

METHOD AND SYSTEM FOR AUTOMATED LUGGAGE SECURITY INSPECTION

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This PCT Patent Application claims the benefit of U.S. Patent Application Serial Number 14/881,537 filed on October 13, 2015 which claims the benefit of U.S. Provisional Patent Application Serial Number 62/120,473 filed on February 25, 2015 entitled “Method And Apparatus For Automated Luggage Security Inspection,” and also claims the benefit of Canada Patent Application Serial No. 2917705 filed on October 13, 2015, the entire disclosures of the applications being considered part of the disclosure of this application and hereby incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] A method and system for automated luggage security inspection. More particularly, a method and system for controlling an activity area, such as a checked bag reconciliation area, that utilize at least one automatic material handling device, such as an automatic guided vehicle.

2. Description of the Related Art

[0003] In airport security operations, it is known in the art for suspect luggage/baggage, i.e., alarmed or unknown luggage items, to be inspected in a Checked Bag Reconciliation Area (CBRA). In the CBRA, the suspect luggage items are inspected by an agent and subsequently transferred to an appropriate location based on the inspection. Typically, the suspect luggage enters the CBRA on a staging conveyor from which it is manually removed by an agent and placed on a stand-alone inspection table. The luggage is then inspected on the inspection table by the agent, and based on the inspection, the agent determines whether the luggage item is cleared or not cleared. If the suspect luggage is

cleared by the agent, it is manually transported by the agent to a clearance conveyor from which it can be picked up by another agent for transportation to an airplane or other suitable destination. If the suspect luggage is not cleared by the agent, it is transferred to a re-insert conveyor wherein it is transferred to an appropriate destination for further inspection.

[0004] There remains room in the art for improved luggage handling and transportation processes, particularly in activity areas like the CBRA. More specifically, there remains a need for improvements to make current luggage inspection processes in the CBRA more streamlined and less physically demanding for agents working in the CBRA.

SUMMARY OF THE INVENTION

[0005] According to an aspect of the disclosure, the disclosure provides for a method of operating a checked bag reconciliation area. The method includes the step of transporting a luggage item from an entrance mechanism to one of a plurality of inspection stations. Once the luggage item is at the inspection station, the method proceeds by conducting an inspection of the luggage item at the inspection station. The step of transporting the luggage item from an entrance mechanism to one of a plurality of inspection stations includes transporting the luggage item to the inspection station with the luggage item disposed on a search table of an automatic guided vehicle, and the step of conducting an inspection of the luggage item includes conducting the inspection of the luggage item while the luggage item is disposed on the search table of the automatic guided vehicle.

[0006] According to a further aspect of the disclosure, an additional method of operating a checked bag reconciliation area is provided. The method includes the step of positioning a luggage item on a search table of an automatic guided vehicle. The method further includes programming at least one bag ID into a control system, wherein the bag ID includes information related to the luggage item. After the bag ID has been programmed

into the control system, the method proceeds by determining an inspection station to transport the luggage item based on the bag ID. After the inspection station has been determined, the method proceeds by transmitting instructions to the automatic guided vehicle from the control system to transport the luggage item to the determined inspection station. The method then continues by transporting the luggage item to the determined inspection station with the luggage item disposed on the search table of the automatic guided vehicle. The method then proceeds by conducting an inspection of the luggage item at the determined inspection station with the luggage item disposed on the search table of the automatic guided vehicle.

[0007] According to another aspect of the disclosure, a system for operating a checked bag reconciliation area is provided. The system includes an entrance mechanism wherein luggage items are received into the checked baggage reconciliation area. The system also includes at least one inspection station spaced from the entrance mechanism. At least one pathway extends between the entrance mechanism and the at least one inspection station. The system further includes at least one automatic guided vehicle including a chassis having a plurality of wheels for establishing movement of the automatic guided vehicle and a search table connected to the chassis for transporting the luggage items between the entrance conveyor and the inspection station with the luggage item disposed on the search table and for allowing the luggage item to be inspected while the luggage item is positioned on the search table. The system also includes a control system wirelessly connected to the automatic guided vehicle for controlling the movement of the automatic guided vehicle along the at least one pathway between the entrance conveyor and the at least one inspection station.

[0008] According to yet another aspect of the disclosure, a method of operating an activity area is provided. The method includes positioning a luggage item on a material

handling device with the luggage item located at a first location in the activity area. The method also includes providing instructions from a control system to the material handling device to move the luggage item from the first location to an inspection station in the activity area. The method proceeds with transporting the luggage item from the first location to the inspection station with the material handling device and with the luggage item disposed on the material handling device. Once at the inspection station, the method includes conducting an inspection of the luggage item at the inspection station with the luggage item disposed on the material handling device. The method continues with determining a secondary destination to transport the luggage item based on the inspection of the luggage item. Once the secondary destination has been determined, the method proceeds by providing instructions from the control system to the material handling device to move the luggage item from the inspection station to the determined secondary destination. Finally, the method includes transporting the luggage item to the determined secondary destination with the material handling device with the luggage item disposed on the material handling device.

[0009] According to a further aspect of the disclosure, a further system for operating a checked bag reconciliation area is provided. The system includes an entrance mechanism wherein luggage items are received into the checked baggage reconciliation area. The at least one inspection station is spaced from the entrance mechanism. The system also includes at least one material handling device including an inspection surface for supporting at least one of the luggage items on the inspection surface and transporting the at least one luggage item between the entrance mechanism and the inspection station with the at least one luggage item supported by the inspection surface and for allowing the at least one luggage item to be inspected while the at least one luggage items is supported by the inspection surface. The system further includes a control system wirelessly

connected to the material handling device for automatically controlling the movement of the material handling device.

[0010] According to an additional aspect of the disclosure, a further method of operating a checked bag reconciliation area is provided. The method includes positioning a luggage item on a material handling device while the material handling device is positioned at a first location in the checked bag reconciliation area. The method also includes transmitting a first input to a control system, wherein the first input is related to at least one of: bag ID information related to the luggage item and a condition in the checked bag reconciliation area. The method proceeds by determining one inspection station of a plurality of inspection stations to transport the luggage item to based on the first input. The method further continues with providing instructions from the control system to the material handling device to move from the first location to the determined inspection station. Additionally, the method includes transporting the luggage item from the first location to the determined inspection station with the luggage item disposed on the material handling device.

