	RE40449		2008-08-05	Provitola et al.	
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15	3609685		1971-09-28	Deutsch	
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26	10573111		2020-02-25	Canter et al.	
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30	10950078		2021-03-16	Canter et al.	

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	2	20090166417		2009-07-02	Dammann et al.	
	3	20060041468		2006-02-23	Reardon	
	4	20140012635		2014-01-09	Joyce et al.	
	5	20100114674		2010-05-06	Daza Fernandez et al.	
	6	20110202464		2011-08-18	Carbullido	
	7	20180102013		2018-04-12	Spanos et al.	
	8	20090289115		2009-11-26	Kevin Chung et al.	
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14	20050269406		2005-12-08	Andrew C. Neff	
15	20210225109		2021-07-22	Canter et al.	

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	2	2004038632	WO		2004-05-06	Boldin		
	3	1020130185582	BR		2014-09-02	Ronaldo Nadaf		

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19	Declaration Of Michael I. Shamos, Ph.D., J.D. Election Systems & Software, LLC. v. Hart InterCivic, Inc., Patent No. 10,445,966, 175 pgs.
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21	File History For Patent No. 10,445,966, 172 pgs.
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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

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Signature	/Richard D. Egan/	Date (YYYY-MM-DD)	2021-09-23
Name/Print	Richard D. Egan	Registration Number	36788

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	HART:032C6
		Application Number	
Title of Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor	1				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	James	M.	Canter		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Austin	State/Province	TX	Country of Residence	US
Mailing Address of Inventor:					
Address 1	10603 Winchelsea Drive				
Address 2					
City	Austin	State/Province	TX		
Postal Code	78750	Country i	US		
Inventor	2				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Drew	E.	Finney		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Austin	State/Province	TX	Country of Residence	US
Mailing Address of Inventor:					
Address 1	1501 Arcadia Avenue				
Address 2					
City	Austin	State/Province	TX		
Postal Code	78757	Country i	US		
Inventor	3				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Ievgen		Konovalenko		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	HART:032C6
		Application Number	
Title of Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records		

City	Austin	State/Province	TX	Country of Residence	US
Mailing Address of Inventor:					
Address 1	14302 Terisu Lane				
Address 2					
City	Austin	State/Province	TX		
Postal Code	78728	Country	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	36275		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records		
Attorney Docket Number	HART:032C6	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	Suggested Figure for Publication (if any)	4

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	HART:032C6
		Application Number	
Title of Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records		

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	36275		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending				Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
	Continuation of	17225357	2021-04-08		
Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
17225357	Continuation of	16919267	2020-07-02	11004292	2021-05-11
Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16919267	Continuation of	16745621	2020-01-17	10950078	2021-03-16
Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16745621	Continuation of	16560222	2019-09-04	10573111	2020-02-25
Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16560222	Continuation of	16239607	2019-01-04	10445966	2019-10-15

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	HART:032C6
		Application Number	
Title of Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records		
Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16239607	Claims benefit of provisional	62711212	2018-07-27
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ^j (if applicable)	Remove
Additional Foreign Priority Data may be generated within this form by selecting the Add button.				Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

☐ NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	HART:032C6
	Application Number	
Title of Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	HART:032C6
		Application Number	
Title of Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant	1	Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section. Clear		
☒ Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		
Name of the Deceased or Legally Incapacitated Inventor:		
If the Applicant is an Organization check here. ☒		
Organization Name	Hart InterCivic, Inc.	
Mailing Address Information For Applicant:		
Address 1	15550 Wells Port Drive	
Address 2		
City	Austin	State/Province TX
Country US	Postal Code	78728
Phone Number	Fax Number	
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. Add		

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	HART:032C6
		Application Number	
Title of Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records		

Assignee 1				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
Remove				
If the Assignee or Non-Applicant Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add				

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Richard D. Egan/		Date (YYYY-MM-DD)	2021-09-23
First Name	Richard D.	Last Name	Egan	Registration Number
				36788
Additional Signature may be generated within this form by selecting the Add button. Add				

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	HART:032C6
		Application Number	
Title of Invention	Optical Character Recognition Of Voter Selections For Cast Vote Records		

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	17483627
	Filing Date	2021-09-23
	First Named Inventor	JAMES M. CANTER
	Art Unit	
	Examiner Name	
	Attorney Docket Number	HART:032C6

U.S.PATENTS							Remove	
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Patent citation information please click the Add button.							Add	
U.S.PATENT APPLICATION PUBLICATIONS							Remove	
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	20160019439		2016-01-21	Wang			
If you wish to add additional U.S. Published Application citation information please click the Add button.							Add	
FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							
If you wish to add additional Foreign Patent Document citation information please click the Add button								Add
NON-PATENT LITERATURE DOCUMENTS								Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T ⁵

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17483627
Filing Date	2021-09-23
First Named Inventor	JAMES M. CANTER
Art Unit	
Examiner Name	
Attorney Docket Number	HART:032C6

1	
---	--

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

***EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17483627
Filing Date	2021-09-23
First Named Inventor	JAMES M. CANTER
Art Unit	
Examiner Name	
Attorney Docket Number	HART:032C6

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Richard D. Egan/	Date (YYYY-MM-DD)	2022-05-27
Name/Print	Richard D. Egan	Registration Number	36788

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/483,627	09/23/2021	James M. Canter	HART:032C6	3446
36275 7590 10/05/2022 Egan, Enders & Huston LLP. 1101 S. Capital of Texas Highway Bldg C, Suite 200 Austin, TX 78746			EXAMINER GUDORF, LAURA A	
			ART UNIT 2876	PAPER NUMBER
			NOTIFICATION DATE 10/05/2022	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 17/483,627	Applicant(s) Canter et al.	
	Examiner LAURA A GUDORF	Art Unit 2876	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09/23/2021.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1-44 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-44 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
Certified copies:
a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date 09/23/2021; 05/27/2022
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 4) ☐ Other: ____.

DETAILED ACTION

Summary

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

This is a first Office Action on the merits.

Claims 1-44 are currently pending.

Claim Objections

Claims 29, 33, 40, and 43 are objected to because of the following informalities:

In claim 29, please delete the second period at the end of the claim;

In claim 33, line 1, please amend "The method of claim 38" to recite "The method of claim 28";

In claim 40, please delete the second period at the end of the claim;

In claim 43, line 1, please amend "The method of claim 43" to recite "The method of claim 42";

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim(s) 1, 2, 4-5, 12, 15, 18-20, 22, 25, and 40-44 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of WANG et al, US 2016/0019439

Re claims 1, 4-5, 15, 40, 42, and 44:

BROCKHOUSE teaches a method for electronic voting using printed vote records, comprising:

Generating a printed vote record of at least one vote selection of a voter [0039] [0106] [Figure 6];

Providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection [0039] [0106] [Figure 6];

Providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection [0053] [Figure 6];

Electronically scanning the voter's readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection [0134];

Electronically scanning the encoded data on the printed vote record [0053] [Figure 6];

Generating a cast vote record, which is to be a stored record of all the voter's final vote selection and to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast vote record being utilized for vote tabulation purposes before vote auditing [0108] [0134];

BROCKHOUSE does not teach comparing the first data set to a second data set generation from electronically capturing second information from the printed vote record, wherein prior to generating any cast vote record which is to be a stored record of all of the voter's final vote selections, an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set.

WANG teaches a system configured to perform an OCR algorithm on an human readable text in an image and perform a data recognition algorithm on a barcode on the image [0066]-[0074]; the system compares the data extracted from the barcode to the data obtained from the OCR process to verify or correct the human readable text data [0024] [0074]-[0075] [0083].

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the aforementioned teachings of WANG in the method of BROCKHOUSE such that the OCR data is compared to encoded data obtained from barcodes printed on the cast vote record for the purpose of reducing and detecting potential errors. Further, while BROCKHOUSE and WANG do not explicitly state that the comparison is performed before generating any cast vote record is generated, it would have been obvious to one of ordinary skill in the art before the effective filing date for the comparison to occur before the cast vote record is generated to identify and correct errors before officially casting the voter's vote to prevent voting errors.

Re claim 2:

BROCKHOUSE, in view of WANG, teaches the method of claim 1 wherein the encoded data include at least one bar code [0053] [Figure 6].

Re claims 18-20, 25, 41, and 43:

BROCKHOUSE, in view of WANG, teaches the method of claims 1, 40, and 42, wherein the first data set and the second data are compared to verify and correct data errors, as discussed above. While BROCKHOUSE and WANG do not explicitly state that the comparison is performed before generating any cast vote record is generated, it would have been obvious to one of ordinary skill in the art before the effective filing date for the comparison to occur before the cast vote record is generated to identify and correct errors before officially casting the voter's vote to prevent voting errors.

Re claims 12 and 22:

BROCKHOUSE, in view of WANG, teaches the method of claims 1 and 18, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection [0053] [Figure 6].

Claim(s) 3 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of WANG et al, US 2016/0019439, as applied in claim 2, and further in view of NADAF, BR 2013018558.

Re claims 3:

BROCKHOUSE, in view of HEILPER, teaches the method of claim 2, but does not teach the barcode is a two-dimensional barcode, the two-dimensional barcode being a QR code.

NADAF teaches a printed vote record comprising a QR code encoding data based at least in part on a voter's at least one vote selection [Figure 4].

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the teachings of NADAF in the method of BROCKHOUSE, in view of HEILPER, such that the barcode is a QR code as QR codes are well known in the art to enable larger quantities of data to be encoded within a single code.

Claim(s) 6, 13, 14, 21, 23, and 24 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of WANG et al, US 2016/0019439, as applied in claims 4, 12, 19, and 22, HERSKOWITZ, US 6,971,574.

Re claims 6, 13, 14, 21, 23, and 24:

BROCKHOUSE, in view of WANG, teaches the method of claims 4 and 12, but does not teach confirming an integrity of the printed vote by comparing a first hash produced from the first data set to a second hash, wherein the second hash is at least part of the encoded data.

HERSKOWITZ teaches an electronic voting system which assigned confidential hash numbers to ballot choices (column 1, lines 44-48). The hash value is further encrypted to produce an encrypted hash total (EHT). The EHT is stored in memory and is further printed on the voter's receipt. The first hash (recorded hash) and the second hash (printed EHT) are provided on the printed vote record and compared to verify the integrity of the printed vote (column 2, lines 12-17).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the additional hash value procedures to further increase

the security of BROCKHOUSE's voting method by providing an additional way to verify the vote (column 2, line 12-17).

Claim(s) 7, 9, 16, and 26 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of WANG et al, US 2016/0019439, as applied in claims 1, 4, and 18, and further in view of SEBES et al, US 2019/0213820.

Re claims 7, 9, 16, and 26:

BROCKHOUSE, in view of WANG, teaches the method of claims 1, 4, and 18, but does not teach comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.

SEBES teaches an election definition containing at least potential vote choices, candidate names, and other data affiliated with candidate name [0073]-[0076]. OCR is used on a voter's marked ballot in order to identify the voter's at least one vote selection and the OCR results are compared to the text in the election definition [0287].

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the aforementioned teachings of SEBES in the method of BROCKHOUSE, in view of WANG, such that the first data set is compared to an election dictionary containing at least potential vote choices/candidate names for the purpose of confirming voter's selections are within the predefined selections in the election definition.

Claim(s) 8 and 10-11 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of WANG et al, US 2016/0019439 and SEBES et al, US 2019/0213820, as applied in claims 7 and 9, and further in view of HEILPER, US 7,406,201.

Re claims 8 and 10-11:

BROCKHOUSE, in view of WANG and SEBES, teaches the method of claims 7 and 9, but does not explicitly state that the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an OCR process.

