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(54) **CHECKOUT DEVICE INCLUDING INTEGRATED BARCODE READER, SCALE, AND EAS SYSTEM**

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(57) **ABSTRACT**

A checkout device with a barcode reader, scale, and electronic article surveillance (EAS) system. The checkout device includes a scale assembly including a base portion and a weigh scale over the base portion. The weigh plate includes an aperture. A barcode reader is between the base portion and the weight scale and reads a barcode through the aperture in the weigh plate. A security label deactivation system is between the base portion and the weigh plate.

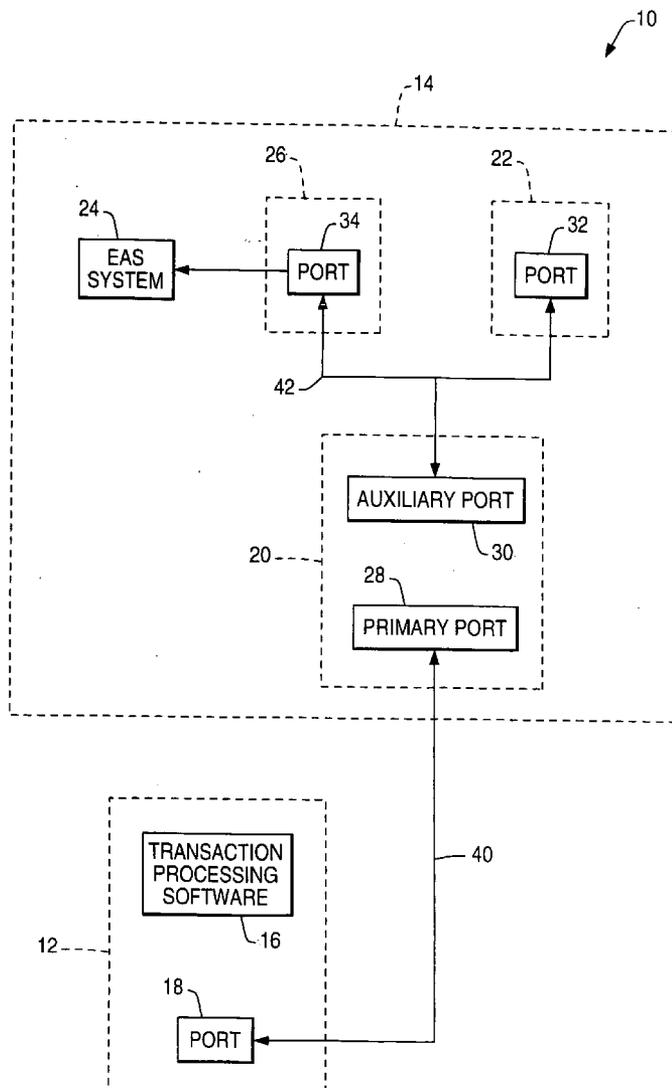


FIG. 1A

10

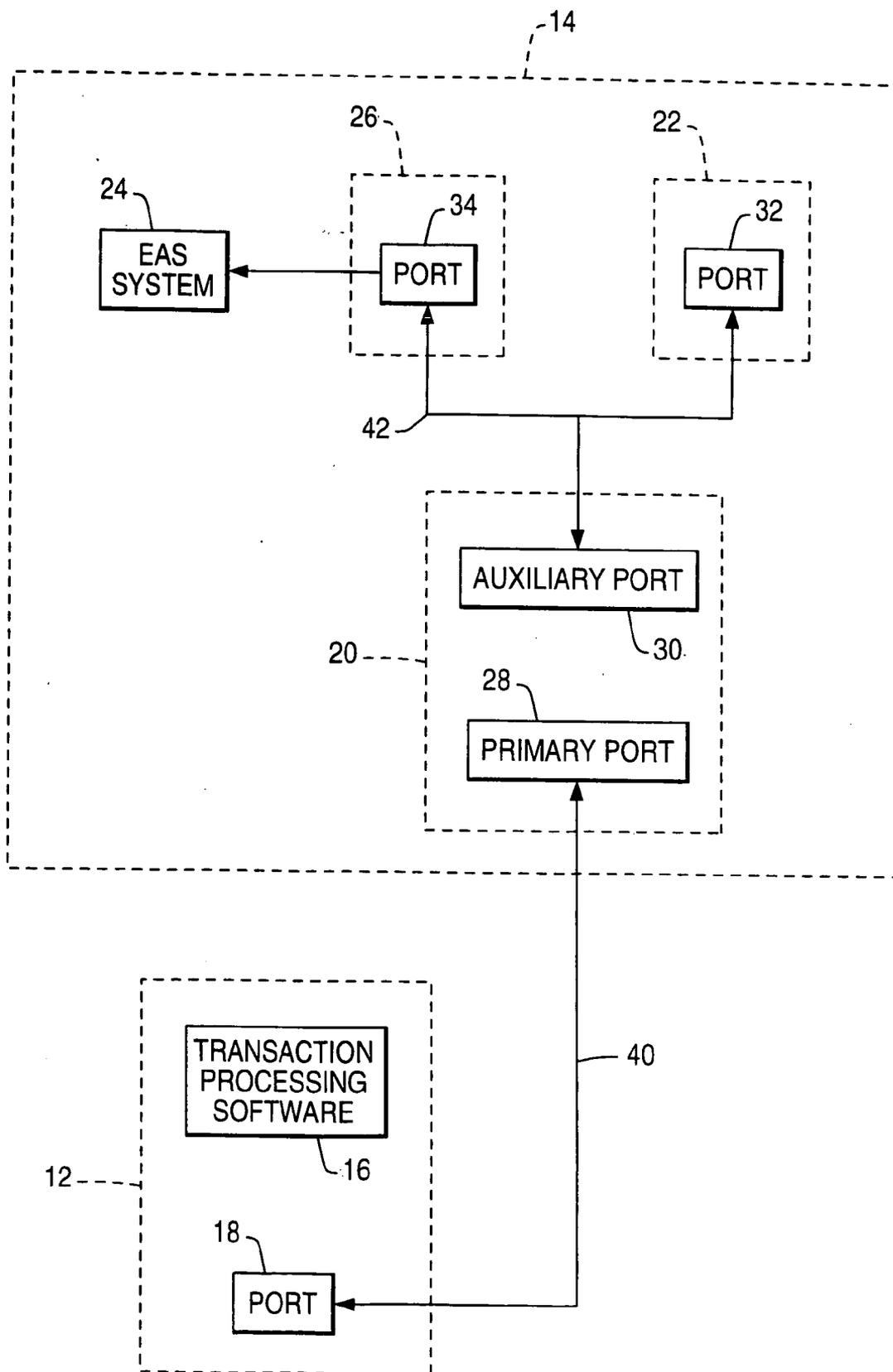


FIG. 1B

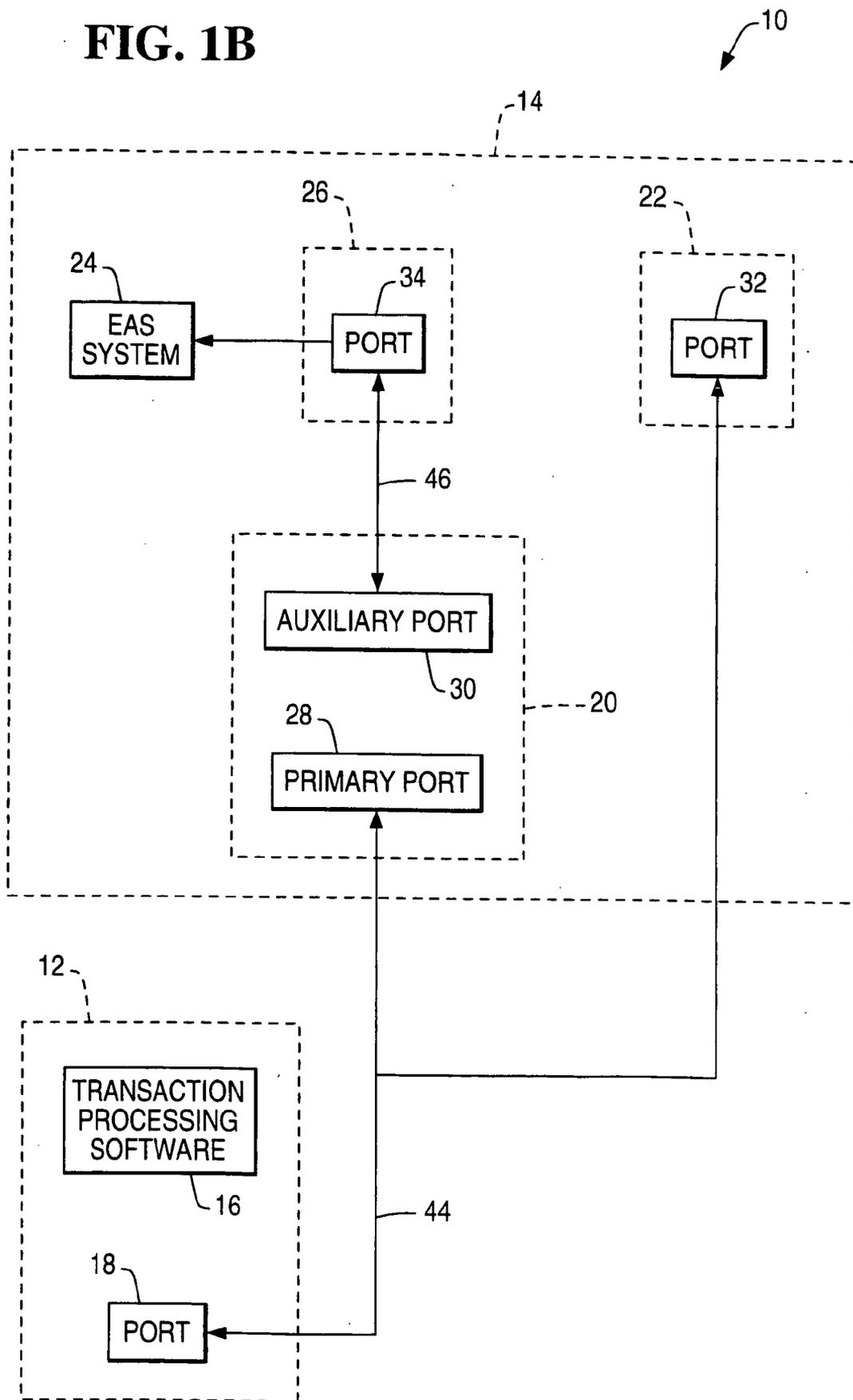
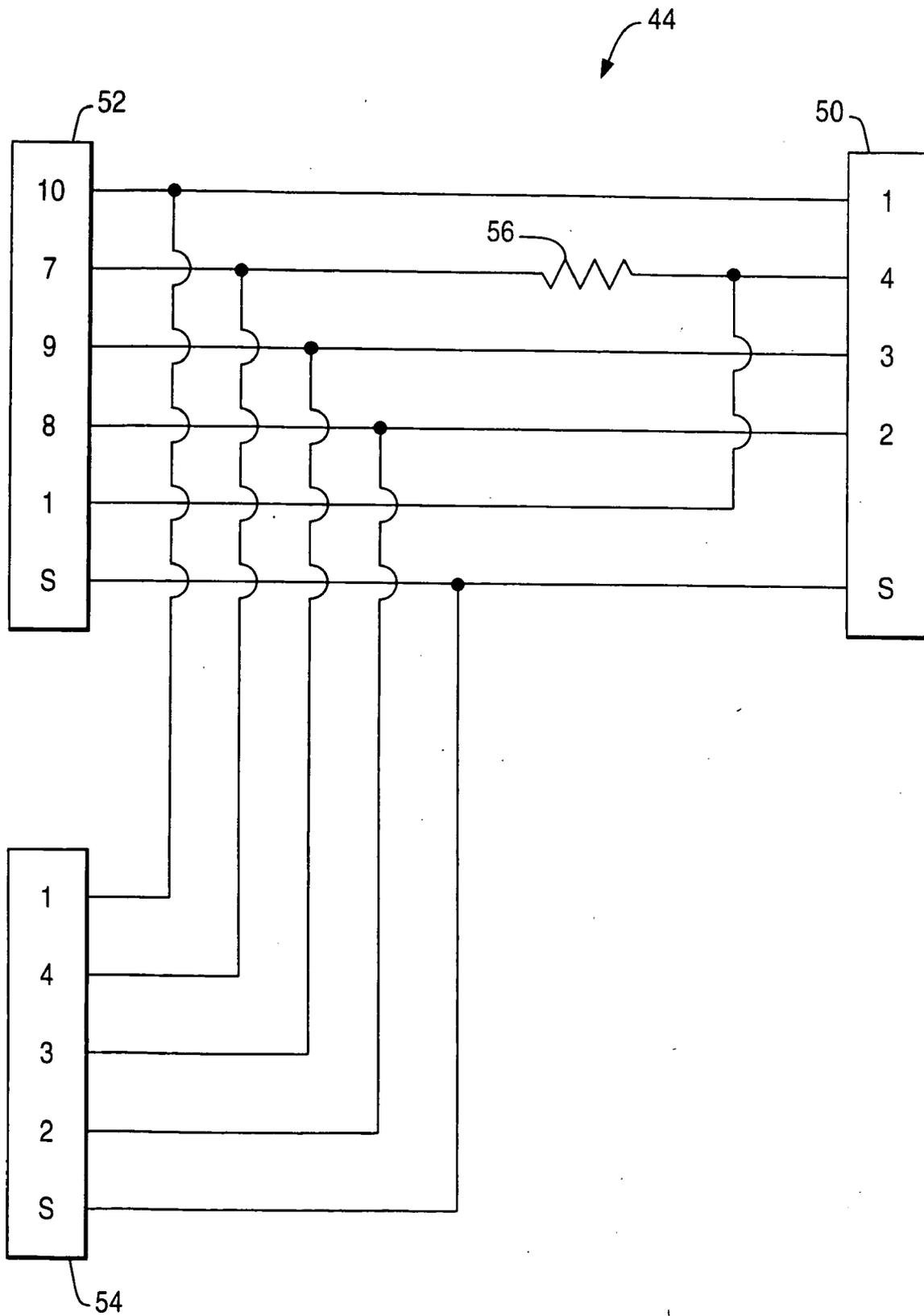
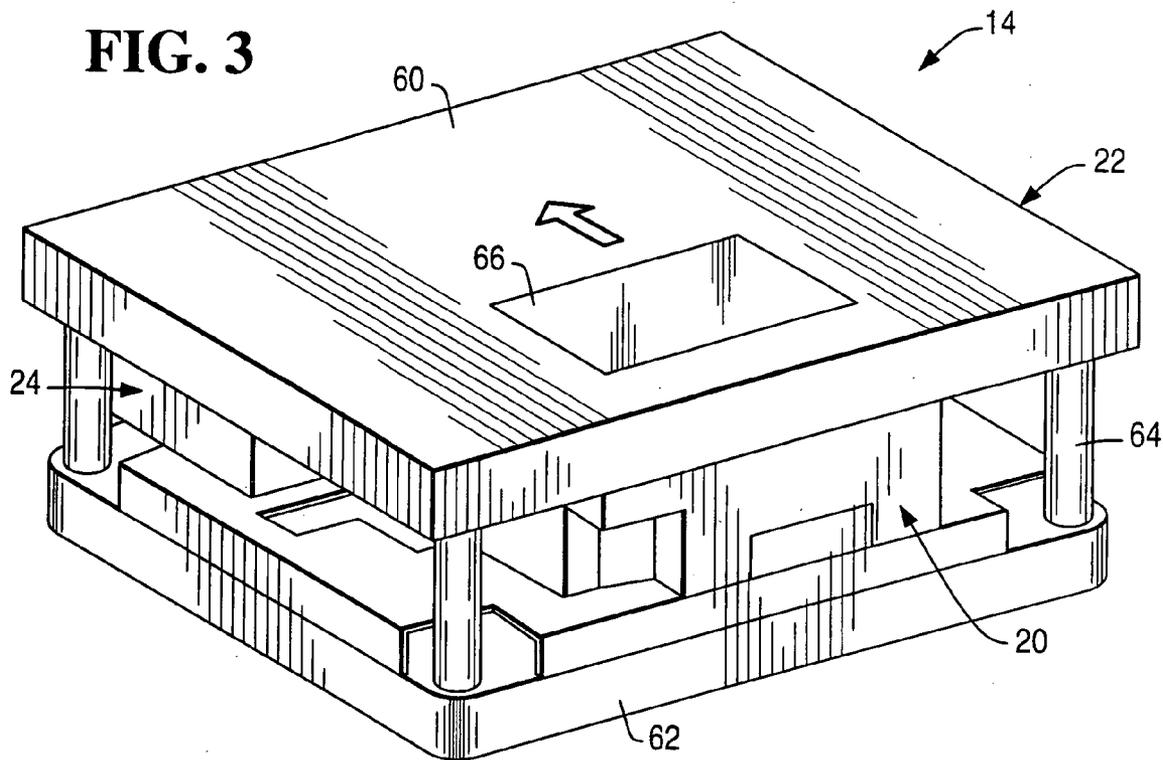