[0011] According to yet another aspect of the disclosure, another method of operating a checked bag reconciliation area is provided. The method includes positioning a plurality of luggage items each on one of a plurality of material handling devices. The method further includes transmitting a first input to a control system, wherein the first input is related to at least one of: bag ID information related to the luggage items and a condition in the checked bag reconciliation area. The method proceeds by determining an order of priority of the material handling devices based on the first input. The method continues with providing instructions from the control system to the plurality of material handling devices to each move to one of a plurality of inspection stations in the determined order of priority. Finally, the method includes transporting the luggage items

from the first location to the plurality of inspection stations in the determined order of priority with the luggage items each disposed on one of the material handling devices.

[0012] According to another aspect of the disclosure, a further system for operating a checked bag reconciliation area is provided. The system includes an entrance mechanism wherein luggage items are received into the checked bag reconciliation area. At least one inspection station is spaced from the entrance mechanism by a transportation distance. The system further includes at least one material handling device including an inspection surface for supporting at least one of the luggage items on the inspection surface and transporting the at least one luggage item between the entrance mechanism and the inspection station along the transportation distance with the at least one luggage item supported by the inspection surface and for allowing the at least one luggage item to be inspected while the at least one luggage items is supported by the inspection surface. The transportation distance between the entrance mechanism and the at least one inspection station is independent of the conveyors. Furthermore, a control system is wirelessly connected to the material handling device for automatically controlling the movement of the material handling device.

[0013] According to yet another aspect of the subject disclosure, a system for prioritizing an automated movement of a plurality of luggage items is provided. The system includes a data store comprising a computer readable medium storing a program of instructions for the prioritizing the automated movement. The system also includes a processor that executes the program of instructions. Furthermore, the system includes a luggage information receiver configured to receive data associated with each of the plurality of luggage items. Moreover, the system includes a luggage classifier configured to correspond the received data with priority data, the priority data being assigned to each of the plurality of luggage items. Additionally, the system includes an instructions

communicator configured to communicate the priority data to a system for operating a checked bag reconciliation area. The plurality of luggage items are processed via the checked bag reconciliation area based on the priority data.

[0014] According to a further aspect of the disclosure, a further method of operating a checked bag reconciliation area is provided. The method includes transporting a luggage item from an entrance mechanism to one of a plurality of inspection stations. After the luggage item is transported to the inspection station, the method continues by conducting an inspection of the luggage item at the inspection station. Transporting a luggage item from an entrance mechanism to one of a plurality of inspection stations includes transporting the luggage item to the inspection station with the luggage item disposed on a search table of an automatic guided vehicle. Further, conducting an inspection of the luggage item includes conducting the inspection of the luggage item while the luggage item is disposed on the search table of the automatic guided vehicle, and wherein the inspection is conducted independent of an agent.

ADVANTAGES OF THE INVENTION

[0015] The invention in its broadest aspect therefore provides for a system and method for operating a checked bag reconciliation area that improves manpower utilization, minimizes strenuous handling of luggage items, and improves data handling throughout the luggage inspection process.

[0016] More particularly, since the luggage items are automatically delivered to the inspection stations, and the luggage items may automatically depart the inspection by way of the material handling devices, the prior art steps of manually placing the bag onto the search table and manually moving the bag to the correct disposition location are eliminated. By eliminating these steps, luggage items are able to be processed through the activity area faster, and agents are able to invest more time and energy into the primary task of

investigating luggage items or into other value added processing operations. Additionally, since these steps are eliminated, the likelihood of workplace injuries is reduced since the number of strenuous lifting tasks is reduced. Eliminating these steps also expands the job pool of people that may work as agents, including those with certain physical disabilities.

[0017] According to a further aspect of the subject method and system, luggage items may be prioritized and processed faster because the material handling devices may be dynamically assigned to inspection stations and automatically moved to the inspection stations based on conditions in the activity area and bag ID information that correlates with the luggage items, like departure time and security level.

[0018] Furthermore, the subject method and system improves the handling of data related to the luggage items because bag ID information associated with the luggage items is synced with the material handling devices and the luggage items travel with the same material handling device throughout the inspection process.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] Other advantages of the present invention will be readily appreciated, as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

[0020] Figure 1 is a top schematic view of an example embodiment of a checked bag reconciliation area including a plurality of automatic guided vehicles disposed therein;

[0021] Figure 2 is a perspective view of an example embodiment of an automatic guided vehicle with a luggage item disposed on a search table of the automatic guided vehicle;

[0022] Figure 3 is a perspective view of a pair of inspection stations, each with an automatic guided vehicle and inspecting agent positioned at the inspecting station;

[0023] Figure 4 is a schematic view of an example embodiment of a control system for controlling the automatic guided vehicles in the checked bag reconciliation area;

[0024] Figure 5 is a top schematic view of the checked bag reconciliation area of Figure 1 illustrating egress paths which inspecting agents may utilize;

[0025] Figure 6 is a flow diagram of a first example method of operating an activity area;

[0026] Figure 7 is a flow diagram of a second example method of operating an activity area;

[0027] Figure 8 is a flow diagram of a third example method of operating an activity area;

[0028] Figure 9 is a flow diagram of a fourth example method of operating an activity area;

[0029] Figure 10 is a flow diagram of a fifth example method of operating an activity area;

[0030] Figure 11 is a flow diagram of a sixth example method of operating an activity area; and

[0031] Figure 12 is a flow diagram of a seventh example method of operating an activity area.

DESCRIPTION OF THE ENABLING EMBODIMENT

[0032] Referring to the Figures, wherein like numerals indicate corresponding parts throughout the several views, a system and method of operating an activity area, such as a checked bag reconciliation area **20** is disclosed. The example embodiments demonstrate how the subject system and method may be utilized in a checked bag reconciliation area **20** of an airport, however, it should be appreciated that the subject system and method can be

utilized in activity areas of other transportation hubs including, but not limited to, checked bag reconciliation areas of train stations and marinas.

[0033] An example embodiment of an improved checked bag reconciliation area **20** in accordance with the subject system is shown in Figure 1. The system includes an entrance mechanism **24** for providing suspect luggage items **22** into the checked baggage reconciliation area. In the example embodiment, the entrance mechanism is an alarm conveyor line **24** that extends into the checked bag reconciliation area **20** for delivering suspect luggage items into the checked bag reconciliation area **20**. It should be appreciated that other types of entrance mechanisms **24** could be used such as, but not limited to, an ingress door.