HEILPER teaches generating a data set from human readable text using OCR and compares the data set to a dictionary for OCR error correction (column 3, lines 15-35; column 5, lines 10-22; Figure 2); wherein the comparing the first data set to a dictionary is utilized to confirm an accuracy of an OCR process (column 3, lines 15-35; column 5, lines 10-22; Figure 2); recursively modifying the first data set by: generating an OCR string from the text (column 5, lines 45-67); and calculating a distance between the OCR string and at least one comparison string (column 6, lines 36-48); further recursively modifying the first data set by identifying an alternative comparison string having distance below a defined threshold (column 6, lines 36-48; column 7, lines 1-45); wherein the distance is a Levenshtein distance (column 1, lines 26-41).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further information the teachings of HEILPER in the method of BROCKHOUSE such that the first data set is compared to a dictionary for the purpose of identifying and correcting OCR errors (column 5, lines 10-22).

Claim(s) 17 and 27 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of WANG et al, US 2016/0019439 and SEBES et al, US 2019/0213820, as applied in claim 26, and further in view of MORGANSTEIN, US 7,306,148.

Re claims 17 and 27:

BROCKHOUSE, in view of WANG and SEBES, teaches the method of claims 16 and 26, but does not explicitly state that the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

MORGANSTEIN teaches an election ballot comprising candidate names (82) and affiliated candidate sequence numbers (86) (column 14, lines 13-46; Figures 3a-3b).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the teachings of MORGANSTEIN in the method of BROCKHOUSE, in view of WANG and SEBES, such that the other data affiliated with the candidate name is a number indicative of a candidate sequence number. Incorporation of candidate sequence numbers on ballots is a well-known practice in the art and provides voter's with additional indicia to identify and select choices on the ballot (MORGANSTEIN (column 14, lines 13-46; Figures 3a-3b)).

Claim(s) 28 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of SEBES et al, US 2019/0213820 and SCANLON, US 5,850,480.

Re claim 28:

BROCKHOUSE teaches a method for electronic voting using printed vote records, comprising:

Generating a printed vote record of at least one vote selection of a voter [0039] [0106] [Figure 6];

Providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection [0039] [0106] [Figure 6];

Providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection [0053] [Figure 6];

Electronically scanning the voter's readable text on the printed vote record [0134];

Generating a first data set from the voter readable text using optical character recognition (OCR), the first data set based at least in part on the voter's at least one vote selection [0134];

Electronically scanning the encoded data on the printed vote record to create a data set, the data set based at least in part on the voter's at least one vote selection [0053] [Figure 6];

Providing a cast vote record indicating the voter's at least one vote selection based on the first data set [0108] [0134].

BROCKHOUSE does not teach generating the first data set further comprises generating an OCR string from the voter readable text, and comparing the OCR string to at least one comparison string, and wherein the comparison string comprises a

concatenation of data from the election dictionary including at least a part of a candidate's name and additional data.

SEBES teaches an election definition containing at least potential vote choices, candidate names, and other data affiliated with candidate name [0073]-[0076]. OCR is used on a voter's marked ballot in order to identify the voter's at least one vote selection and the OCR results are compared to the text in the election definition [0287].

SCANLON teaches a method of performing OCR errors correction of information written in multiple character fields or composite fields, the composite fields including any group of simple fields which are related in that there is a commonality of subject matter of the information contained within the fields (column 5, lines 38-43). A lexicon comprising composite lexicon strings, wherein each composite lexicon string consists of a plurality of lexicon sub-strings which are related in some way and associated with one another (column 5, line 56 – column 6, line 22; column 13, lines 44-67; column 14, lines 1-9). An OCR string is generated from human readable text compared to at least one comparison string, wherein the comparison string comprises a concatenation of data from the lexicon (column 14, lines 44-63; column 15, lines 36-61; column 26, lines 60-67; column 31, line 54- column 32, line 7; Figure 6A).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the aforementioned teachings of SEBES in the method of BROCKHOUSE such that the first data set is compared to an election dictionary containing at least potential vote choices/candidate names for the purpose of confirming voter's selections are within the predefined selections in the election definition.

It would have further been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the teachings of SCANLON in the method of BROCKHOUSE, in view of SEBES, such that the comparison string comprises a concatenation of data from the election dictionary for the purpose of enhancing accuracy of OCR results (SCANLON (column 3, lines 17-21; column 24, lines 49-60)).

Claim(s) 29-30, 32, and 38 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of SEBES et al, US 2019/0213820 and SCANLON, US 5,850,480, as applied in claim 28, and further in view of WANG et al, US 2016/0019439.

Re claims 29-30, 32, and 38:

BROCKHOUSE, in view of SEBES and SCANLON, teaches the method of claim 28, wherein the cast vote record is the sole cast vote record to be casted indicating the voter's vote choices [0108] [0134].

BROCKHOUSE does not teach comparing the first data set to a second data set generation from electronically capturing second information from the printed vote record, wherein prior to generating any cast vote record which is to be a stored record of all of the voter's final vote selections, an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set.

WANG teaches a system configured to perform an OCR algorithm on an human readable text in an image and perform a data recognition algorithm on a barcode on the image [0066]-[0074]; the system compares the data extracted from the barcode to the

data obtained from the OCR process to verify or correct the human readable text data [0024] [0074]-[0075] [0083].

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the aforementioned teachings of WANG in the method of BROCKHOUSE such that the OCR data is compared to encoded data obtained from barcodes printed on the cast vote record for the purpose of reducing and detecting potential errors.

Furthermore, while BROCKHOUSE and WANG do not explicitly state that the comparison is performed before generating any cast vote record is generated, it would have been obvious to one of ordinary skill in the art before the effective filing date for the comparison to occur before the cast vote record is generated to identify and correct errors before officially casting the voter's vote to prevent voting errors.

Claim(s) 31 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of SEBES et al, US 2019/0213820, SCANLON, US 5,850,480, and WANG et al, US 2016/0019439, as applied in claim 28, and further in view of MORGANSTEIN, US 7,306,148.

Re claim 31:

BROCKHOUSE, in view of SEBES, SCANLON, and WANG, teaches the method of claim 28, but does not explicitly state that the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

MORGANSTEIN teaches an election ballot comprising candidate names (82) and affiliated candidate sequence numbers (86) (column 14, lines 13-46; Figures 3a-3b).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the teachings of MORGANSTEIN in the method of BROCKHOUSE, in view of SEBES, SCANLON, and WANG, such that the other data affiliated with the candidate name is a number indicative of a candidate sequence number. Incorporation of candidate sequence numbers on ballots is a well-known practice in the art and provides voter's with additional indicia to identify and select choices on the ballot (MORGANSTEIN (column 14, lines 13-46; Figures 3a-3b)).

Claim(s) 33 and 39 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of SEBES et al, US 2019/0213820 and SCANLON, US 5,850,480, as applied in claim 28, and further in view of HERSKOWITZ, US 6,971,574.

Re claims 33 and 39:

BROCKHOUSE, in view of WANG, teaches the method of claims 28 and 38, but does not teach confirming an integrity of the printed vote by comparing a first hash produced from the first data set to a second hash, wherein the second hash is at least part of the encoded data.

HERSKOWITZ teaches an electronic voting system which assigned confidential hash numbers to ballot choices (column 1, lines 44-48). The hash value is further encrypted to produce an encrypted hash total (EHT). The EHT is stored in memory and

is further printed on the voter's receipt. The first hash (recorded hash) and the second hash (printed EHT) are provided on the printed vote record and compared to verify the integrity of the printed vote (column 2, lines 12-17).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the additional hash value procedures to further increase the security of BROCKHOUSE's voting method by providing an additional way to verify the vote (column 2, line 12-17).

Claim(s) 34-37 is/are rejected under 35 U.S.C. 103 as being unpatentable over BROCKHOUSE, US 2014/0231513 in view of SEBES et al, US 2019/0213820, SCANLON, US 5,850,480, and HERSKOWITZ, US 6,971,574, as applied in claim 33, and further in view of HEILPER, US 7,406,201.

Re claims 34-37:

BROCKHOUSE, in view of SEBES, SCANLON, and HERSKOWITZ, teaches the method of claim 33, but does not explicitly teach the recursive modification of an OCR process.

HEILPER teaches generating a data set from human readable text using OCR and compares the data set to a dictionary for OCR error correction (column 3, lines 15-35; column 5, lines 10-22; Figure 2); wherein the comparing the first data set to a dictionary is utilized to confirm an accuracy of an OCR process (column 3, lines 15-35; column 5, lines 10-22; Figure 2); recursively modifying the first data set by: generating an OCR string from the text (column 5, lines 45-67); and calculating a distance between the OCR string and at least one comparison string (column 6, lines 36-48); further

recursively modifying the first data set by identifying an alternative comparison string having distance below a defined threshold (column 6, lines 36-48; column 7, lines 1-45); wherein the distance is a Levenshtein distance (column 1, lines 26-41).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further information the teachings of HEILPER in the method of BROCKHOUSE such that the first data set is compared to a dictionary for the purpose of identifying and correcting OCR errors (column 5, lines 10-22).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAURA A GUDORF whose telephone number is (571)270-7607. If the Examiner cannot be reached by telephone, she can be reached through the following e-mail address: laura.gudorf@uspto.gov. The examiner can normally be reached on M-F 6:00-4:00 PM.

If attempts to reach the examiner by telephone and e-mail are unsuccessful, the examiner's supervisor, Michael Lee can be reached on (571)272-2398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/LAURA A GUDORF/
Primary Examiner, Art Unit 2876

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: JAMES M. CANTER ET AL.

Filed: SEPTEMBER 23, 2021

For: OPTICAL CHARACTER RECOGNITION OF VOTER SELECTIONS
FOR CAST VOTE RECORDS

Serial No.: 17/483,627

Group Art Unit: 2876

Examiner: GUDORF, L.

Atty Docket No.: HART:032C6

Electronically filed with the PTO

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

RESPONSE TO OFFICE ACTION DATED OCTOBER 5, 2022

This paper is submitted in response to the Office Action dated October 5, 2022.

A Request for Extension Of Time To Respond To Office Action dated October 5, 2022 is
being filed concurrently herewith.

Amendments to the Claims

Please amend Claims 29, 33, 40 and 43 as follows:

1. (Original) A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
comparing the first data set and the second data set; and
providing a cast vote record which is to be a stored record of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast voter record having all of the voter's vote selections from the printed vote record.
2. (Original) The method of claim 1, wherein the encoded data includes at least one bar code.
3. (Original) The method of claim 2, wherein the bar code is a Quick Response (QR) code bar code.

4. (Original) The method of claim 1, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set.
5. (Original) The method of claim 4, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data.
6. (Original) The method of claim 4, wherein confirming the integrity of the printed vote record comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.
7. (Original) The method of claim 4, further comprising comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.
8. (Original) The method of claim 7, wherein the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an optical character recognition (OCR) process.
9. (Original) The method of claim 1, further comprising comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.
10. (Original) The method of claim 9, wherein the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an optical character recognition (OCR) process.
11. (Original) The method of claim 10, wherein the election dictionary contains at least one candidate name.

12. (Original) The method of claim 1, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection.
13. (Original) The method of claim 12, wherein the data which is used to map the bar code to at least one particular vote selection is hash data.
14. (Original) The method of claim 12, wherein the bar code data of the bar code maps to the at least one particular vote selection through the use of a hash.
15. (Original) The method of claim 1, wherein the comparison of the first data set and the second data set is used to confirm an integrity of the printed vote record by confirming that the at least one vote selection that the first data set is based at least in part on matches the at least one vote selection that the second data set is based at least in part on.
16. (Original) The method of claim 1, further comprising utilizing an election dictionary as part of providing a cast vote record, wherein the election dictionary includes at least a candidate name and other data affiliated with candidate name.
17. (Original) The method of claim 16, wherein the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.
18. (Original) The method of claim 1, wherein the comparing the first data set and the second data set is performed before generating any cast vote record which is to be the stored record of the voter's final vote selection and which is to be the voter's casted vote used for vote tabulation.

