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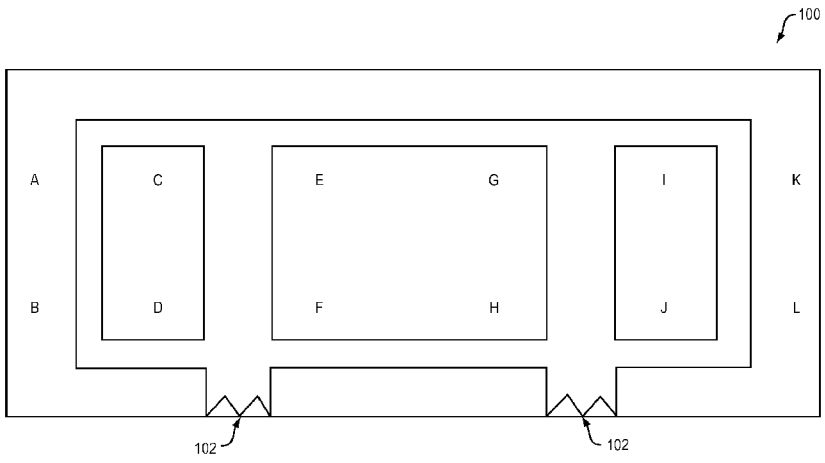

FIG. 1

(57) Abstract: Exemplary embodiments are directed to inventory and radio frequency identification (RFID) device management. As described herein, RFID tags and readers can be utilized to implement one or more processes for identifying misplaced or orphaned products, configuring mode of integration used the RFID readers, determining a location of the RFID readers, or any combination thereof.

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1. A computer-implemented method of managing inventory, comprising:

receiving, at an antenna operatively coupled to a radio-frequency identification (RFID) reader, product identification information encoded in an RF signal transmitted by a plurality of RFID tags, each of the plurality of RFID tags associated with a respective one of a plurality of products;

processing, by a processor, the product identification information contained in a portion of the encoded RF signal to identify a characteristic associated with each of the plurality of products; and

identifying, by the processor using the product identification information, a first of the plurality of products having a characteristic different from a second of the plurality of products.

2. The computer-implemented method of claim 1, wherein determining the characteristic includes retrieving, by the processor from a database, machine-readable product data representing the characteristic associated with the respective one of the plurality of products.

3. The computer-implemented method of claim 1, wherein the characteristic includes at least one of a product stock keeping unit (SKU) number, a manufacturer product number, a brand identifier, a model identifier, a product category, a department number, a package quantity, a pack type identifier, a style, a season, a size, and a color.

4. The computer-implemented method of claim 1, further comprising:

identifying, by the processor using the product identification information, a majority of the plurality of products having a characteristic in common; and

identifying at least one of the plurality of products having a characteristic different from the majority.

5. The computer-implemented method of claim 1, further comprising displaying, by the processor via a display, information representing the first of the plurality of products having the characteristic different from the second of the plurality of products.

6. The computer-implemented method of claim 5, wherein the product identification information includes at least one of a product stock keeping unit (SKU) number, a manufacturer product number, a brand identifier, a model identifier, and a product name.

7. The computer-implemented method of claim 1, wherein the product identification information is read over a predetermined period of time.

8. An inventory management system comprising:

a programmable processor; and

a memory operatively coupled to the processor, the memory having stored thereon computer-executable instructions that when executed by the processor cause the processor to:

receive, at an antenna operatively coupled to a radio-frequency identification (RFID) reader, product identification information encoded in an RF signal transmitted by a plurality of RFID tags, each of the plurality of RFID tags associated with a respective one of a plurality of products;

process the product identification information contained in a portion of the encoded RF signal to identify a characteristic associated with each of the plurality of products; and

identify, using the product identification information, a first of the plurality of products having a characteristic different from a second of the plurality of products.

9. The system of claim 8, wherein the memory further comprises instructions that when executed by the processor cause the processor to determine the characteristic by retrieving, from a database, machine-readable product data representing the characteristic associated with the respective one of the plurality of products.

10. The system of claim 8, wherein the characteristic includes at least one of a product stock keeping unit (SKU) number, a manufacturer product number, a brand identifier, a model identifier, a product category, a department number, a package quantity, a pack type identifier, a style, a season, a size, and a color.

11. The system of claim 8, wherein the memory further comprises instructions that when executed by the processor cause the processor to:

identify, using the product identification information, a majority of the plurality of products having a characteristic in common; and

identify at least one of the plurality of products having a characteristic different from the majority.