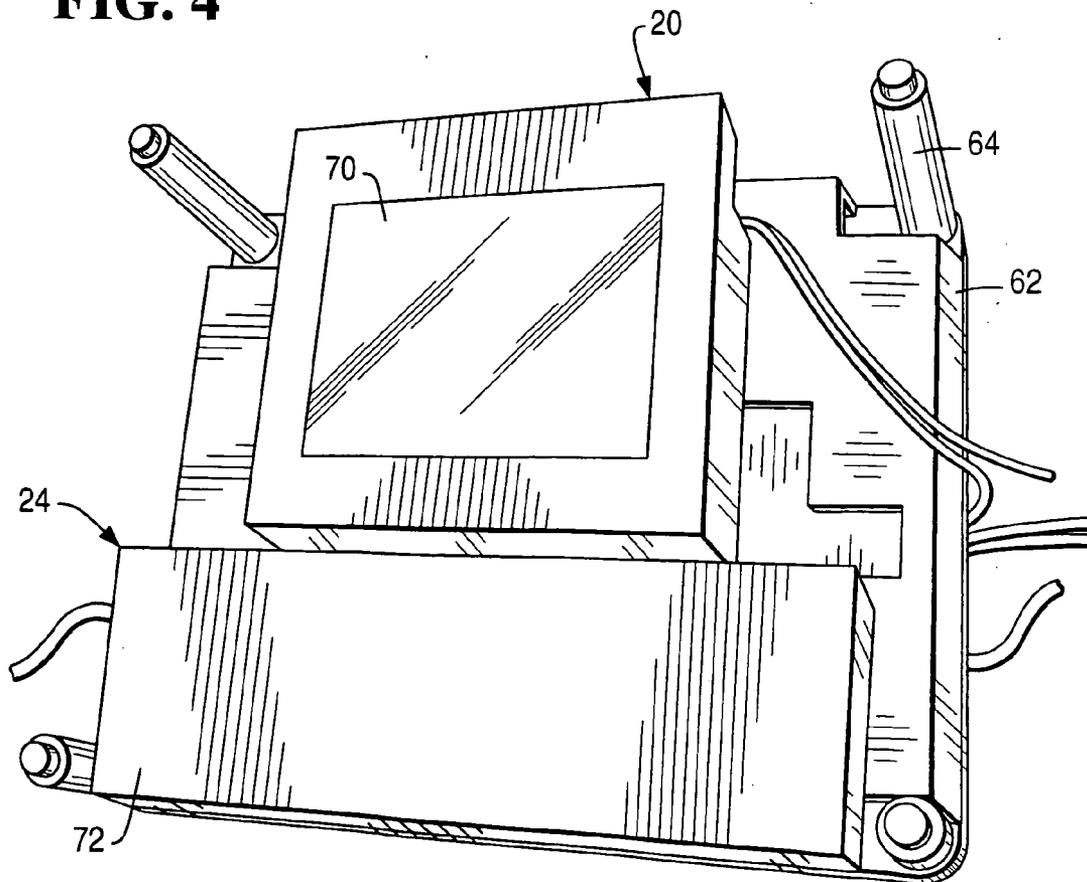
FIG. 2



**FIG. 3**



**FIG. 4**



**CHECKOUT DEVICE INCLUDING INTEGRATED BARCODE READER, SCALE, AND EAS SYSTEM**

**BACKGROUND OF THE INVENTION**

[0001] The present invention relates to product checkout devices and more specifically to a checkout device including integrated barcode reader, scale, and electronic article surveillance (EAS) system.

[0002] Common checkout devices include combinations of barcode readers and scales. One example of such a checkout device is the NCR 7875 checkout device.

[0003] Another example of a checkout device includes a barcode reader and an integrated EAS system and is illustrated in U.S. Pat. No. 5,059,951.

[0004] It would be desirable to produce a checkout device with an integrated barcode reader, scale, and EAS system.

**SUMMARY OF THE INVENTION**

[0005] In accordance with the teachings of the present invention, a checkout device including an integrated barcode reader, scale, and electronic article surveillance (EAS) is provided.

[0006] The checkout device includes a scale assembly including a base portion and a weigh scale over the base portion. The weigh plate includes an aperture. A barcode reader is between the base portion and the weight scale and reads a barcode through the aperture in the weigh plate. A security label deactivation system is between the base portion and the weigh plate.

[0007] The checkout device may be coupled to a point-of-sale (POS) terminal that provides both power and data connections to both the barcode reader and the scale assembly.

[0008] A checkout method includes the steps of reading a barcode label on an item moving in a path, which crosses an aperture of a scale weigh plate by a barcode reader between the aperture and a scale base portion, sending a signal to an interlock by the barcode reader, enabling a security label deactivation system between the scale weigh plate and the scale base portion and in a downstream position from the barcode reader relative to the path of the item, detecting a security label on the item by the security label deactivation system as the item moves along the path and crosses the security label deactivation system, and deactivating the security label by the security label deactivation system.