19. (Original) The method of claim 18, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set.
20. (Original) The method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data.
21. (Original) The method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.
22. (Original) The method of claim 18, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection.
23. (Original) The method of claim 22, wherein the data which is used to map the bar code to at least one particular vote selection is hash data.
24. (Original) The method of claim 22, wherein the bar code data of the bar code maps to the at least one particular vote selection through the use of a hash.
25. (Original) The method of claim 18, wherein the comparison of the first data set and the second data set is used to confirm an integrity of the printed vote record by confirming that the at least one vote selection that the first data set is based at least in part on matches the at least one vote selection that the second data set is based at least in part on.
26. (Original) The method of claim 18, further comprising utilizing an election dictionary as part of providing a cast vote record, wherein the election dictionary includes at least a candidate name and other data affiliated with candidate name.

27. (Original) The method of claim 26, wherein the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

28. (Original) A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record;
generating a first data set from the voter readable text using optical character recognition (OCR) and a comparison to an election dictionary, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection; and
providing a cast vote record indicating the voter's at least one vote selection based on the first data set,
wherein generating the first data set further comprises generating an OCR string from the voter readable text, and comparing the OCR string to at least one comparison string, and wherein the comparison string comprises a concatenation of data from the election dictionary including at least a part of a candidate's name and additional data.

29. (Currently Amended) The method of claim 28, further comprising comparing the first data set and the second data set, wherein the comparing the first data set and the second data set is performed before generating the cast vote record, the cast vote record being used for vote tabulation purposes prior to vote auditing.[[.]]

30. (Original) The method of claim 29, wherein the cast vote record is the sole cast vote record to be casted indicating the voter's vote choices.

31. (Original) The method of claim 28, wherein the additional data comprises one or more of the following: sequence number data affiliated with the candidate, line number data affiliated with a contest, and a name of the contest.

32. (Original) The method of claim 28, wherein generating the first data set further comprises identifying a plurality of comparison strings having a similar or identical Levenshtein distance relative to the OCR string.

33. (Currently Amended) The method of claim ~~38~~ 29, wherein generating the first data set further comprises generating an OCR hash from application of OCR to the voter readable text, and comparing the OCR hash to an encoded hash extracted from the encoded data on the printed vote record.

34. (Original) The method of claim 33, wherein generating the first data set further comprises recursively modifying an OCR process applied to the voter readable text and generating an additional OCR hash for comparison to the encoded hash until the additional OCR hash matches the encoded hash.

35. (Original) The method of claim 34, wherein recursively modifying an OCR process applied to the voter readable text further comprises: in response to a mismatch between the OCR hash and the encoded hash, selecting a valid alternate OCR output based on the OCR process applied to the voter readable text.

36. (Original) The method of claim 35, wherein selecting a valid alternate OCR output further comprises identifying one or more alternate OCR outputs having a similar or identical Levenshtein distance relative to comparison data derived from the election dictionary.

37. (Original) The method of claim 36, wherein selecting a valid alternate OCR output further comprises comparing the Levenshtein distances for one or more OCR strings relative to a comparison string.

38. (Original) The method of claim 28, further comprising comparing the first data set and the second data set to confirm an integrity of the printed vote record.

39. (Original) The method of claim 38, wherein comparing the first data set and the second data set to confirm the integrity of the printed vote record further comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.

40. (Currently Amended) A method for electronic voting using printed vote records, comprising:

- generating a printed vote record of at least one vote selection of a voter;
- providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
- providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
- electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
- electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
- comparing the first data set and the second data set; and
- providing a cast vote record which is to be a record of all of the voter's final vote selections and which is used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast vote record being generated after the comparing the first

data set and the second data set, the cast vote record being utilized for vote tabulation purposes before vote auditing.[[.]]

41. (Original) The method of claim 40, wherein the comparing is performed prior to generating the any cast vote record which is cast for the voter.

42. (Original) A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
comparing the first data set and the second data set; and
providing a cast vote record which is to be a retained record of the voter's final vote selections and which is to be the voter's sole casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set.

43. (Currently Amended) The method of claim ~~43~~ 42, wherein the comparing is performed prior to generating the any cast vote record which is cast for the voter.

44. (Original) The method of claim 43, wherein the cast vote record is utilized for vote tabulation purposes before vote auditing.

REMARKS

Claims 1- 44 are currently pending. Claims 29, 33, 40 and 43 have been amended to address the claim objections due to informalities as noted in the Office Action.

Independent claims 1, 40, and 42 are rejected over a combination of Brockhouse in view of Wang. Independent claim 28 is rejected over Brockhouse in view of Sebes and Scanlon. As to claims 1, 40 and 42, it is respectfully asserted that even if combined, the teaches of Brockhouse and/or Wang do not teach the claimed invention. As to claim 28, it is respectfully asserted that Brockhouse fails to teach the subject matter asserted by the Office Action and thus even if combined, the combination fails to teach the claimed invention.

Brockhouse Distinction (Independent claims 1, 28, 40 and 42)

The Office Action points to Brockhouse for teaching a printed vote record that has both voter readable text and encoded data (the example in Brockhouse bar code encoded data). [Office Action pages 2-3]. The Office Action also points to Brockhouse for scanning the voter readable text and scanning the encoded data (bar code) to obtain voter's vote selections. [Office Action pages 2-3]. It is respectfully asserted that although Brockhouse provides a printed vote record and Brockhouse allows scanning of either the readable text or the bar code, Brockhouse never teaches scanning both the readable text and the bar code on the same printed vote record. Rather, the OCR scanning is explicitly stated to be "as an alternative to decoding the vote selection barcodes 112 to determine the corresponding vote selections." [Brockhouse paragraph 0134]

As claimed in each independent claim, the same printed vote record is subjected to both text and OCR scanning. The Office Action cites to Brockhouse for performing both of these steps on the same printed vote record. It is respectfully asserted that Brockhouse in no place teaches performing both types of scanning on the same printed vote record to create a first data set (from the OCR of text) and a second data set (from the encoded data), both data sets being "based at least in part on the voter's at least one vote selection." Brockhouse in fact teaches the opposite, only scanning one or the other of the text or bar code.

More particularly, Brockhouse teaches embedding voter selections in a barcode and then scanning that barcode. Brockhouse does teach that alternatively the vote selections may be obtained by using OCR of a printed vote card to determine the vote selections. Importantly, however, it is noted the barcodes and OCR are described as alternative ways to obtain the voter's selections in Brockhouse. Thus, for example, Brockhouse states that the voting stations of Brockhouse

...may use optical character recognition (OCR) to decode the vote selections 114 on the printed activation cards 20 as an alternative to decoding the vote selection barcodes 112 to determine the corresponding voting selections. If universal voting station 12 and tabulation device 14 are programmed to decode the vote selections 114 with OCR, universal voting station 12 may be programmed so that it does not print vote selection barcodes 112 on activation card 20.

[Brockhouse para. 0134] As noted in Brockhouse, OCR and barcodes are used as alternatives and not applied together to analyze one vote selection. Elsewhere, Brockhouse also teaches using OCR on write-in data, but again the OCR is an alternative to barcode and both barcode and OCR are never taught to be used together on the write-in vote. [*Id.* para 10109]

It is respectfully asserted that for this reason alone, even if the art asserted against the independent claims is combined, the combinations do not teach the claimed invention. As such, it is respectfully asserted that independent claims 1, 28, 40 and 42 (and all claims dependent therefrom) are patentable distinct from the asserted combinations.

Wang (Independent claims 1, 40 and 42)

The Office Action cites to Wang for teaching a system that compares data extracted from a barcode to data obtained from an OCR process to verify or correct the human readable text data. It is respectfully noted that Wang assumes that the data of the bar code is the accurate data and uses the bar code as the final determination of the data: "Data extracted from a barcode is typically more accurate than data extracted from alphanumeric." [Wang paragraph 0024]. Thus Wang uses the bar code data as the actually selected data. Thus, "If one or more of the digits do not match, the barcode digits are assumed to be correct and the alphanumeric characters are corrected accordingly." [Wang paragraph 0026] Similarly, it is noted elsewhere that the when

only a subset of digits match, the Wang identification code is determined to be the code “identified in the bar code.” [Wang paragraph 0082, See also Wang paragraph 0077]

Therefore, it is respectfully asserted that if Wang is combined with the Brockhouse for use with a printed vote record, Wang would teach utilizing the bar code data as the cast vote record. The claims, however, are in fact the opposite of Wang (note that the first data set is from the scanning of the voter readable text):

- Claims 1, 40 and 42: “the cast vote record indicating the voter’s at least one vote selection as determined by the first data set”

Thus, in Wang the data ultimately selected is the bar code data. In the present claims, however, the cast vote record is based upon the first data set (the scanned readable text).

It is respectfully asserted that for this additional reason alone related to Wang, the cited combinations fail to teach the limitations of independent claims 1, 40, and 42 (and all claims that depend therefrom).

Claim Objections:

Claims 29, 33, 40 and 43 have been objected to for informalities. The corrections recommended in the Office Action have been entered.

The fee for the request for extension of time is being paid concurrently herewith. Should any additional fees under 37 CFR 1.16-1.21 be required for any reason relating to the enclosed materials, the Commissioner is authorized to deduct such fees from Deposit Account No. 10-1205/HART:032C6. The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Respectfully submitted,

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/483,627	09/23/2021	James M. Canter	HART:032C6	3446
36275 7590 07/07/2023 Egan, Enders & Huston LLP. 1101 S. Capital of Texas Highway Bldg C, Suite 200 Austin, TX 78746			EXAMINER GUDORF, LAURA A	
			ART UNIT 2876	PAPER NUMBER
			NOTIFICATION DATE 07/07/2023	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

epehadmin@ipaustin.com
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Office Action Summary	Application No. 17/483,627	Applicant(s) Canter et al.	
	Examiner LAURA A GUDORF	Art Unit 2876	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04/04/2023.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1-44 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-44 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
Certified copies:
a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) ☐ Notice of References Cited (PTO-892) | 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____ |
| 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____ | 4) ☐ Other: _____ |

DETAILED ACTION

Summary

This Office Action is responsive to Applicant submission filed 04/04/2023.

Claims 1-44 are currently pending.

Response to Arguments

Applicant's arguments, see pages 10-11, filed 04/04/2023, with respect to the rejection(s) of claim(s) 1-44 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of NADAF, BR102013018558.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.

(a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

Claim(s) 1-5, 12, 18-20, 22, and 40-44 is/are rejected under 35 U.S.C.

102(a)(1) and 102(a)(2) as being anticipated by NADAF, BR 102013018558.

Re claims 1, 18, and 40-44:

NADAF teaches a method for electronic voting using printed vote records, comprising:

Generating a printed vote record of at least one vote selection of a voter (page 14, lines 7-9);

Providing, on the printed vote record, a voter readable text indicating the voter's at least one vote selection (page 14, lines 10-14);

Providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection (page 14, lines 10-14);

Electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection (page 15, lines 1-8; page 19, lines 7-12);

Electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection (page 15, line 1-8; page 18, lines 4-11; page 19, lines 7-12);

Comparing the first data set and the second data set (page 15, lines 1-8; page 19, lines 7-12); and

Providing a cast vote record which is to be a stored record of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast voter record having all of the voter's selections from the printed vote record (page 19); wherein the cast vote record provides the voter's sole casted vote used for vote tabulation (i.e., the record that is stored after the comparison of the OCR data and the barcode data is considered to be the voter's sole casted vote, as the

record is the only one used in tabulation of the vote (page 19)); wherein the cast vote record is a record of all vote selections made by a voter and is used for vote tabulation before auditing of voting (i.e., examiner considers “auditing of voting” to mean the audit of votes that have been tabulated. NADAF’s comparison of the text vote information to the vote information encoded into the barcode is performed before the vote has been tabulated (page 19). As such, the cast vote record of NADAF is “used for vote tabulation before auditing of voting”).