[0034] Furthermore, a plurality of inspection stations **26** are spaced from the alarm conveyor line **24** by a transportation distance **T**. Four inspection stations **26** are provided in the checked bag reconciliation area **20** of the example embodiment, however, it should be appreciated that more or fewer inspection stations **26** could be utilized depending on the specific needs of the particular checked bag reconciliation area **20**. Each of the inspection stations **26** may be stationed by one or more inspecting agents **28**. The inspecting agents **28** conduct inspections of the luggage items **22** that are received by the alarm conveyor line **24** after they are delivered to the inspection stations **26**. The inspection stations **26** could alternatively be completely autonomously, i.e., operated by machines / computers and independent of an human agent.

[0035] The system further includes at least one material handling device **30** for receiving luggage items **22** from the alarm conveyor line **24** and transporting the luggage items **22** within the checked bag reconciliation area **20**. In the example embodiments, the material handling device **30** is an automatic guided vehicle **30**, however, it is anticipated that other automatic material handling devices could be utilized including, but not limited

to, overhead conveyors. In the example embodiments, the luggage items **22** are received onto a search table **32** of the automatic guided vehicle **30** from the alarm conveyor line **24**. It should be appreciated that any number of automatic guided vehicles **30** could be utilized and it is advantageously easy to add and remove automatic guided vehicles **30** from the checked bag reconciliation area **20**. As will be discussed in greater detail below, each automatic guided vehicle **30** is programmed to automatically, i.e., without a human driver, transport the luggage items **22** through the checked bag reconciliation area **20** based on instructions provided by a control system **44**. In the example embodiment, a single luggage item **22** may be disposed on the search table **32** of each automatic guided vehicle **30**, however, it should be appreciated that more luggage items **22** could be disposed thereon.

[0036] In the example embodiments, the transportation distance **T** between the entrance mechanism **24** and the inspection stations **26** is completely independent of conveyors. More specifically, rather than using conveyors to transport luggage items **22** along the transportation distance **T**, the luggage items **22** are entirely transported by way of the automatic guided vehicles **30**. The term “conveyor” as used herein includes all conventional material moving conveyors. It should be appreciated that making the transportation distance **T** independent of conveyors advantageously opens up the floor space along the transportation distance **T**. Thus, other objects may be placed on the floor space, and, as presented in Figure 5, the open floor space may be used to provide additional ingress / egress paths **67** for agents, or additional routes that the automatic guided vehicles **30** may follow. This also advantageously allows the checked bag reconciliation area **20** to be smaller.

[0037] With reference back to Figure 1, a pathway **34** is disposed on the ground of the checked bag reconciliation area **20** on which the automatic guided vehicles **30** are configured to follow. The pathway **34** includes numerous segments that extend to different

areas of the checked bag reconciliation area **20** to allow the automatic guided vehicle **30** to be moved to the different areas based on the instructions from the control system **44**. The pathway **34** may take various forms including, but not limited to, magnetic markers or wires on the floor. Further, the pathway **34** may be electronically mapped into software of the control system **44** such that the automatic guided vehicle **30** may be programmed to automatically move along a programmed pathway **34** via GPS coordinate mapping.

[0038] Figure 4 is a diagram of components of the control system **44** that controls the various components of the checked bag reconciliation area **20**. The control system **44** includes a Baggage Handling System (BHS) Network **46** for connecting to the various components of the checked bag reconciliation area **20**. The control system **44** further includes one or more primary and backup servers **48** for hosting the BHS network **46** and storing network information on one or more databases of the servers **48**. More specifically, a data record containing inputs such as bag ID information on each luggage item and information related conditions within the checked bag reconciliation area **20** are stored on databases of the servers **50**. The bag ID information may include information such as flight departure time, flight destination, Risk Based Security (RBS) level, and a priority indicator that correlates with each specific luggage items **22**. Furthermore, the condition in the checked bag reconciliation area **20** may include various conditions including, but not limited to, the speeds at which luggage items **22** are being processed through each inspection station **26**

[0039] More specific aspects of the servers **48** include a data store **47** that includes a computer readable medium **49** that has a program of instructions for prioritizing automatic movement of the material handling devices **30**. The servers **48** may also include a processor **51** for executing the program of instructions. The server **48** may further include a luggage information receiver **53** that is configured to receive the bag ID information / conditions of

the checked bag reconciliation area **20**. Moreover, the servers **48** are programmed to include a luggage classifier **55** that is configured to correlate the received bag ID information with priority data, wherein the priority data is assigned to each of the plurality of luggage items **22**. The server also includes an instructions communicator **57** that is configured to communicate the priority data to the BHS Network **46** to move the automatic guided vehicles **30** and process the luggage items **22** based on the priority data. The servers **50** may further include one or more virtual machines **52** that provide for remote access to the server **50**.

[0040] The control system **44** also includes one or more graphical user interfaces **54** that are connected to the BHS Network **46** for presenting network information to agents **28** of the network **46**. One of the graphical user interfaces **54** is disposed on each of the automatic guided vehicles **30**. The graphical user interfaces **54** may further be disposed at other locations with the checked bag reconciliation area **20**, e.g., at the inspection stations **26**. Furthermore, a plurality of programmable logic controllers **56** are connected to the network **46** for activating and deactivating components of the checked bag reconciliation area **20**, e.g., conveyors. The control system **44** also includes one or more wireless access points **58** that are connected to the network **46** for providing wireless access to components of the checked bag reconciliation area **20**, including the automatic guided vehicles **30**.

[0041] A cart computer **59** (schematically shown), is disposed on each of the automatic guided vehicles **30** and is electrically connected to the BHS Network **46** via the wireless access point **58** for transmitting and receiving information over the BHS Network **46** for controlling the movement of the automatic guided vehicles **30** along different sections of the pathway **34**. Said another way, during operation of the checked bag reconciliation area **20**, the cart computers **59** of the automatic guided vehicles **30** receive instructions from the control system **44** to move the automatic guided vehicles along

specific sections of the pathway **34** based on the bag ID information that is associated with each specific luggage item **22**.

[0042] The cart computer **59** of each automatic guided vehicle **30** is electrically connected with the graphical user interface **54** on each of the automatic guided vehicles **30** for allowing agents **28** to view the bag ID information associated with each luggage item **22**, to transmit information to the control system **44**, and to program movement of the automatic guided vehicles **30** based on the inspections that they perform. The graphical user interface **54** on each of the automatic guided vehicles **30** may be configured as a touch screen to allow the agent **28** to input information into the cart computer **59**. Alternatively, one or more stand-alone input devices, e.g., a keyboard and mouse, may be utilized to allow the agent to input information into the cart computer **59**.