12. The system of claim 8, wherein the memory further comprises instructions that when executed by the processor cause the processor to display, via a display, information representing the first of the plurality of products having the characteristic different from the second of the plurality of products.

13. The system of claim 12, wherein the product identification information includes at least one of a product stock keeping unit (SKU) number, a manufacturer product number, a brand identifier, a model identifier, and a product name.

14. The system of claim 8, wherein the product identification information is read over a predetermined period of time.

15. A non-transitory computer-readable medium having stored thereon computer-executable instructions that when executed by a computer cause the computer to:

receive, at an antenna operatively coupled to a radio-frequency identification (RFID) reader, product identification information encoded in an RF signal transmitted by a plurality of RFID tags, each of the plurality of RFID tags associated with a respective one of a plurality of products;

process the product identification information contained in a portion of the encoded RF signal to identify a characteristic associated with each of the plurality of products; and

identify, using the product identification information, a first of the plurality of products having a characteristic different from a second of the plurality of products.

16. The non-transitory computer-readable medium of claim 15, wherein determining the characteristic includes retrieving, by the processor from a database, machine-readable product

data representing the characteristic associated with the respective one of the plurality of products.

17. The non-transitory computer-readable medium of claim 15, wherein the characteristic includes at least one of a product stock keeping unit (SKU) number, a manufacturer product number, a brand identifier, a model identifier, a product category, a department number, a package quantity, a package identifier, a style, a season, a size, and a color.

18. The non-transitory computer-readable medium of claim 15, further comprising instructions that when executed by the processor cause the processor to:

identify, using the product identification information, a majority of the plurality of products having a characteristic in common; and

identify at least one of the plurality of products having a characteristic different from the majority.

19. The non-transitory computer-readable medium of claim 15, further comprising instructions that when executed by the processor cause the processor to display, via a display, information representing the first of the plurality of products having the characteristic different from the second of the plurality of products.

20. The non-transitory computer-readable medium of claim 19, wherein the product identification information includes at least one of a product stock keeping unit (SKU) number, a manufacturer product number, a brand identifier, a model identifier, and a product name.

21. A computer-implemented method of managing inventory performed by a processor, comprising:

receiving in a digital or analog format, from a first computing device, a first request for first radio frequency identification (RFID) tag data associated with a first plurality of RFID tags;

receiving in a digital or analog format, from a second computing device, a second request for second RFID tag data associated with a second plurality of RFID tags;

in response to the first request and the second request, automatically selecting a selected one of a first interrogation mode and a second interrogation mode based on the first request and the second request; and

automatically transmitting configuration information to an RFID reader to operate in the selected one of the first interrogation mode and the second interrogation mode.

22. The computer-implemented method of claim 21, wherein the second plurality of RFID tags includes a portion of the first plurality of RFID tags, and wherein the second RFID tag data includes a portion of the first RFID tag data.

23. The computer-implemented method of claim 21, wherein operating in the selected one of the first interrogation mode and the second interrogation mode causes the RFID reader to read the first RFID tag data and the second RFID tag data using the fewest number of RFID tag read operations.

24. The computer-implemented method of claim 21, wherein operating in the selected one of the first interrogation mode and the second interrogation mode causes the RFID reader to read the first RFID tag data and the second RFID tag data in the least amount of time.

25. The computer-implemented method of claim 21, further comprising:

receiving the first RFID tag data from the first plurality of RFID tags via the RFID reader while the RFID reader is operating in the selected one of the first interrogation mode and the second interrogation mode;

receiving the second RFID tag data from the second plurality of RFID tags via the RFID reader while the RFID reader is operating in the selected one of the first interrogation mode and the second interrogation mode;

transmitting the first RFID tag data to the first computing device; and

transmitting the second RFID tag data to the second computing device.

26. The computer-implemented method of claim 21, wherein the selected one of the first interrogation mode and the second interrogation mode is automatically selected when the first request and the second request each include a request to receive RFID tag data via the RFID reader from a common subset of the plurality of RFID tags.

27. The computer-implemented method of claim 26, wherein the common subset of the plurality of RFID tags includes previously read ones of the plurality of RFID tags.

28. The computer-implemented method of claim 21, further comprising automatically configuring the RFID reader to operate in one of an Electronic Product Code (EPC) Gen2 standard-compatible session 0, 1, 2 and 3 and/or automatically configuring a pre-selection criterion filter of the RFID reader based on the selected one of the first interrogation mode and the second interrogation mode.