Re claims 2-3:

NADAF teaches the method of claim 1, wherein the encoded data includes at least one bar code, the barcode is a QR code (Figure 4).

Re claim 4:

NADAF teaches the method of claim 1, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set (page 19).

Re claim 5:

NADAF teaches the method of claim 4, wherein confirming the integrity of the printed vote record comprising comparing the first data set to information provided in the encoded data (page 19).

Re claims 12 and 22:

NADAF teaches the method of claims 1 and 18, wherein the encoded date includes at least one barcode, barcode data of the barcode including data which is used to map the barcode to at least one particular vote selection (page 14).

Re claim 19:

NADAF teaches the method of claim 18, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set (page 19).

Re claim 20:

NADAF teaches the method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data (page 19).

Claim(s) 6, 13, 14, 21, 23, and 24 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF in view of HERSKOWITZ, US 6,971,574.

Re claims 6, 13, 14, 21, 23, and 24:

NADAF teaches the method of claims 4 and 12, but does not teach confirming an integrity of the printed vote by comparing a first hash produced from the first data set to a second hash, wherein the second hash is at least part of the encoded data.

HERSKOWITZ teaches an electronic voting system which assigned confidential hash numbers to ballot choices (column 1, lines 44-48). The hash value is further encrypted to produce an encrypted hash total (EHT). The EHT is stored in memory and is further printed on the voter's receipt. The first hash (recorded hash) and the second hash (printed EHT) are provided on the printed vote record and compared to verify the integrity of the printed vote (column 2, lines 12-17).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the additional hash value procedures to further increase

the security of NADAF's voting method by providing an additional way to verify the vote (column 2, line 12-17).

Claim(s) 15 and 25 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF and further in view of WANG et al, US 2016/0019439.

Re claims 15 and 25:

NADAF teaches the method of claims 1 and 18, wherein the comparison of the first data set and the second data set is used to confirm the voter's at least one vote selection.

NADAF does not explicitly state the comparison confirms a match between at least one vote selection of the first data set and the at least one vote selection of the second data set.

WANG teaches a system configured to perform an OCR algorithm on human readable text in an image and perform a data recognition algorithm on a barcode of the image [0066]-[0074]. The system compares the data extracted from the barcode to the data obtained from the OCR process to verify or correct the human readable text data [0024] [0074]-[0075] [0083]. The comparison confirms accuracy of the OCR process by confirming that the obtained by the OCR process matches the data obtained from the extracted barcode [0024]-[0026] [0074] [0075] [0083].

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the teachings of WANG in the method of NADAF such that the comparison confirms a match between the first data set and the second data set. Requiring a match between the two sets insures accuracy of data extracted from

the OCR process and facilitates correction of the OCR data when the data sets do not match (WANG [0024] [0026] [0083]).

Claim(s) 7, 9, 16, and 26 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF in view of SEBES et al, US 2019/0213820.

Re claims 7, 9, 16, and 26:

NADAF teaches the method of claims 1, 4, and 18, but does not teach comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.

SEBES teaches an election definition containing at least potential vote choices, candidate names, and other data affiliated with candidate name [0073]-[0076]. OCR is used on a voter's marked ballot in order to identify the voter's at least one vote selection and the OCR results are compared to the text in the election definition [0287].

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the aforementioned teachings of SEBES in the method of NADAF, in view of WANG, such that the first data set is compared to an election dictionary containing at least potential vote choices/candidate names for the purpose of confirming voter's selections are within the predefined selections in the election definition.

Claim(s) 8 and 10-11 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF in view of SEBES et al, US 2019/0213820, as applied in claims 7 and 9, and further in view of HEILPER, US 7,406,201.

Re claims 8 and 10-11:

NADAF, in view of SEBES, teaches the method of claims 7 and 9, but does not explicitly state that the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an OCR process.

HEILPER teaches generating a data set from human readable text using OCR and compares the data set to a dictionary for OCR error correction (column 3, lines 15-35; column 5, lines 10-22; Figure 2); wherein the comparing the first data set to a dictionary is utilized to confirm an accuracy of an OCR process (column 3, lines 15-35; column 5, lines 10-22; Figure 2); recursively modifying the first data set by: generating an OCR string from the text (column 5, lines 45-67); and calculating a distance between the OCR string and at least one comparison string (column 6, lines 36-48); further recursively modifying the first data set by identifying an alternative comparison string having distance below a defined threshold (column 6, lines 36-48; column 7, lines 1-45); wherein the distance is a Levenshtein distance (column 1, lines 26-41).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further information the teachings of HEILPER in the method of NADAF, in view of SEBES, such that the first data set is compared to a dictionary for the purpose of identifying and correcting OCR errors (column 5, lines 10-22).

Claim(s) 17 and 27 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF in view of SEBES et al, US 2019/0213820, as applied in claims 16 and 26, and further in view of MORGANSTEIN, US 7,306,148.

Re claims 17 and 27:

NADAF, in view of SEBES, teaches the method of claims 16 and 26, but does not explicitly state that the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

MORGANSTEIN teaches an election ballot comprising candidate names (82) and affiliated candidate sequence numbers (86) (column 14, lines 13-46; Figures 3a-3b).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the teachings of MORGANSTEIN in the method of NADAF, in view of SEBES, such that the other data affiliated with the candidate name is a number indicative of a candidate sequence number. Incorporation of candidate sequence numbers on ballots is a well-known practice in the art and provides voter's with additional indicia to identify and select choices on the ballot (MORGANSTEIN (column 14, lines 13-46; Figures 3a-3b)).

Claim(s) 28-30 and 38 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF, BR 102013018558 in view of SEBES et al, US 2019/0213820 and SCANLON, US 5,850,480.

Re claims 28-30:

NADAF teaches a method for electronic voting using printed vote records, comprising:

Generating a printed vote record of at least one vote selection of a voter (page 14, lines 7-9);

Providing, on the printed vote record, a voter readable text indicating the voter's at least one vote selection (page 14, lines 10-14);

Providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection (page 14, lines 10-14);

Electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection (page 15, lines 1-8; page 19, lines 7-12);

Electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection (page 15, line 1-8; page 18, lines 4-11; page 19, lines 7-12);

Comparing the first data set and the second data set (page 15, lines 1-8; page 19, lines 7-12); and

Providing a cast vote record which is to be a stored record of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast voter record having all of the voter's selections from the printed vote record (page 19); wherein the cast vote record provides the voter's sole casted vote used for vote tabulation (i.e., the record that is stored after the comparison of the OCR data and the barcode data is considered to be the voter's sole casted vote, as the record is the only one used in tabulation of the vote (page 19)); wherein the cast vote record is a record of all vote selections made by a voter and is used for vote tabulation before auditing of voting (i.e., examiner considers "auditing of voting" to mean the audit of votes that have been tabulated. NADAF's comparison of the text vote information to

the vote information encoded into the barcode is performed before the vote has been tabulated (page 19). As such, the cast vote record of NADAF is “used for vote tabulation before auditing of voting”).

NADAF does not teach generating the first data set further comprises generating an OCR string from the voter readable text, and comparing the OCR string to at least one comparison string, and wherein the comparison string comprises a concatenation of data from the election dictionary including at least a part of a candidate’s name and additional data.

SEBES teaches an election definition containing at least potential vote choices, candidate names, and other data affiliated with candidate name [0073]-[0076]. OCR is used on a voter’s marked ballot in order to identify the voter’s at least one vote selection and the OCR results are compared to the text in the election definition [0287].

SCANLON teaches a method of performing OCR errors correction of information written in multiple character fields or composite fields, the composite fields including any group of simple fields which are related in that there is a commonality of subject matter of the information contained within the fields (column 5, lines 38-43). A lexicon comprising composite lexicon strings, wherein each composite lexicon string consists of a plurality of lexicon sub-strings which are related in some way and associated with one another (column 5, line 56 – column 6, line 22; column 13, lines 44-67; column 14, lines 1-9). An OCR string is generated from human readable text compared to at least one comparison string, wherein the comparison string comprises a concatenation of data from the lexicon (column 14, lines 44-63; column 15, lines 36-61; column 26, lines 60-67; column 31, line 54- column 32, line 7; Figure 6A).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the aforementioned teachings of SEBES in the method of NADAF such that the first data set is compared to an election dictionary containing at least potential vote choices/candidate names for the purpose of confirming voter's selections are within the predefined selections in the election definition.

It would have further been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the teachings of SCANLON in the method of NADAF, in view of SEBES, such that the comparison string comprises a concatenation of data from the election dictionary for the purpose of enhancing accuracy of OCR results (SCANLON (column 3, lines 17-21; column 24, lines 49-60)).

Re claim 38:

NADAF, in view of SEBES and SCANLON, teaches the method of claim 28, further comprising comparing the first data set and the second data set to confirm an integrity of the printed vote record (page 19).

Claim(s) 31 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF, BR 102013018558 in view of SEBES et al, US 2019/0213820 and SCANLON, US 5,850,480, as applied in claim 28, and further in view of MORGANSTEIN, US 7,306,148.

Re claim 31:

NADAF, in view of SEBES, SCANLON, teaches the method of claim 28, but does not explicitly state that the other data affiliated with a candidate name is a number,

wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

MORGANSTEIN teaches an election ballot comprising candidate names (82) and affiliated candidate sequence numbers (86) (column 14, lines 13-46; Figures 3a-3b).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the teachings of MORGANSTEIN in the method of BROCKHOUSE, in view of SEBES, SCANLON, and WANG, such that the other data affiliated with the candidate name is a number indicative of a candidate sequence number. Incorporation of candidate sequence numbers on ballots is a well-known practice in the art and provides voter's with additional indicia to identify and select choices on the ballot (MORGANSTEIN (column 14, lines 13-46; Figures 3a-3b)).

Claim(s) 32 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF, BR 102013018558 in view of SEBES et al, US 2019/0213820, SCANLON, US 5,850,480, as applied in claim 28, and further in view of HEILPER, US 7,406,201.

Re claim 32:

NADAF, in view of SEBES and SCANLON, teaches the method of claim 28, but does not teach the generation of the first data set further comprises identifying a plurality of comparison strings having a similar or identical Levenshtein distance relative to the OCR string.

HEILPER teaches generating a data set from human readable text using OCR and compares the data set to a dictionary for OCR error correction (column 3, lines 15-35; column 5, lines 10-22; Figure 2); wherein the comparing the first data set to a dictionary is utilized to confirm an accuracy of an OCR process (column 3, lines 15-35; column 5, lines 10-22; Figure 2); recursively modifying the first data set by: generating an OCR string from the text (column 5, lines 45-67); and calculating a distance between the OCR string and at least one comparison string (column 6, lines 36-48); further recursively modifying the first data set by identifying an alternative comparison string having distance below a defined threshold (column 6, lines 36-48; column 7, lines 1-45); wherein the distance is a Levenshtein distance (column 1, lines 26-41).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further information the teachings of HEILPER in the method of NADAF such that the first data set is compared to a dictionary for the purpose of identifying and correcting OCR errors (column 5, lines 10-22).

Claim(s) 33 and 39 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF, BR 102013018558 in view of SEBES et al, US 2019/0213820 and SCANLON, US 5,850,480, as applied in claims 28 and 38, and further in view of HERSKOWITZ, US 6,971,574.

Re claims 33 and 39:

NADAF, in view of SEBES and SCANLON, teaches the method of claims 28 and 38, but does not teach confirming an integrity of the printed vote by comparing a first

hash produced from the first data set to a second hash, wherein the second hash is at least part of the encoded data.