[0043] With reference back to Figure 1, a staging area **40** is provided for positioning the automatic guided vehicles **30** after receiving luggage items and prior to moving to the at least one inspection station **26**. From the staging area **40**, the automatic guided vehicle **30** may dynamically follow specific sections of the pathway **34** to the inspection stations **26** based on instructions from the control system **44**.

[0044] After a luggage item **22** has been inspected at the inspection stations **26**, it may be transferred via the material handling device **30** to one of a plurality of secondary destination **64, 66**. The secondary destinations **64, 66** include a clear bag conveyor line **64** to which the luggage item **22** is transported in response to a determination that the luggage item **22** has a clear status. The secondary destination **64, 66** may further include a re-inspection conveyor line **66** to which the luggage item **22** may be transported in response to a determination that the luggage item **22** must be re-inspected. The secondary destination **64, 66** may further include a fail area, or secondary search station (not shown) that the luggage item may be transported to in the event of a failed search.

[0045] An example embodiment of an automatic guided vehicle **30** is best presented in Figure 2. The automatic guided vehicle **30** includes a chassis **60**. A plurality of wheels (not shown) are connected to the chassis **60** for establishing rolling movement of the automatic guided vehicle **30**. The automatic guided vehicle **30** further includes a powertrain **71, 73, 75** (schematically shown) that is operably connected to the wheels for providing movement of the wheels. In the example embodiment, the powertrain includes a battery **71**, an electric motor **73**, and transaxle **75** that are operably connected to the wheels to provide movement to the wheels. It should be appreciated that other types of powertrain components could be utilized, e.g., an internal combustion engine.

[0046] The automatic guided vehicle **30** further includes a search table **32** that is connected to the chassis **60**. The search table **32** is large enough such that it can receive a luggage item **22** and transport the luggage item **22** while the luggage item **22** is positioned on the search table **32**. Furthermore, the search table **32** is large enough such that the luggage item **22** may be inspected while disposed on the search table **32**. In the example embodiment, the search table **32** is of a stainless steel material and extends along a plane with a generally rectangular shape. It should be appreciated that the stainless steel material allows the search table **32** to be easily wiped clean. It should be further be appreciated, that the search table **32** could have other shapes, and does not have to extend along a plane. Further, it should be appreciated that the search table **32** could be made of other suitable materials, ideally of materials that are easy to maintain in a sterile condition.

[0047] The automatic guided vehicle **30** also includes a lifting mechanism **62** that interconnects the chassis **60** and the search table **32**. The lifting mechanism **62** is configured to adjust the height of the search table **32** and to pivot the search table **32** relative to the chassis **60** to allow the search table **32** to be raised, lowered, and pivoted relative to the chassis **60**. In the example embodiment, the lifting mechanism **62** includes a

plurality of telescoping legs **62** that are connected to an actuator (not shown) to provide movement of the telescoping legs **62**. The telescoping legs **62** may be independently moveable relative to one another to provide for pivoting movement of the search table **32**. It should be appreciated that other lifting mechanisms **62** could be utilized such as, but not limited to, a scissor-lift type mechanism. It should also be appreciated that the lifting mechanism **62** may be configured to pivot the search table **32** in any direction. Various components may alternatively be utilized to provide the pivoting movement of the search table **32**, e.g., one or more ball joints, or a plurality of support members that pivot relative to one another and / or the chassis **60** and search table **32**.

[0048] The automatic guided vehicle **30** may further include a connecting mechanism (not shown) for connecting the automatic guided vehicle **30** to other automatic guided vehicles **30**. The connecting mechanism may also be utilized to connect the automatic guide vehicle **30** to a conveyor to allow luggage items **22** to easily be received onto the search table **32** from a conveyor, and to allow the automatic guided vehicle **30** to easily dispense items from the search table **32** onto the conveyor. Said another way, the connecting mechanism may be used to fixedly connect the automatic guided vehicle **30** to a conveyor with the automatic guided vehicle **30** disposed in alignment with the conveyor, thereby allowing luggage items **22** to easily be transferred between the conveyor and the automatic guided vehicle **30**.

[0049] The automatic guided vehicle **30** also includes a proximity sensor **63** (schematically shown) for detecting the presence of objects in the way of the automatic guided vehicle. The proximity sensor **63** is electrically connected to the cart computer **59** to stop the automatic guided vehicle **30** in response to detection of objects by the proximity sensor **63**. The automatic guided vehicle **30** also includes a detecting mechanism **65** for detecting the position of the pathway **34** relative to the automatic guided vehicle **30** to

facilitate movement of the automatic guided vehicle **30** along the pathway **34**. The automatic guided vehicle **30** further may include such features as an emergency stop button to allow an agent to stop the automatic guided vehicle in the event of an emergency and a charging input to allow the automatic guided vehicle **30** to easily be connected to a charging terminal at an inspection station **26** while luggage items **22** disposed on the search table **32** are being inspected (or at other locations within the activity area).

[0050] With reference to Figures 6-12, methods of operating a checked bag reconciliation area **20** are also disclosed. According to a first example method best presented in Figure 6, the method includes **100** receiving a luggage item **22** onto a material handling device **30** from an entrance mechanism **24** of the checked bag reconciliation area **20**. As explained above, the material handling device **30** may be an automatic guided vehicle **30**, and the luggage item **22** may be received into a search table **32** of the automatic guided vehicle **30**. As explained in the foregoing, in the example embodiment of the checked bag reconciliation area **20**, the entrance mechanism is an alarm conveyor line **24**. In more detail, the step of **100** receiving the luggage item **22** onto the search table **32** in the example embodiment includes moving the automatic guided vehicle **30** from a position beneath the alarm conveyor to a position in which the automatic guided vehicle **30** is adjacent to an end of the alarm conveyor line **24** and vertically lower than the alarm conveyor line **24**. Once the automatic guide vehicle **30** is in this position, the alarm conveyor line **24** can push a luggage item **22** onto the search table **32**. Said another way, the automatic guided vehicle **30** may move a distance along and beneath a length of the alarm conveyor line **24** and stop at a position in which the search table **32** extends at least partially past the end of the alarm conveyor line **24** to allow luggage items **22** to be dumped onto the search table **32** after the luggage items **22** are pushed past the end of the alarm conveyor line **24**.