29. The computer-implemented method of claim 21, wherein the RFID reader is a first RFID reader, the method further comprising automatically transmitting configuration information to a second RFID reader to operate in an interrogation mode different than the selected one of the first interrogation mode and the second interrogation mode.

30. The computer-implemented method of claim 29, further comprising:

receiving the first RFID tag data from the first plurality of RFID tags via the first RFID reader while the first RFID reader is operating in the selected one of the first interrogation mode and the second interrogation mode; and

receiving the second RFID tag data from the second plurality of RFID tags via a second RFID reader while the second RFID reader is operating in the interrogation mode different than the selected one of the first interrogation mode and the second interrogation mode.

31. The computer-implemented method of claim 30, further comprising:

transmitting the first RFID tag data to the first computing device; and

transmitting the second RFID tag data to the second computing device.

32. An inventory management system comprising:

a programmable processor; and

a memory operatively coupled to the processor, the memory having stored thereon computer-executable instructions that when executed by the processor cause the processor to:

receive in a digital or analog format, from a first computing device, a first request for first radio frequency identification (RFID) tag data associated with a first plurality of RFID tags;

receive in a digital or analog format, from a second computing device, a second request for second RFID tag data associated with a second plurality of RFID tags;

in response to the first request and the second request, automatically select a selected one of a first interrogation mode and a second interrogation mode based on the first request and the second request; and

automatically transmit configuration information to an RFID reader to operate in the selected one of the first interrogation mode and the second interrogation mode.

33. The system of claim 32, wherein the second plurality of RFID tags includes a portion of the first plurality of RFID tags, and wherein the second RFID tag data includes a portion of the first RFID tag data.

34. The system of claim 32, wherein operating in the selected one of the first interrogation mode and the second interrogation mode causes the RFID reader to read the first RFID tag data and the second RFID tag data using the fewest number of RFID tag read operations.

35. The system of claim 32, wherein operating in the selected one of the first interrogation mode and the second interrogation mode causes the RFID reader to read the first RFID tag data and the second RFID tag data in the least amount of time.

36. The system of claim 32, wherein the memory further comprises instructions that when executed by the processor cause the processor to:

receive the first RFID tag data from the first plurality of RFID tags via the RFID reader while the RFID reader is operating in the selected one of the first interrogation mode and the second interrogation mode;

receive the second RFID tag data from the second plurality of RFID tags via the RFID reader while the RFID reader is operating in the selected one of the first interrogation mode and the second interrogation mode;

transmit the first RFID tag data to the first computing device; and

transmit the second RFID tag data to the second computing device.

37. The system of claim 32, wherein the selected one of the first interrogation mode and the second interrogation mode is automatically selected when the first request and the second request each include a request to receive RFID tag data via the RFID reader from a common subset of the plurality of RFID tags.

38. The system of claim 37, wherein the common subset of the plurality of RFID tags includes previously read ones of the plurality of RFID tags.

39. The system of claim 32, wherein the memory further comprises instructions that when executed by the processor cause the processor to automatically configure the RFID reader to operate in one of an Electronic Product Code (EPC) Gen2 standard-compatible session 0, 1, 2 and 3 and/or automatically configure a pre-selection criterion filter of the RFID reader based on the selected one of the first interrogation mode and the second interrogation mode.

40. A non-transitory computer-readable medium having stored thereon computer-executable instructions that when executed by a computer cause the computer to:

receive in a digital or analog format, from a first computing device, a first request for first radio frequency identification (RFID) tag data associated with a first plurality of RFID tags;

receive in a digital or analog format, from a second computing device, a second request for second RFID tag data associated with a second plurality of RFID tags;

in response to the first request and the second request, automatically select a selected one of a first interrogation mode and a second interrogation mode based on the first request and the second request; and

automatically transmit configuration information to an RFID reader to operate in the selected one of the first interrogation mode and the second interrogation mode.

41. The non-transitory computer-readable medium of claim 40, wherein operating in the selected one of the first interrogation mode and the second interrogation mode causes the RFID reader to read the first RFID tag data and the second RFID tag data using the fewest number of RFID tag read operations.

42. The non-transitory computer-readable medium of claim 40, further comprising instructions that when executed by the processor cause the processor to:

receive the first RFID tag data from the first plurality of RFID tags via the RFID reader while the RFID reader is operating in the selected one of the first interrogation mode and the second interrogation mode;

receive the second RFID tag data from the second plurality of RFID tags via the RFID reader while the RFID reader is operating in the selected one of the first interrogation mode and the second interrogation mode;

transmit the first RFID tag data to the first computing device; and

transmit the second RFID tag data to the second computing device.