HERSKOWITZ teaches an electronic voting system which assigned confidential hash numbers to ballot choices (column 1, lines 44-48). The hash value is further encrypted to produce an encrypted hash total (EHT). The EHT is stored in memory and is further printed on the voter's receipt. The first hash (recorded hash) and the second hash (printed EHT) are provided on the printed vote record and compared to verify the integrity of the printed vote (column 2, lines 12-17).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further incorporate the additional hash value procedures to further increase the security of NADAF's voting method by providing an additional way to verify the vote (column 2, line 12-17).

Claim(s) 34-37 is/are rejected under 35 U.S.C. 103 as being unpatentable over NADAF, BR 102013018558 in view of SEBES et al, US 2019/0213820, SCANLON, US 5,850,480, and HERSKOWITZ, US 6,971,574, as applied in claim 33, and further in view of HEILPER, US 7,406,201.

Re claims 34-37:

NADAF, in view of SEBES, SCANLON, and HERSKOWITZ, teaches the method of claim 33, but does not explicitly teach the recursive modification of an OCR process.

HEILPER teaches generating a data set from human readable text using OCR and compares the data set to a dictionary for OCR error correction (column 3, lines 15-35; column 5, lines 10-22; Figure 2); wherein the comparing the first data set to a

dictionary is utilized to confirm an accuracy of an OCR process (column 3, lines 15-35; column 5, lines 10-22; Figure 2); recursively modifying the first data set by: generating an OCR string from the text (column 5, lines 45-67); and calculating a distance between the OCR string and at least one comparison string (column 6, lines 36-48); further recursively modifying the first data set by identifying an alternative comparison string having distance below a defined threshold (column 6, lines 36-48; column 7, lines 1-45); wherein the distance is a Levenshtein distance (column 1, lines 26-41).

It would have been obvious to one of ordinary skill in the art before the effective filing date to further information the teachings of HEILPER in the method of NADAF such that the first data set is compared to a dictionary for the purpose of identifying and correcting OCR errors (column 5, lines 10-22).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAURA A GUDORF whose telephone number is (571)270-7607. If the Examiner cannot be reached by telephone, she can be reached through the following e-mail address: laura.gudorf@uspto.gov. The examiner can normally be reached on M-F 6:00-4:00 PM.

If attempts to reach the examiner by telephone and e-mail are unsuccessful, the examiner's supervisor, Michael Lee can be reached on (571)272-2398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/LAURA A GUDORF/
Primary Examiner, Art Unit 2876

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: JAMES M. CANTER ET AL.

Filed: SEPTEMBER 23, 2021

For: OPTICAL CHARACTER RECOGNITION OF VOTER SELECTIONS
FOR CAST VOTE RECORDS

Serial No.: 17/483,627

Group Art Unit: 2876

Examiner: GUDORF, L.

Atty Docket No.: HART:032C6

Electronically filed with the PTO

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

AMENDMENT AND RESPONSE TO OFFICE ACTION DATED JULY 7,
2023 AND EXAMINER INTERVIEW SUMMARY

This paper is submitted in response to the Office Action dated July 7, 2023.
This paper also provides an Interview Summary of an Examiner Interview held
August 31, 2023.

Amendments to the Claims

Please amend claims 28 and 40 as follows:

1. (Original) A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
comparing the first data set and the second data set; and
providing a cast vote record which is to be a stored record of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast voter record having all of the voter's vote selections from the printed vote record.
2. (Original) The method of claim 1, wherein the encoded data includes at least one bar code.
3. (Original) The method of claim 2, wherein the bar code is a Quick Response (QR) code bar code.

4. (Original) The method of claim 1, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set.
5. (Original) The method of claim 4, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data.
6. (Original) The method of claim 4, wherein confirming the integrity of the printed vote record comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.
7. (Original) The method of claim 4, further comprising comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.
8. (Original) The method of claim 7, wherein the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an optical character recognition (OCR) process.
9. (Original) The method of claim 1, further comprising comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.
10. (Original) The method of claim 9, wherein the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an optical character recognition (OCR) process.
11. (Original) The method of claim 10, wherein the election dictionary contains at least one candidate name.

12. (Original) The method of claim 1, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection.
13. (Original) The method of claim 12, wherein the data which is used to map the bar code to at least one particular vote selection is hash data.
14. (Original) The method of claim 12, wherein the bar code data of the bar code maps to the at least one particular vote selection through the use of a hash.
15. (Original) The method of claim 1, wherein the comparison of the first data set and the second data set is used to confirm an integrity of the printed vote record by confirming that the at least one vote selection that the first data set is based at least in part on matches the at least one vote selection that the second data set is based at least in part on.
16. (Original) The method of claim 1, further comprising utilizing an election dictionary as part of providing a cast vote record, wherein the election dictionary includes at least a candidate name and other data affiliated with candidate name.
17. (Original) The method of claim 16, wherein the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.
18. (Original) The method of claim 1, wherein the comparing the first data set and the second data set is performed before generating any cast vote record which is to be the stored record of the voter's final vote selection and which is to be the voter's casted vote used for vote tabulation.

19. (Original) The method of claim 18, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set.
20. (Original) The method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data.
21. (Original) The method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.
22. (Original) The method of claim 18, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection.
23. (Original) The method of claim 22, wherein the data which is used to map the bar code to at least one particular vote selection is hash data.
24. (Original) The method of claim 22, wherein the bar code data of the bar code maps to the at least one particular vote selection through the use of a hash.
25. (Original) The method of claim 18, wherein the comparison of the first data set and the second data set is used to confirm an integrity of the printed vote record by confirming that the at least one vote selection that the first data set is based at least in part on matches the at least one vote selection that the second data set is based at least in part on.
26. (Original) The method of claim 18, further comprising utilizing an election dictionary as part of providing a cast vote record, wherein the election dictionary includes at least a candidate name and other data affiliated with candidate name.

27. (Original) The method of claim 26, wherein the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

28. (Currently Amended) ~~A method for electronic voting using printed vote records, comprising~~ The method of claim 1,:

~~generating a printed vote record of at least one vote selection of a voter;~~
~~providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;~~
~~providing, on the printed vote record, encoded data based at least in part on the voter's at least one vote selection;~~
~~electronically scanning the voter readable text on the printed vote record;~~
wherein the electronically scanning the voter readable text on the printed vote record to create the first data set comprises generating a first data set
~~from the voter readable text~~ using optical character recognition (OCR) and a comparison to an election dictionary, and the first data set based at least in part on the voter's at least one vote selection;
~~electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection; and~~
~~providing a cast vote record indicating the voter's at least one vote selection based on the first data set;~~
wherein the electronically scanning the voter readable text on the printed vote record to create the first data set ~~generating the first data set~~ further comprises generating an OCR string from the voter readable text, and comparing the OCR string to at least one comparison string, and wherein the comparison string comprises a concatenation of data from the election dictionary including at least a part of a candidate's name and additional data.

29. (Previously Presented) The method of claim 28, further comprising comparing the first data set and the second data set, wherein the comparing the first data set and the second data set is performed before generating the cast vote record, the cast vote record being used for vote tabulation purposes prior to vote auditing.

30. (Original) The method of claim 29, wherein the cast vote record is the sole cast vote record to be casted indicating the voter's vote choices.

31. (Original) The method of claim 28, wherein the additional data comprises one or more of the following: sequence number data affiliated with the candidate, line number data affiliated with a contest, and a name of the contest.

32. (Original) The method of claim 28, wherein generating the first data set further comprises identifying a plurality of comparison strings having a similar or identical Levenshtein distance relative to the OCR string.

33. (Previously Presented) The method of claim 29, wherein generating the first data set further comprises generating an OCR hash from application of OCR to the voter readable text, and comparing the OCR hash to an encoded hash extracted from the encoded data on the printed vote record.

34. (Original) The method of claim 33, wherein generating the first data set further comprises recursively modifying an OCR process applied to the voter readable text and generating an additional OCR hash for comparison to the encoded hash until the additional OCR hash matches the encoded hash.

35. (Original) The method of claim 34, wherein recursively modifying an OCR process applied to the voter readable text further comprises: in response to a mismatch between the OCR hash and the encoded hash, selecting a valid alternate OCR output based on the OCR process applied to the voter readable text.

36. (Original) The method of claim 35, wherein selecting a valid alternate OCR output further comprises identifying one or more alternate OCR outputs having a similar or identical Levenshtein distance relative to comparison data derived from the election dictionary.

37. (Original) The method of claim 36, wherein selecting a valid alternate OCR output further comprises comparing the Levenshtein distances for one or more OCR strings relative to a comparison string.

38. (Original) The method of claim 28, further comprising comparing the first data set and the second data set to confirm an integrity of the printed vote record.

39. (Original) The method of claim 38, wherein comparing the first data set and the second data set to confirm the integrity of the printed vote record further comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.

40. (Currently Amended) A method for electronic voting using printed vote records, comprising:

- generating a printed vote record of at least one vote selection of a voter;
- providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
- providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
- electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
- electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;

comparing the first data set and the second data set; and
providing a cast vote record which is to be a record of all of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast vote record being generated after the comparing the first data set and the second data set, the cast vote record being utilized for vote tabulation purposes before vote auditing.

41. (Original) The method of claim 40, wherein the comparing is performed prior to generating the any cast vote record which is cast for the voter.

42. (Original) A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
comparing the first data set and the second data set; and
providing a cast vote record which is to be a retained record of the voter's final vote selections and which is to be the voter's sole casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set.

43. (Previously Presented) The method of claim 42, wherein the comparing is performed prior to generating the any cast vote record which is cast for the voter.
44. (Original) The method of claim 43, wherein the cast vote record is utilized for vote tabulation purposes before vote auditing.

REMARKS

Claims 1- 44 are currently pending. Claims 1, 40 and 42 are the sole independent claims (previously independent claim 28 has been amended to depend from claim 1). Independent claims 1, 40 and 42 are rejected under 35 USC 102 based on Nadaf (BR 102013018558).

It is respectfully submitted that the Office Action has misinterpreted Nadaf.

This Response is structured as: (1) summarizing at a high level key differences between Nadaf and independent claim 1, (2) briefly highlighting some of the aspects of the technology disclosed in the pending application, (3) providing a review of the Nadaf reference, (4) describing the distinctions between independent claim 1 and Nadaf, and (5) providing an examiner interview summary.

1. Summary of Nadaf Deficiencies

Nadaf provides a voting system with two main pieces of hardware described. Equipment 1 provides the equipment at which a voter votes and at which a cast vote record (CVR) is finalized and generated. This equipment provides the final CVR that reflects the voter's vote selections and such CVR is not changed. "After voting concludes," the paper verification ballots 14 generated from equipment 1 are taken to some "other area" for post vote auditing by equipment 19. Equipment 1 which generates the finalized CVR of the voter's vote selections contains *no* optical character recognition (OCR) capability.

In general, the independent claims describe the use of electronic scanning for creating the final CVR and providing the final CVR for use as the voter's casted vote used for vote tabulation. This final CVR is used for tabulating the vote selections of the users and is determined by the first data set (the text scan). In contrast, the final CVR that indicates the voter's vote selections of Nadaf and that

is used for vote tabulation is generated and finalized without the use of text scanning (OCR) and any OCR in Nadaf is merely described with regard to post-vote tabulation audit procedures. The disclosure of Nadaf only compares OCR data sets in the audit stage after the voter's final cast vote record is generated and tabulated.

2. The Disclosed Technology

The pending application covers unique advances in optical character recognition ("OCR") and error processing that allow electronic voting systems to interpret the voter-readable text (i.e., vote selections) on a printed ballot. This is in contrast with conventional systems that rely on bar codes to represent the vote selections on the ballots. One problem with such conventional systems is that voters cannot themselves verify the content of a bar code to ensure their vote is being accurately cast. Pending Application paragraph 0004. The Applicant's claimed inventions in the pending application allow voters to have more confidence that their vote is being accurately counted because the system uses OCR to interpret the same printed text that a voter reads on the ballot.