[0051] After the luggage item **22** is disposed on the search table **32** of the automatic guided vehicle **30**, the method continues with **102** transporting the luggage item **22** on the material handling device **30** to the staging area **40** with the luggage item **22** disposed on the material handling device **30**. More particularly, the luggage item **22** may be disposed on a search table **32** of the automatic guided vehicle **30** during transportation to the staging area **40**. It should be appreciated that a plurality of automatic guided vehicles **30** may line up in the staging area **40**, at which they remain until further instructions are provided by the control system **44**. In the event that a luggage item **22** was already disposed on the search table **32** of the automatic guided vehicle **30** when the automatic guided vehicle **30** entered the checked bag reconciliation area **20**, the pathway **34** includes a loading bypass path segment **38** that the automatic guided vehicle **30** may follow to bypass the alarm conveyor line **24**. In other words, the automatic guided vehicle **30** may follow the loading bypass path **38** to bypass the alarm conveyor line **24** and be moved directly to the staging area **40** if it is not necessary to receive a luggage item **22** from the alarm conveyor line **24**.

[0052] The method also includes **104** programming at least one input, such as bag ID information or a condition in the checked bag reconciliation area **20**, into the control system **44**. The input may be programmed into the control system **44** in various ways. For example, the input may be manually entered via a computer. As mentioned in the foregoing, the bag ID may include information related to the at least one luggage item **22** such as, but not limited to, flight departure time, flight destination and a risk based security level. Furthermore, the condition in the checked bag reconciliation area **20** may include various conditions including, but not limited to, the speeds at which luggage items **22** are being processed at each inspection station **26**. It should be appreciated that the input may be programmed into the control system **44** before or after the automatic guided vehicle **30** is positioned at the staging area **40**.

[0053] After the input has been programmed into the control system **44**, the method continues with **106** determining an inspection station **26** to transport the luggage item **22** to based on the first input. During this step, the control system **44** dynamically assigns the material handling devices **30** to specific inspection stations **26** based on the input, such as the bag ID information of the luggage items disposed on the specific material handling devices **30**. For example, the automatic guided vehicle **30** may recognize, based on the bag ID information, that a particular luggage item **22** has a high risk level associated therewith, and therefore dynamically assign the luggage item **22** to a high-risk inspection station **26**.

[0054] The method further also includes **108** determining an order of priority of the material handling devices **30** based on the input. Based on the determined order of priority, the luggage items **22** may advantageously be directed to inspection stations **26** in various orders based on need, and don't have to follow a "first in, first out" approach as is used in conventional checked bag reconciliation areas. For example the control system **44** may recognize, based on the bag ID information, that a particular luggage item **22** is scheduled to be stowed on an airplane that has a shortly approaching departure. To ensure that the luggage item **22** is delivered to the airplane on time, the automatic guided vehicle **30** dynamically assigns the luggage item **22** to an inspection station **26** that is currently available. During such a scenario, the automatic guided vehicle **30** may take priority to the chosen inspection station **26** over other automatic guided vehicles **30** that are waiting in queue.

[0055] It should be appreciated that the data store **47**, computer readable medium **49**, processor **51**, luggage information reader **53**, luggage classifier **55** and instructions communicator **57** of the servers **48** may be utilized to determine an inspection station **26** and to determine an order or priority. It should further be appreciated that the steps of **106**

determining an inspection station and **108** determining an order of priority may be performed separately, or at the same time as one another.

[0056] The bag ID information of a specific luggage item **22** may be synced with the cart computer **59** of the specific automatic guided vehicle **30** on which the luggage item **22** is placed after the bag ID information has been entered into control system **44**. Thus, after the bag ID information for a specific luggage item **22** has been synced with a specific cart computer **59**, the bag ID information may be displayed on the graphical user interface **54** of the automatic guided vehicle **30** or the inspection station **26** at which the automatic guided vehicle **30** is positioned to assist agents during inspections.

[0057] After the inspection station **26** has been determined, the method continues by **110** transmitting instructions to the material handling device **30** from the control system **44** to transport the luggage item **22** to the determined inspection station **26**. The method then continues with **112** transporting the luggage item **22** on the material handling devices **30** to the determined inspection station **26**. More specifically, the luggage item **22** may be transported to the determined inspection station **26** while disposed on the search table **32** of the automatic guided vehicle **30**. In the event that it is determined that the luggage item **22** does not need to be transported to an inspection station **26**, the pathway **34** includes a bypass search segment **45** that the material handling device **30** may follow to bypass the inspection stations **26**.

[0058] In an embodiment, once the material handling device **30** is positioned at the determined inspection station **26**, the method continues with **114** moving the search table **32** relative to the chassis **60** in a direction transverse to search table **32** to optimize the height of the search table **32** for the agent **28** positioned at the inspection station **26**. Said another way, the height of the search table **32** is adjusted to provide an ideal ergonomic placement of the search table **32** at which the agent **28** may inspect the luggage item **22**. It should be

appreciated that being able to adjust the height of the search table **32** makes the inspection process more ergonomic for agents **28** and even expands the pool of people which may work as agents **28**, including those with physical disabilities, e.g., those who utilize a wheelchair. Alternatively, the height of the search table **32** may be optimized for an automatic inspection machine that is positioned at the inspection station **26**.

[0059] After the height of the search table **32** has been adjusted, the method continues with **116** presenting the bag ID information to the inspection station **26**. More specifically, the bag ID information may be presented to an agent **28** positioned at the inspection station **26**. As mentioned in the foregoing, the bag ID information may be presented to the agent **28** on the graphical user interface **54** on the automatic guided vehicle **30** or on an auxiliary graphical user interface **54** that is positioned at the inspection station **26**. Additionally, the bag ID information may be scanned by a reading device (or otherwise programmed into the inspection station **26**). This may be utilized in embodiments in which the inspection station **26** is autonomous.

[0060] The method then includes **118** conducting an inspection of the luggage item **22** to determine a second destination **64, 66** to which the luggage item **22** should be transported. It should be appreciated that the inspection may be performed by an agent **28**, or it may be performed entirely autonomously, i.e., independent of an agent. It should also be appreciated that the agent **28** may utilize the bag ID information during the inspection. Once the second destination **64, 66** has been determined, the method proceeds by **120** determining and programming the secondary destination into the control system **44**, and **122** transmitting instructions to the material handling device **30** from the control system **44** to transport the luggage item **22** to the secondary destination **64, 66**. The method continues by **124** transporting the luggage item **22** to the secondary destination **64, 66** with the luggage item **22** disposed on the material handling device **30**. More specifically, the luggage item **22**

may be transported to the secondary destination **64, 66** while disposed on the search table **32** of the automatic guided vehicle **30**.