43. A computer-implemented method of managing inventory, comprising:

receiving, at an antenna operatively coupled to a radio-frequency identification (RFID) reader, product identification information encoded in an RF signal transmitted by a plurality of RFID tags, each of the plurality of RFID tags associated with a respective one of a plurality of products; and

processing, by a processor and using the product identification information, information contained in a portion of the encoded RF signal to compare apparent location information associated with the RFID reader with prior location information associated with at least one of the plurality of products.

44. The computer-implemented method of claim 43, wherein comparing the apparent location information comprises retrieving, by the processor from a database, machine-readable product data representing the prior location information associated with each of the plurality of products.

45. The computer-implemented method of claim 44, further comprising updating, by the processor, the apparent location information to match the prior location information where the apparent location information is different than the prior location information.

46. The computer-implemented method of claim 45, wherein updating the apparent location information further comprises updating the apparent location information to match

the prior location information where the prior location information associated with a majority of the plurality of products is different from the apparent location information.

47. The computer-implemented method of claim 43, wherein the prior location information includes product location information associated with at least one of the plurality of products received on at least two different occasions prior to comparing the apparent location with the prior location information.

48. The computer-implemented method of claim 43, further comprising displaying, by the processor via a display, at least one of the prior location information and the apparent location information.

49. The computer-implemented method of claim 43, further comprising displaying, by the processor via a display, a prompt for a user to manually update the apparent location information to match the prior location information where the apparent location information is different than the prior location information.

50. The computer-implemented method of claim 43, wherein the prior location information and the apparent location information each represent at least one physical location.

51. The computer-implemented method of claim 50, further comprising displaying, by the processor via a display, information representing the at least one physical location.

52. The computer-implemented method of claim 43, wherein the product identification information is received while the physical location of the reader is substantially static.

53. The computer-implemented method of claim 43, wherein the product identification information is read over a predetermined period of time.

54. An inventory management system comprising:

a programmable processor; and

a memory operatively coupled to the processor, the memory having stored thereon computer-executable instructions that when executed by the processor cause the processor to:

receive, at an antenna operatively coupled to a radio-frequency identification (RFID) reader, product identification information encoded in an RF signal transmitted by a plurality of RFID tags, each of the plurality of RFID tags associated with a respective one of a plurality of products;

process, using the product identification information, information contained in a portion of the encoded RF signal to compare apparent location information associated with the RFID reader with prior location information associated with each of the plurality of products; and

update the apparent location information to match the prior location information where the apparent location information is different than the prior location information.

55. The system of claim 54, wherein the memory further comprises instructions that when executed by the processor cause the processor to compare the apparent location information by retrieving, from a database, machine-readable product data representing the prior location information associated with each of the plurality of products.

56. The system of claim 54, wherein the memory further comprises instructions that when executed by the processor cause the proc

essor to update the apparent location information to match the prior location information where the prior location information associated with a majority of the plurality of products is different from the apparent location information.

57. The system of claim 54, wherein the prior location information includes product location information associated with at least one of the plurality of products received on at least two different occasions prior to comparing the apparent location with the prior location information.

58. The system of claim 54, wherein the memory further comprises instructions that when executed by the processor cause the processor to display, via a display, at least one of the prior location information and the apparent location information.

59. The system of claim 54, wherein the prior location information and the apparent location information each represent at least one physical location.

60. The system of claim 59, wherein the memory further comprises instructions that when executed by the processor cause the processor to display, via a display, information representing the at least one physical location.

61. The system of claim 54, wherein the product identification information is received while the physical location of the reader is substantially static.

62. The system of claim 54, wherein the product identification information is received over a predetermined period of time.

63. A non-transitory computer-readable medium having stored thereon computer-executable instructions that when executed by a computer cause the computer to:

receive, at an antenna operatively coupled to a radio-frequency identification (RFID) reader, product identification information encoded in an RF signal transmitted by a plurality of RFID tags, each of the plurality of RFID tags associated with a respective one of a plurality of products;

process, using the product identification information, information contained in a portion of the encoded RF signal to compare apparent location information associated with the RFID reader with prior location information associated with at least one of the plurality of products; and

update the apparent location information to match the prior location information where the apparent location information is different than the prior location information.

64. The computer-readable medium of claim 61, wherein the prior location information includes product location information associated with the at least one of the plurality of products received on at least two different occasions prior to comparing the apparent location with the prior location information.