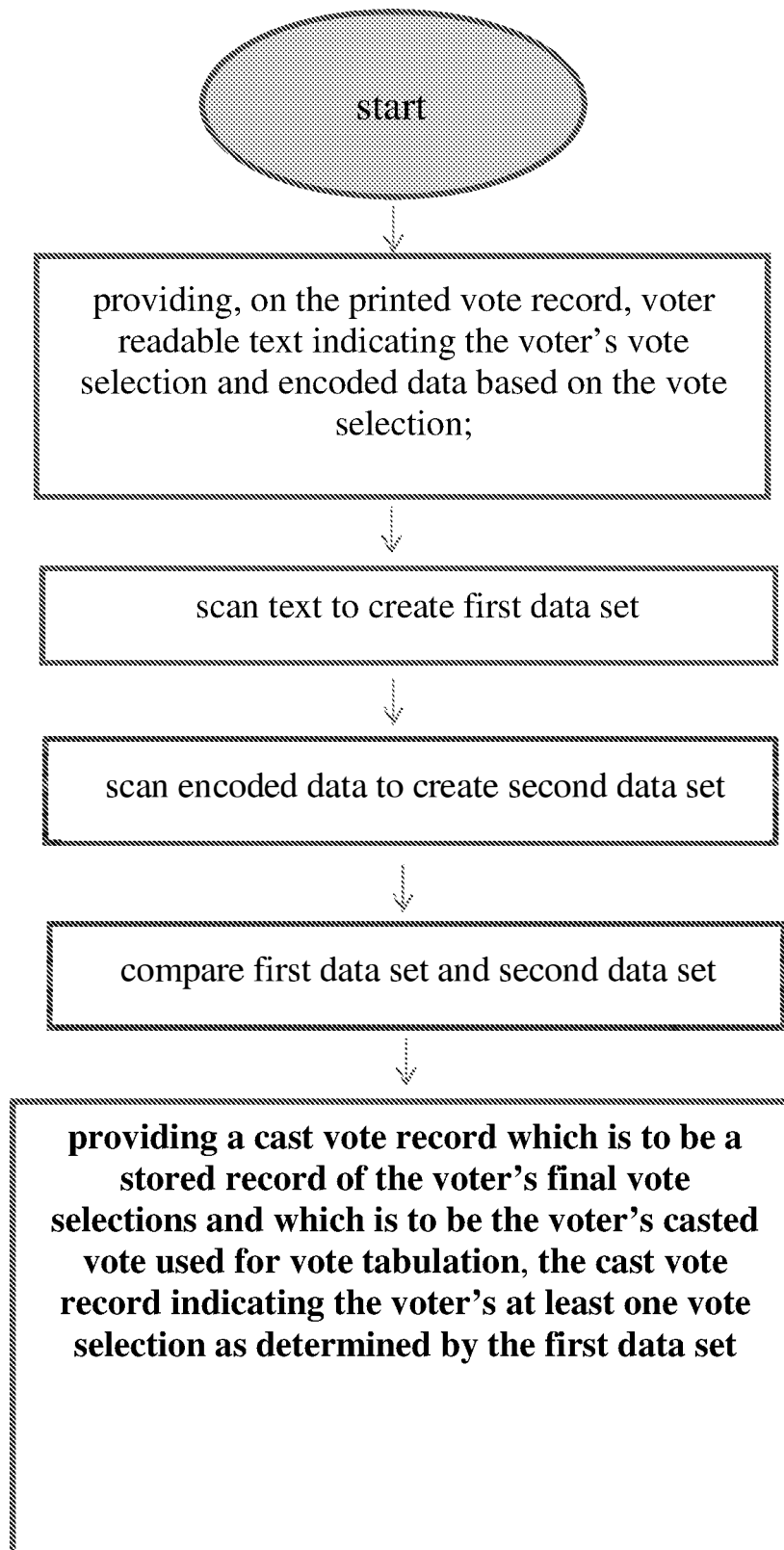
Using OCR in the CVR process of a voting system is difficult because voting systems must be able to process an extremely high volume of records with an extremely high accuracy rate. For example, the 2005 Voluntary Voting System Guidelines published by the U.S. Election Assistance Commission requires that "the voting system shall achieve a target error rate of no more than one in 10,000,000 ballot positions, with a maximum acceptable error rate in the test process of one in 500,000 ballot positions." Exhibit 1, p. 84. Indeed, as recently as April 2019, Election Systems & Software, LLC (the US market share leader in voting machines and the Petitioner in the Post Grant Review) asserted in a public

letter to sitting U.S. Senators that no voting system could “use OCR to read [a candidate’s name] and record a vote reliably[.]” Exhibit 2, p. 6.

Through specific technical improvements, the inventions of the pending application achieve the required accuracy to use OCR in an electronic voting system. One specific technique described in the pending application is comparing the OCR results to encoded information (for example a bar code) printed on the printed vote record. Pending application, paragraph 0026. In some examples (and in some claims of the pending application), the information in the encoded data / bar code may be a hash of the voter’s original vote selections, which may be checked against a hash of the OCR results. Comparing the OCR results with information encoded in the bar code allows the system to confirm that the OCR results are accurate. Another technique described in the pending application is the use of an election dictionary. *Id.* at paragraph 0023. An election dictionary can include specific information relevant to the election (such as a list of candidate names, as well as additional information like the name of the specific contest). Checking the results of the OCR against this specialized election dictionary can help detect and correct errors from the OCR process. It is these innovations that allow the use of OCR on voter-readable voter selections as part of the process of creating a cast vote record—thus providing the “what you see is what you get” advantages of the pending application’s inventions. As discussed below, these innovations are not found in the prior art.

A flow chart providing a high level summary (without all the claim limitations) of the steps of independent claim 1 is provided below as an example:

CLAIM 1

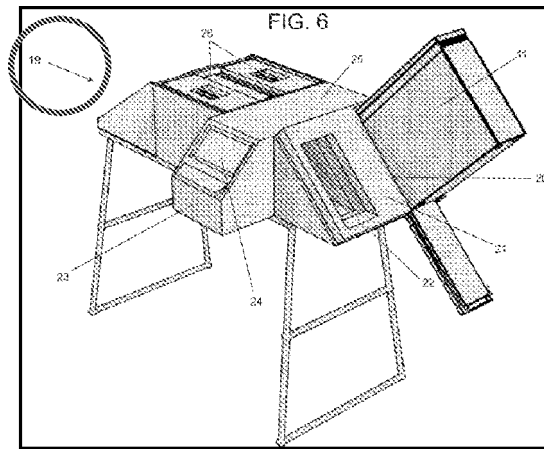
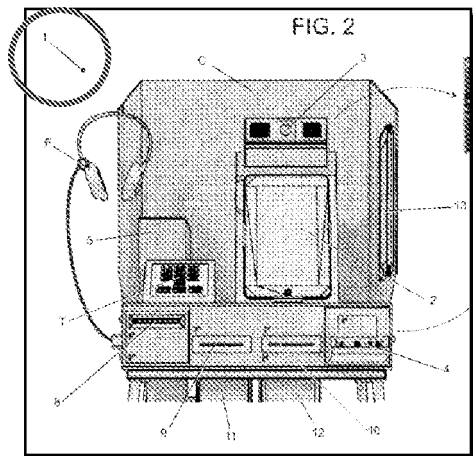


3. The Nadaf Reference

Nadaf is a Brazilian patent application. Consistent with normal voting practices in Brazil, Nadaf discloses an electronic voting system that generates a digital record of the voter's vote selections to effect the vote. Nadaf p. 15:13-15. ("Once the vote collection process is complete, the equipment (1) sends a digital signal to the electoral system to record the digital record of the vote[. . .][.] In this manner, the vote is counted in a normal manner."). Nadaf supplements the traditional direct-recording electronic (or "DRE") system to address concerns with the Brazilian electronic voting system. Nadaf p. 7:9-13 ("scientific research [. . .] increasingly points to the need for the voter [. . .] to be able to verify that their voting intention was recorded and counted correctly without running the risk of faults caused by errors, which unfortunately are present *in fully electronic voting.*" (emphasis added)). Nadaf seeks to address these concerns by having the electronic voting device also generate a printed record of the electronic vote. Nadaf pp. 10:10-19 and 14:7-9. However, the printed record is not counted as the formal, legal vote; it merely "provid[es] the voter with assurance of their choice and prevent[s] equipment failure from being able to change the vote cast digitally." Nadaf p. 10:18-11:1; Indeed, Nadaf emphasizes the historical problems with using paper ballots in Brazil to count votes. Nadaf p. 6:16-17 ("As is known historically, cultural trauma has been caused by the period during which the country conducted its elections on paper ballots.")

A critical aspect of Nadaf is its teaching that two distinct pieces of equipment are used for two distinct purposes. Nadaf p. 11:2-3. These are the "VERIFICATION BALLOT PRINTING AND COLLECTION EQUIPMENT" (equipment 1 in Figures 1, 2, and 3) and the "EQUIPMENT FOR AUDITING

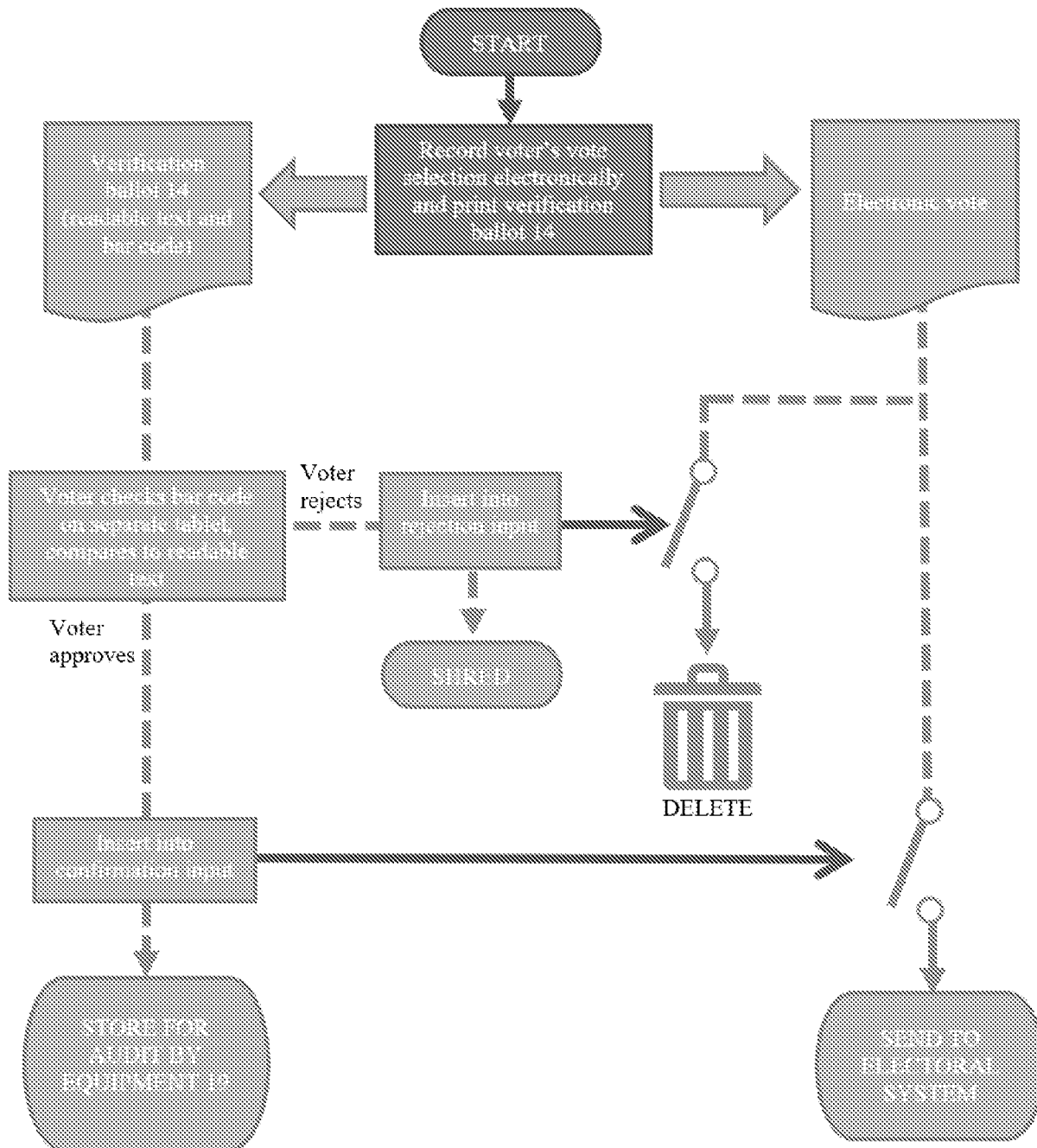
AND COUNTING VOTES PRINTED ON VERIFICATION BALLOTS”
(equipment 19 in Figures 5, 6, and 7):