[0061] As mentioned in the foregoing, the secondary destinations **64, 66** may include a clear bag conveyor line **64** to which the luggage item **22** is transported in response to a determination that the luggage item **22** has a clear status. Once at the clear bag conveyor line **64**, the method continues with **126** unloading the luggage item **22** at the secondary destination. More specifically, the search table **32** may be moved relative to the chassis **60** in a direction transverse to the search table **32**. The search table **32** may also be pivoted relative to the chassis **60** to unload the luggage onto the clear bag conveyor line **64**. Once on the clear bag conveyor line **64**, the luggage item **22** is transported to a suitable destination to further the process of moving the luggage item **22** to its ultimate destination.

[0062] As also mentioned in the foregoing, the secondary destination **64, 66** may also include a re-inspection conveyor line **66** to which the luggage item **22** is transported in response to a determination that the luggage item **22** must be re-inspected. Like at the clear bag conveyor line **64**, once the material handling device **30** is positioned at the re-inspection conveyor line **66**, the search table **32** may be moved relative to the chassis **60** in a direction transverse to the chassis **60** and pivoted relative to the chassis **60** to unload the luggage onto the re-inspection conveyor line **66**. Once on the re-inspection conveyor line **66**, the luggage item **22** is transported to a suitable destination for further inspection. For example, the luggage item **22** may be transported to a secondary inspection station **26** for a more detailed inspection.

[0063] The secondary destination may further include a failed area or secondary search station (not shown) to which the luggage item **22** may be directed in the event of a failed inspection wherein it may receive a more detailed inspection.

[0064] It should be appreciated that numerous advantages are provided by the system and method disclosed herein. With regard to benefits related to the work force that operates the checked bag reconciliation area **20**, a first advantage is that agents **28** are able to remain better focused on the task of inspecting luggage since the material handling device **30** automatically delivers the suspect luggage to the inspection station **26**. Therefore, the agent **28** is able to focus his / her attention on the task of inspecting luggage items **22** rather than other tasks like manually transporting the luggage items **22**. Furthermore, because the automatic guided vehicle **30** automatically delivers the luggage item **22** to the inspection station **26**, agents **28** are not exposed to strains associated with the strains of lifting luggage items **22**. This can lead to reduced lost time and improved morale. Additionally, because the height of the search table **32** is adjustable, the ergonomics of the inspection process are improved for agents **28**, and a larger group of people may perform inspection tasks.

[0065] Furthermore, as illustrated in Figure 5, since fewer conveyors and other pieces of equipment are required in the checked bag reconciliation area **20** of the subject system, more ingress / egress paths **67** are provided that an agent **28** may follow. This provides for a more efficient and safe work environment.

[0066] The checked bag reconciliation area **20** also advantageously requires less space than convention checked bag reconciliation areas since the automatic guided vehicles **30** take up less space than conventional conveyor systems.

[0067] Additionally, the checked bag reconciliation area **20** may be quieter since fewer loud components, like conveyors, have to be utilized. In addition, automatic guided vehicles **30** may easily be shared between different checked bag reconciliation areas **20** if needed, thus improving throughput in the overall baggage handling operation.

[0068] Furthermore, the configuration of the checked bag reconciliation area **20** is easily modified based on current demands since few components are present that may have to be moved.

[0069] Additionally, different portions of the checked bag reconciliation area **20** are easily accessible because fewer barriers exist to navigate around the checked bag reconciliation area **20**, especially as compared to prior art checked bag reconciliation areas which include numerous conveyors.

[0070] In addition, the checked bag reconciliation area **20** may be a very hygienic work atmosphere since fewer components are utilized and because the automatic guided vehicles **30** are easily cleaned.

[0071] The preceding describes an implementation of the above method, but practitioners skilled in material handling can easily see other implementations using different equipment configurations. Obviously, many modifications and variations of the present invention are possible in light of the above teachings and may be practiced otherwise than as specifically described while within the scope of the appended claims. These antecedent recitations should be interpreted to cover any combination in which the inventive novelty exercises its utility. The use of the word "said" in the apparatus claims refers to an antecedent that is a positive recitation meant to be included in the coverage of the claims whereas the word "the" precedes a word not meant to be included in the coverage of the claims.

CLAIMS

What is claimed is:

Claim 1. A method of operating a checked bag reconciliation area, said method including:

loading a plurality of luggage items from an entrance mechanism each onto a search table of one of a plurality of automatic guided vehicles;

determining one of a plurality of security inspection stations at which to transport each of the luggage items, respectively, based on a bag ID of the luggage item, the bag ID comprising information related to at least one of: flight departure time, flight destination, and a risk based security level that corresponds with the luggage item;

transporting the plurality of luggage items each from the entrance mechanism to the determined one of the plurality of security inspection stations with the luggage disposed on the search table of the automatic guided vehicle;

conducting a security inspection of each of the luggage items at the determined security inspection station with the luggage item disposed on the search table of the automatic guided vehicle; and

wherein a transportation distance between the entrance mechanism and each of the plurality of security inspection stations is independent of conveyors.

Claim 2. A method as set forth in claim 1 further including programming the bag ID associated with each luggage item into a control system, and transmitting instructions to the automatic guided vehicles from the control system to transport the luggage items to the determined security inspection stations.

Claim 3. A method as set forth in claim 1 further including determining a secondary destination for each of the luggage items based on the inspection of the luggage item at the security inspection station, programming the secondary destination into the control system, and transmitting instructions to the automatic guided vehicle from the control system to transport the luggage item to the determined secondary destination.

Claim 4. A method as set forth in claim 3 further including transporting the luggage item to the secondary destination with the luggage item disposed on the search table of the automatic guided vehicle.

Claim 5. A method as set forth in claim 4 wherein the secondary destination is at least one of: a clear bag conveyor line, a re-inspection conveyor line, and failed bag area.

Claim 6. A method as set forth in claim 4 wherein each of the automatic guided vehicles further includes a chassis presenting a plurality of wheels for establishing movement of the automatic guided vehicle, the search table of each of the automatic guided vehicles is pivotable relative to the chassis, and wherein said method further includes unloading each of the luggage item onto a conveyor line at the secondary destination by pivoting the search table relative to the chassis to cause the luggage item to slide off of the search table onto the conveyor line.

Claim 7. A method as set forth in claim 1 wherein each of the automatic guided vehicles further includes a chassis presenting a plurality of wheels for establishing movement of the automatic guided vehicle, wherein the search table of each of the automatic guided vehicles extends along a plane in alignment with and above the chassis,

wherein the search table is moveable relative to the chassis, and said method further includes the step of moving the search table relative to the chassis in a direction perpendicular to the plane of the search table prior to conducting an inspection of the luggage item to optimize the height of the search table for the inspection station.

Claim 8. A method of operating a checked bag reconciliation area, said method including:

moving a plurality of luggage items each from an entrance mechanism to a search table of one of a plurality of automatic guided vehicles;

programming a plurality of bag IDs into a control system, wherein the bag IDs each includes information related to at least one of: flight departure time, flight destination, and a risk based security level that corresponds with the luggage item;

determining one of a plurality of security inspection stations to transport each of the luggage items based on the bag ID associated with each respective luggage item;

transmitting instructions to the automatic guided vehicles from the control system to transport the luggage items to the determined inspection stations;

transporting the luggage items to the determined security inspection stations with the luggage items each disposed on the search table of one of the automatic guided vehicles;

and

conducting a security inspection of the luggage items at the determined security inspection stations with the luggage items disposed on the search table of the automatic guided vehicles;

wherein a transportation between the entrance mechanism and each of the plurality of security inspection stations is independent of conveyors to provide increased floor space within the checked bag reconciliation area.

Claim 9. A method as set forth in claim 8 further including determining a secondary destination for each of the luggage items based on the inspections of the luggage items, programming the secondary destination into the control system, and transmitting the instructions to the automatic guided vehicles from the control system to transport the luggage items to the secondary destinations.

Claim 10. A method as set forth in claim 9 further including transporting the luggage items to the secondary destinations with the luggage items disposed on the search tables of the automatic guided vehicles.

Claim 11. A method as set forth in claim 10 wherein each of the secondary destinations is at least one of: a re-inspection conveyor line, and failed bag area.

Claim 12. A method as set forth in claim 10 wherein each of the automatic guided vehicles further includes a chassis presenting a plurality of wheels for establishing movement of the automatic guided vehicle, the search table is pivotable relative to the chassis, and wherein said method further includes unloading the luggage item onto a conveyor line at the secondary destination by pivoting the search table relative to the chassis to cause the luggage item to slide off of the search table onto the conveyor line.

Claim 13. A method as set forth in claim 8 wherein each of the automatic guided vehicles further includes a chassis presenting a plurality of wheels for establishing movement of the automatic guided vehicle, the search table extends along a plane in alignment and above the chassis and is moveable relative to the chassis, and said method

further includes moving the search table relative to the chassis in a direction perpendicular to the plane of the search table prior to conducting an inspection of the luggage item to optimize the height of the search table for the inspection station.

Claim 14. A system for operating a checked bag reconciliation area, said system comprising:

- an entrance mechanism wherein luggage items are received into the checked baggage reconciliation area;

- a plurality of security inspection stations each spaced from the entrance mechanism;

- a plurality of pathways extending between said entrance mechanism and said plurality of security inspection stations;

- a plurality of automatic guided vehicles each including a chassis having a plurality of wheels for establishing movement of said automatic guided vehicle and a search table connected to said chassis for transporting the luggage items between said entrance mechanism and said security inspection stations with the luggage items disposed on said search table and for allowing the luggage items to be inspected while the luggage items are positioned on said search tables; a control system wirelessly connected to said automatic guided vehicles for controlling the movement of said automatic guided vehicles along said at least one pathway between said entrance mechanism and said plurality of security inspection stations;

- a transportation between said entrance mechanism and each of said plurality of security inspection stations along said pathways is independent of conveyors to provide increased floor space within the checked bag reconciliation area.

Claim 15. A system as set forth in claim 14 wherein said search table of each of said automatic guided vehicles extends along a plane and is moveable in a direction perpendicular to said plane of said search table for adjusting the height of said search table such that it is at an optimal height for said inspection station.

Claim 16. A system as set forth in claim 15 wherein said search table is pivotally mounted on said chassis for allowing said search table to be pivoted relative to said chassis to slide the luggage items off of said search table.

Claim 17. A system as set forth in claim 14 wherein said automatic guided vehicles each further includes a proximity sensor for detecting objects proximal to said automatic guided vehicle and stopping said automatic guided vehicle in response to said detection.

Claim 18. A method of operating an activity area, said method including:
moving a plurality of luggage items each from an entrance mechanism to one of a plurality of automatic guided vehicles with the luggage item located a first location in the activity area;

providing instructions from a control system to the automatic guided vehicle to move the luggage item from the first location to one of a plurality of security inspection stations in the activity area;

transporting the luggage item from the first location to the one of a plurality of security inspection stations with the automatic guided vehicle and with the luggage item disposed on the automatic guided vehicle;

conducting a security inspection of the luggage items at the security inspection stations with the luggage items disposed on the automatic guided vehicles;

determining a secondary destination to transport each of the luggage items to based on the security inspections of the luggage items;

providing instructions from the control system to the automatic guided vehicles to move the luggage items from the security inspection stations to the determined secondary destinations; and

transporting the luggage items to the determined secondary destinations with the automatic guided vehicles with the luggage items disposed on the automatic guided vehicles;

wherein a transportation between the entrance mechanism and each of the plurality of security inspection stations is independent of conveyors to provide increased floor space within the activity area.

Claim 19. A system for operating a checked bag reconciliation area, said system comprising:

an entrance mechanism wherein a plurality of luggage items are received into the checked baggage reconciliation area;

a plurality of security inspection stations spaced from the entrance mechanism;

a plurality of automatic guided vehicles each including an inspection surface for supporting at least one of the plurality of luggage items on said inspection surface and transporting the at least one luggage item between said entrance mechanism and one of said security inspection stations with the at least one luggage item supported by said inspection surface and for allowing the at least one luggage item to be inspected while the at least one luggage items is supported by said inspection surface; and

a control system wirelessly connected to said automatic guided vehicles for automatically controlling the movement of said automatic guided vehicles;

a transportation between said entrance mechanism and each of said plurality of security inspection stations being independent of conveyors to provide increased floor space within the checked bag reconciliation area.