Nadaf p.11:4-18, p.26, and p. 29. Equipment 1 is used by the voter to cast a *digital* vote. Nadaf p. 15:13-15. Equipment 19, by contrast, is used—only after voting is complete and in a separate area—to audit paper records of the vote. Nadaf p. 17:13-18:3.

a) Equipment 1 generates electronic votes and paper records

The actual voting in Nadaf is all electronic and is handled exclusively by equipment 1. See Nadaf p. 13:10-12. Below is a flow chart summarizing the operations of equipment 1 in Nadaf:



The purpose of equipment 1 in Nadaf is to securely generate both an electronic vote and a paper verification ballot that can be used in later audits. The voter inputs his or her selections into equipment 1, which generates an electronic vote based on these selections. Nadaf p. 13:18-14:6. “Once collection of the electronic vote is complete, the voter authorizes [. . .] the printing of a verification ballot (14)” by printer output 8, which is part of equipment 1. Nadaf p. 14:7-9. The verification ballot 14 includes a text printout of the vote, various bar codes that contain digital signatures, and another bar code 15 that contains a complete copy of the voter’s vote selection. Nadaf p. 14:10-19.

The voter evaluates verification ballot 14, including using a separate tablet to decode the bar code 15 containing the voter’s selections. Nadaf p. 15:1-6. If the voter visually determines that verification ballot and decoded bar code are accurate, then the voter inserts verification ballot 14 into input device 9 to confirm the ballot. Nadaf p. 15:4-5. Equipment 1 recognizes the inserted ballot by scanning a *different* bar code, not bar code 15, containing verification information. Nadaf p. 15:6-7. Equipment 1 does not, however, scan any voter-readable text. Equipment 1 then “sends a digital signal to the electoral system to record the digital record of the vote[.]” Nadaf p. 15:13-15. This digital record of the vote is based on the previously-recorded electronic voter selection, not based on the scan of the verification ballot. Alternatively, if the voter visually determines that the verification ballot or decoded bar code do not match the voter’s intended selections, then the voter inserts ballot 14 into input 10 to reject the ballot. Nadaf p. 15:16-16:2. Inserting the ballot 14 into input 10 causes equipment 1 “to cancel the digital vote and relaunch the voter identification process, returning the entire voting process to the initial stage.” Nadaf p. 16:5-6.

Thus, in Nadaf, the printed ballot has no role in *generating* a separate electronic record of an individual voter's vote selections (whether by OCR scan or otherwise). Rather, verification ballot 14 is used by equipment 1 merely to release or delete the *existing* electronic vote. Nadaf p. 15:4-16:6. Importantly, equipment 1 of Nadaf does not have OCR capability and "record[s] the digital record of the vote" without ever using OCR. Nadaf p. 15:4-16:6. In Nadaf, OCR is performed (if at all) only as part of *auditing* steps performed by equipment 19 after voting is complete. See Nadaf p. 18:9-11.

b) Equipment 19 audits and counts paper records

"After voting concludes," the paper verification ballots 14 in collection urn 11 of equipment 1 are taken to some "other area" for auditing and counting by equipment 19. Nadaf p. 17:13-18:3. As indicated by its name, equipment 19 has two main functions: auditing verification ballots 14 and counting verification ballots 14. See Nadaf p. 5:16-6:14.

After confirming the integrity of collection urn 11, equipment 19 scans the verification ballots 14 using optical reader 25. Nadaf p. 19:1-9. At this point, equipment 19 also "compar[es] the text vote information to the vote information encoded into the bar code." Nadaf p. 19:8-9. Following this "comparative audit," equipment 19 performs another step in which the printed vote is then counted electronically. Nadaf further states that equipment 19 will print "[r]eports, alerts and the total count bulletin [. . .] in text and two-dimensional bar code format;" these will also be retained "in the machine's print log." Nadaf p. 20:7-8.

Unlike equipment 1, equipment 19 does use OCR, but it does not generate anything that could qualify as a CVR with "which is to be a stored record of the voter's final vote selection and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection." (Claim 1). In fact, equipment 19 does not record any individual voter's vote

selections. It only provides a total, aggregate count of the previously created verification ballots 14, as a crosscheck on the original electronic voting.

4. **Elements of the independent claims that the Office Action relies on to be in Nadaf that are missing from Nadaf**

Independent Claim 1

The final limitation of independent claim 1 states:

“providing **a cast vote record** which is to be a stored record of the voter’s final vote selections and which is to be the voter’s casted vote used for vote tabulation, the cast vote record indicating the voter’s at least one vote selection as determined by the first data set, the cast voter record having all of the voter’s vote selections from the printed vote record.”

It is respectfully asserted that Nadaf provides no teaching of creating the CVR which is to be a stored record of the voter’s final vote selection and which is to be the voter’s casted vote used for vote tabulation **that is determined by the first data set** (the data set created using OCR text scanning). As discussed above, in Nadaf the CVR which is the final vote selection and is the voter’s casted vote used for vote selection of Nadaf is generated and finalized in Equipment 1. Text scanning and OCR plays no role in Equipment 1 and no role in the generation of the voter’s final recorded vote selection. It is noted that the Office Action cited Nadaf pages 15 lines 1-8 and 19 lines 7-12 for such limitations. However, it is respectfully noted that page 15 references equipment 1 and the only scan performed there is of the bar code. Nadaf p. 15:1-8. No OCR equipment is provided in equipment 1. As to the reference to page 19, that citation refers to Equipment 19 and the post vote auditing, a process done after the creation of the

CVR which is to be a stored record of the voter's final vote selection and which is to be the voter's casted vote. Equipment 19 does not provide, create, change or modify a CVR in any way which is to be a stored record of the voter's final vote selection and which is to be the voter's casted vote used for vote tabulation.

It is respectfully asserted that Nadaf does not teach the limitations of claim 1. Thus, claim 1 and dependent claims 2-39 are patentably distinct from the cited art.

Independent Claim 40

The final limitation of claim 40 is similar to that of claim 1:

“providing a cast vote record which is to be a record of all of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast vote record being generated after the comparing the first data set and the second data set, the cast vote record being utilized for vote tabulation purposes before vote auditing.”

The arguments presented above for claim 1 are equally applicable to the highlighted portions of claim 40. In addition, it is noted that claim 40 further states that the cast vote record is utilized for vote tabulation purposes before vote auditing. As noted above, the Nadaf vote tabulation process does not use OCR, only the audit process of Nadaf uses OCR. It is respectfully asserted that Nadaf does not teach the limitations of claim 40. Thus, claim 40 and dependent claim 41 are patentably distinct from the cited art.

Independent Claim 42

The final limitation of claim 42 is similar to that of claim 1:

“providing a cast vote record which is to be a retained record of the voter’s final vote selections and which is to be the voter’s sole casted vote used for vote tabulation, the cast vote record indicating the voter’s at least one vote selection as determined by the first data set.”

The arguments presented above for claim 1 are equally applicable to the highlighted portions of claim 42. It respectfully asserted that Nadaf does not teach the limitations of claim 42. Thus, claim 42 and dependent claims 43-44 are patentably distinct from the cited art.

5. Interview Summary

The applicant thanks Examiner Gudorf for conducting a telephonic interview with applicant’s counsel, Richard Egan, and co-inventor James Canter. The interview was conducted on August 31, 2023. The teachings of the disclosure of Nadaf were also discussed, specifically with reference to equipment 1 and equipment 19 of Nadaf and the different purposes of those equipment. Applicant’s counsel indicated that arguments for patentability of the claims in comparison to Nadaf would be more fully presented in the written Response.

CONCLUSION

Should any additional fees under 37 CFR 1.16-1.21 be required for any reason relating to the enclosed materials, the Commissioner is authorized to deduct such fees from Deposit Account No. 10-1205/HART:032C5. The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Respectfully submitted,

/Richard D. Egan/
Richard D. Egan
Registration No.: 36,788
Attorney for Applicant

EGAN, ENDERS & HUSTON, LLP
1101 South Capital of Texas Highway
Building C, Suite 200
Austin, Texas 78746
(512) 347-1611
FAX: (512) 347-1615



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/483,627	09/23/2021	James M. Canter	HART:032C6	3446
36275 7590 09/07/2023 Egan, Enders & Huston LLP. 1101 S. Capital of Texas Highway Bldg C, Suite 200 Austin, TX 78746			EXAMINER GUDORF, LAURA A	
			ART UNIT 2876	PAPER NUMBER
			NOTIFICATION DATE 09/07/2023	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

epehadmin@ipaustin.com
mjones@ipaustin.com
uspto@ockettrak.com

<i>Applicant-Initiated Interview Summary</i>	Application No. 17/483,627	Applicant(s) Canter et al.		
	Examiner LAURA A GUDORF	Art Unit 2876	AIA (First Inventor to File) Status Yes	Page 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	Title	Type
LAURA A GUDORF	Primary Examiner	Telephonic
Rich Egan	Attorney of Record	
Jim Canter	Inventor	

Date of Interview: 31 August 2023

Issues Discussed:

35 U.S.C. 102

Applicant and examiner discussed the differences between the prior art and the claimed invention. No agreement was reached.

☒ Attachment

/LAURA A GUDORF/ Primary Examiner, Art Unit 2876	
Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04 Please further see: MPEP 713.04 Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b) 37 CFR § 1.2 Business to be transacted in writing	

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.



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NOTICE OF ALLOWANCE AND FEE(S) DUE

36275 7590 09/13/2023
Egan, Enders & Huston LLP.
1101 S. Capital of Texas Highway
Building C, Suite 200
Austin, TX 78746

EXAMINER	
GUDORF, LAURA A	
ART UNIT	PAPER NUMBER
2876	

DATE MAILED: 09/13/2023

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/483,627	09/23/2021	James M. Canter	HART:032C6	3446

TITLE OF INVENTION: Optical Character Recognition Of Voter Selections For Cast Vote Records

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	12/13/2023

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

36275 7590 09/13/2023
Egan, Enders & Huston LLP.
1101 S. Capital of Texas Highway
Bldg C, Suite 200
Austin, TX 78746

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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17/483,627

09/23/2021

James M. Canter

HART:032C6

3446

TITLE OF INVENTION: Optical Character Recognition Of Voter Selections For Cast Vote Records

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional

UNDISCOUNTED

\$1200

\$0.00

\$0.00

\$1200

12/13/2023

EXAMINER	ART UNIT	CLASS-SUBCLASS
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GUDORF, LAURA A

2876

235-386000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via Patent Center or EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

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Date _____

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/483,627	09/23/2021	James M. Canter	HART:032C6	3446
36275	7590	09/13/2023	EXAMINER	
Egan, Enders & Huston LLP. 1101 S. Capital of Texas Highway Bldg C, Suite 200 Austin, TX 78746			GUDORF, LAURA A	
			ART UNIT	PAPER NUMBER
			2876	
DATE MAILED: 09/13/2023				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.** Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b) (2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 17/483,627	Applicant(s) Canter et al.	
	Examiner LAURA A GUDORF	Art Unit 2876	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendments filed 08/31/2023.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-44. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. ☐ Notice of References Cited (PTO-892) | 5. ☒ Examiner's Amendment/Comment |
| 2. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____. | 6. ☒ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material _____. | 7. ☐ Other _____. |
| 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date. _____. | |

/LAURA A GUDORF/
Primary Examiner, Art Unit 2876

DETAILED ACTION

Summary

This Office Action is responsive to Applicant submission filed 08/31/2023.