Claim 20. A method of operating a checked bag reconciliation area, said method including:

moving a plurality of luggage items each from an entrance mechanism to one of a plurality of automatic guided vehicles;

transmitting a plurality of first inputs to a control system, wherein each of the first inputs is related to at least one of: bag ID information related to at least one of: flight departure time, flight destination, and a risk based security level that corresponds with the luggage items or a condition in the checked bag reconciliation area;

determining one security inspection station of a plurality of security inspection stations to transport each of the luggage items to based on the first inputs;

providing instructions from the control system to the automatic guided vehicles to move from the first location to the determined security inspection stations; and

transporting each of the luggage item from the first location to the determined security inspection stations with the luggage item disposed on the automatic guided vehicles;

wherein a transportation distance between the entrance mechanism and each of the plurality of security inspection stations is independent of conveyors to provide increased floor space within the checked bag reconciliation area.

Claim 21. A method of operating a checked bag reconciliation area, said method including:

moving a plurality of luggage items each from an entrance mechanism to a search table of one of a plurality of automatic guided vehicles;

transmitting a plurality of first inputs to a control system each corresponding to one of the plurality of luggage items, wherein the first inputs each relate to at least one of: bag ID information related to the luggage item and a condition in the checked bag reconciliation area;

moving the plurality of the automatic guided vehicles with the luggage items disposed on the search tables of the automatic guided vehicles to a staging area being spaced from the entrance mechanism;

determining an inspection station at which to send each of the automatic guided vehicles based on the first inputs while the plurality of the automatic guided vehicles are positioned at the staging area;

determining an order of priority of movement of the plurality of automatic guided vehicles based on the first inputs while the plurality of automatic guided vehicles are positioned at the staging area;

providing instructions from the control system to the plurality of automatic guided vehicles to each move to the determined security inspection stations in the determined order of priority of movement, wherein the plurality of security inspection stations are spaced from the entrance mechanism and the staging area;

transporting the luggage items from the staging area to the determined security inspection stations in the determined order of priority of movement with the luggage items each disposed on one of the plurality of automatic guided vehicles; and

conducting a security inspection on each of the luggage items at the security inspection stations with the luggage items each disposed on the search table of one of the automatic guided vehicle;

wherein a transportation distance between the entrance mechanism and each of the plurality of security inspection stations is independent of conveyors to provide increased floor space within the checked bag reconciliation area.

Claim 22. A system for operating a checked bag reconciliation area, said system comprising:

an entrance mechanism wherein luggage items are received into the checked bag reconciliation area;

a plurality of security inspection stations each spaced from the entrance mechanism by a transportation distance;

a plurality of automatic guided vehicles each including an inspection surface for supporting at least one of the luggage items on said inspection surface and transporting the at least one luggage item between said entrance mechanism and said security inspection station along said transportation distance with the at least one luggage item supported by said inspection surface and for allowing the at least one luggage item to be inspected while the at least one luggage items is supported by said inspection surface;

said transportation distance between said entrance mechanism and said plurality of security inspection stations being independent of conveyors; and

a control system wirelessly connected to said material handling device for automatically controlling the movement of said automatic guided vehicles and for determining a security inspection station at which to transport each of the luggage items based on a bag ID of the luggage item, the bag ID comprising information related to at least one of: flight departure time, flight destination, and a risk based security level that corresponds with the luggage item.

Claim 23. A system for prioritizing an automated movement of a plurality of luggage items in a checked bag reconciliation area, comprising:

- a data store comprising a computer readable medium storing a program of instructions for the prioritizing the automated movement;

- a processor that executes the program of instructions;

- a luggage information receiver configured to receive data associated with each of the plurality of luggage items;

- a luggage classifier configured to correspond the received data with priority data, the priority data being assigned to each of the plurality of luggage items;

- an instructions communicator configured to communicate the priority data to a system for operating the checked bag reconciliation area,

- wherein the plurality of luggage items is processed via the checked bag reconciliation area in a predetermined order based on the priority data;

- an entrance mechanism wherein the plurality of luggage items are received into the checked bag reconciliation area;

- a plurality of automatic guided vehicles electrically connected to the instructions communicator, each for receiving at least one of the luggage items from the entrance mechanism and for carrying the at least one of the luggage items; and

a plurality of security inspection stations;

wherein instructions are transmitted from the instructions communicator to the automatic guided vehicles to transport each of the luggage items to a determined security inspection station, wherein the security inspection station is determined based on the priority data associated with each luggage item;

wherein a transportation distance between the entrance mechanism and each of the plurality of security inspection stations is independent of conveyors to provide increased floor space within the checked bag reconciliation area.

Claim 24. A method of operating a checked bag reconciliation area, said method including:

transporting a plurality of luggage items each from an entrance mechanism to one of a plurality of security inspection stations;

wherein the one of the plurality of security inspection stations is determined based on the security inspection station currently being free of automatic guided vehicles;

wherein the one of the plurality of security inspection stations is further determined based on a bag ID of the luggage item, the bag ID comprising information related to at least one of: flight departure time, flight destination, and a risk based security level that corresponds with the luggage item;

conducting an inspection of the luggage items at the determined security inspection stations; and

wherein transporting a plurality of luggage items each from an entrance mechanism to one of a plurality of security inspection stations includes transporting the luggage items to the security inspection stations with the luggage items each disposed on a search table of one of a plurality of automatic guided vehicle, and wherein conducting an inspection of the

luggage items includes conducting the inspection of the luggage items while the luggage items are disposed on the search tables of the automatic guided vehicles, and wherein the inspection is conducted independent of an agent;

wherein a transportation distance between the entrance mechanism and each of the plurality of security inspection stations is independent of conveyors to provide increased floor space within the checked bag reconciliation area.

Claim 25. A method of operating a checked bag reconciliation area as set forth in claim 1 wherein loading a plurality of luggage items from an entrance mechanism each onto a search table of one of a plurality of automatic guide vehicles includes moving the automatic guided vehicle to a position in which the automatic guided vehicle is adjacent to an end of the entrance mechanism and vertically lower than the entrance mechanism, and pushing the luggage item onto the search table.

Claim 26. A method of operating a checked bag reconciliation area as set forth in claim 25 wherein the entrance mechanism is a conveyor.

Claim 27. A method of operating a checked bag reconciliation area as set forth in claim 18 wherein said method further includes transporting the luggage item from the first location directly to the secondary destination along a bypass search segment.