Claims 28 and 40 have been amended. Claims 1-44 are currently pending.

Response to Arguments

Applicant's arguments, see pages 11-22, filed 08/31/2023, with respect to the prior art have been fully considered and are persuasive. In particular, the examiner agrees with the applicant that the steps to provide the claimed cast vote record of the instant application are different than that of the cast vote record of NADAF. As such, the rejection of claims 1-44 has been withdrawn.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Claim 1 has been amended to correct typographical errors.

Claim 1:

A method for electronic voting using printed vote record, comprising each of the following limitations:

generating a printed vote record of at least one vote selection of a voter;

providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;

providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;

electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;

electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;

comparing the first data asset and the second data set; and

providing a cast vote record which is to be a stored record of the voter's final vote selection and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast ~~voter~~ vote record having all of the voter's vote selection from the printed vote record.

Allowable Subject Matter

Claims 1-44 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding independent claim 1:

The prior art of record fails to teach or fairly suggest, either singularly or in combination thereof, a method for electronic voting using printed vote record, comprising each of the following limitations:

Generating a printed vote record of at least one vote selection of a voter;

Providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;

Providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;

Electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;

Electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;

Comparing the first data asset and the second data set; and

*Providing a cast vote record which is to be a stored record of the voter's final vote selection and which is to be the voter's casted vote used for vote tabulation, **the cast vote record indicating the voter's at least one vote selection as determined by the first data set**, the cast vote record having all of the voter's vote selection from the printed vote record.*

Regarding independent claim 40:

The prior art of record fails to teach or fairly suggest, either singularly or in combination thereof, a method for electronic voting using printed vote record, comprising each of the following limitations:

generating a printed vote record of at least one vote selection of a voter;

providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;

providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;

electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;

electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;

comparing the first data set and the second data set; and

providing a cast vote record which is to be a record of all of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast vote record being generated after the comparing the first data set and the second data set, the cast vote record being utilized for vote tabulation purposes before vote auditing.

Regarding independent claim 42:

The prior art of record fails to teach or fairly suggest, either singularly or in combination thereof, a method for electronic voting using printed vote record, comprising each of the following limitations:

generating a printed vote record of at least one vote selection of a voter;

providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;

providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;

electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;

electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;

comparing the first data set and the second data set; and providing a cast vote record which is to be a retained record of the voter's final vote selections and which is to be the voter's sole casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set.

Claims 2-39, 41, 43, and 44 depend from claims 1, 40, and 42, respectively, and are therefore allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAURA A GUDORF whose telephone number is (571)270-7607. If the Examiner cannot be reached by telephone, she can be reached through the following e-mail address: laura.gudorf@uspto.gov. The examiner can normally be reached on M-F 6:00-4:00 PM.

If attempts to reach the examiner by telephone and e-mail are unsuccessful, the examiner's supervisor, Michael Lee can be reached on (571)272-2398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 17/483,627
Art Unit: 2876

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/LAURA A GUDORF/
Primary Examiner, Art Unit 2876

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: JAMES M. CANTER ET AL.

Filed: SEPTEMBER 23, 2021

For: OPTICAL CHARACTER RECOGNITION OF VOTER SELECTIONS
FOR CAST VOTE RECORDS

Serial No.: 17/483,627

Group Art Unit: 2876

Examiner: GUDORF, L.

Atty Docket No.: HART:032C6

Electronically filed with the PTO

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. §1.312

Please amend the application as follows to correct a typographical error.

Amendments to the Claims

Please amend claim 28 as follows:

1. (Original) A method for electronic voting using printed vote records, comprising:
generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
comparing the first data set and the second data set; and
providing a cast vote record which is to be a stored record of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast voter record having all of the voter's vote selections from the printed vote record.
2. (Original) The method of claim 1, wherein the encoded data includes at least one bar code.
3. (Original) The method of claim 2, wherein the bar code is a Quick Response (QR) code bar code.

4. (Original) The method of claim 1, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set.
5. (Original) The method of claim 4, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data.
6. (Original) The method of claim 4, wherein confirming the integrity of the printed vote record comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.
7. (Original) The method of claim 4, further comprising comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.
8. (Original) The method of claim 7, wherein the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an optical character recognition (OCR) process.
9. (Original) The method of claim 1, further comprising comparing the first data set to an election dictionary, the election dictionary containing at least potential vote choices.
10. (Original) The method of claim 9, wherein the comparing the first data set to an election dictionary is utilized to confirm an accuracy of an optical character recognition (OCR) process.
11. (Original) The method of claim 10, wherein the election dictionary contains at least one candidate name.

12. (Original) The method of claim 1, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection.
13. (Original) The method of claim 12, wherein the data which is used to map the bar code to at least one particular vote selection is hash data.
14. (Original) The method of claim 12, wherein the bar code data of the bar code maps to the at least one particular vote selection through the use of a hash.
15. (Original) The method of claim 1, wherein the comparison of the first data set and the second data set is used to confirm an integrity of the printed vote record by confirming that the at least one vote selection that the first data set is based at least in part on matches the at least one vote selection that the second data set is based at least in part on.
16. (Original) The method of claim 1, further comprising utilizing an election dictionary as part of providing a cast vote record, wherein the election dictionary includes at least a candidate name and other data affiliated with candidate name.
17. (Original) The method of claim 16, wherein the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.
18. (Original) The method of claim 1, wherein the comparing the first data set and the second data set is performed before generating any cast vote record which is to be the stored record of the voter's final vote selection and which is to be the voter's casted vote used for vote tabulation.

19. (Original) The method of claim 18, further comprising confirming an integrity of the printed vote record based at least in part on a comparison of the first data set and the second data set.
20. (Original) The method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing the first data set to information provided in the encoded data.
21. (Original) The method of claim 19, wherein confirming the integrity of the printed vote record comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.
22. (Original) The method of claim 18, wherein the encoded data includes at least one bar code, bar code data of the bar code including data which is used to map the bar code to at least one particular vote selection.
23. (Original) The method of claim 22, wherein the data which is used to map the bar code to at least one particular vote selection is hash data.
24. (Original) The method of claim 22, wherein the bar code data of the bar code maps to the at least one particular vote selection through the use of a hash.
25. (Original) The method of claim 18, wherein the comparison of the first data set and the second data set is used to confirm an integrity of the printed vote record by confirming that the at least one vote selection that the first data set is based at least in part on matches the at least one vote selection that the second data set is based at least in part on.
26. (Original) The method of claim 18, further comprising utilizing an election dictionary as part of providing a cast vote record, wherein the election dictionary includes at least a candidate name and other data affiliated with candidate name.

27. (Original) The method of claim 26, wherein the other data affiliated with a candidate name is a number, wherein the number is indicative of a line of the printed vote record or indicative of a candidate sequence number.

28. (Currently Amended) The method of claim 1,:
wherein the electronically scanning the voter readable text on the printed vote record to create the first data set comprises using optical character recognition (OCR) and a comparison to an election dictionary, and;
~~;~~and
wherein the electronically scanning the voter readable text on the printed vote record to create the first data set further comprises generating an OCR string from the voter readable text, and comparing the OCR string to at least one comparison string, and wherein the comparison string comprises a concatenation of data from the election dictionary including at least a part of a candidate's name and additional data.

29. (Previously Presented) The method of claim 28, further comprising comparing the first data set and the second data set, wherein the comparing the first data set and the second data set is performed before generating the cast vote record, the cast vote record being used for vote tabulation purposes prior to vote auditing.

30. (Original) The method of claim 29, wherein the cast vote record is the sole cast vote record to be casted indicating the voter's vote choices.

31. (Original) The method of claim 28, wherein the additional data comprises one or more of the following: sequence number data affiliated with the candidate, line number data affiliated with a contest, and a name of the contest.

32. (Original) The method of claim 28, wherein generating the first data set further comprises identifying a plurality of comparison strings having a similar or identical Levenshtein distance relative to the OCR string.

33. (Previously Presented) The method of claim 29, wherein generating the first data set further comprises generating an OCR hash from application of OCR to the voter readable text, and comparing the OCR hash to an encoded hash extracted from the encoded data on the printed vote record.

34. (Original) The method of claim 33, wherein generating the first data set further comprises recursively modifying an OCR process applied to the voter readable text and generating an additional OCR hash for comparison to the encoded hash until the additional OCR hash matches the encoded hash.

35. (Original) The method of claim 34, wherein recursively modifying an OCR process applied to the voter readable text further comprises: in response to a mismatch between the OCR hash and the encoded hash, selecting a valid alternate OCR output based on the OCR process applied to the voter readable text.

36. (Original) The method of claim 35, wherein selecting a valid alternate OCR output further comprises identifying one or more alternate OCR outputs having a similar or identical Levenshtein distance relative to comparison data derived from the election dictionary.

37. (Original) The method of claim 36, wherein selecting a valid alternate OCR output further comprises comparing the Levenshtein distances for one or more OCR strings relative to a comparison string.

38. (Original) The method of claim 28, further comprising comparing the first data set and the second data set to confirm an integrity of the printed vote record.

39. (Original) The method of claim 38, wherein comparing the first data set and the second data set to confirm the integrity of the printed vote record further comprises comparing a first hash produced from the first data set to a second hash provided in the encoded data.

40. (Previously Presented) A method for electronic voting using printed vote records, comprising:

- generating a printed vote record of at least one vote selection of a voter;
- providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
- providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
- electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
- electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
- comparing the first data set and the second data set; and
- providing a cast vote record which is to be a record of all of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set, the cast vote record being generated after the comparing the first data set and the second data set, the cast vote record being utilized for vote tabulation purposes before vote auditing.

41. (Original) The method of claim 40, wherein the comparing is performed prior to generating the any cast vote record which is cast for the voter.

42. (Original) A method for electronic voting using printed vote records, comprising:

generating a printed vote record of at least one vote selection of a voter;
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
providing, on the printed vote record, encoded data, the encoded data based at least in part on the voter's at least one vote selection;
electronically scanning the voter readable text on the printed vote record to create a first data set, the first data set based at least in part on the voter's at least one vote selection;
electronically scanning the encoded data on the printed vote record to create a second data set, the second data set based at least in part on the voter's at least one vote selection;
comparing the first data set and the second data set; and
providing a cast vote record which is to be a retained record of the voter's final vote selections and which is to be the voter's sole casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set.

43. (Previously Presented) The method of claim 42, wherein the comparing is performed prior to generating the any cast vote record which is cast for the voter.

44. (Original) The method of claim 43, wherein the cast vote record is utilized for vote tabulation purposes before vote auditing.

REMARKS

Claim 28 has been amended to correct a typographical error.

CONCLUSION

Should any additional fees under 37 CFR 1.16-1.21 be required for any reason relating to the enclosed materials, the Commissioner is authorized to deduct such fees from Deposit Account No. 10-1205/HART:032C6. The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Respectfully submitted,

/Richard D. Egan/
Richard D. Egan
Registration No.: 36,788
Attorney for Applicant

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