[0009] It is accordingly an object of the present invention to provide a checkout device including a barcode reader, scale, and an electronic article surveillance EAS system.

[0010] It is another object of the present invention to provide a method of integrating a barcode reader, scale, and an electronic article surveillance EAS system into a single checkout device.

[0011] It is another object of the present invention to provide a method of integrating a barcode reader and an electronic article surveillance system into a scale assembly.

[0012] It is another object of the present invention to provide a checkout device with integrated barcode reader, scale, and electronic article surveillance system that is modular in nature.

[0013] It is another object of the present invention to provide a checkout method involving a checkout device which includes an integrated barcode reader, scale, and electronic article surveillance system.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0014] Additional benefits and advantages of the present invention will become apparent to those skilled in the art to which this invention relates from the subsequent description of the preferred embodiments and the appended claims, taken in conjunction with the accompanying drawings, in which:

[0015] **FIGS. 1A and 1B** are block diagrams first and second examples of a checkout system;

[0016] **FIG. 2** is a wiring-diagram of an example cable connecting a POS terminal to a barcode reader and a scale in accordance with the second example of the present invention;

[0017] **FIG. 3** is a exterior perspective view of a checkout device; and

[0018] **FIG. 4** is a interior view of the checkout device with the scale weigh plate removed.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

[0019] Referring now to **FIGS. 1A and 1B**, checkout system **10** includes point-of-sale (POS) terminal **12** and checkout device **14**.

[0020] POS terminal **12** executes transaction processing software **16**, which records items for purchase and records payment for the items.

[0021] POS terminal **12** additionally includes port **18** to which checkout device **14** is connected. Port **18** may be a serial port, such as an RS232 serial port.

[0022] Checkout device **14** primarily includes barcode reader **20**, scale **22**, and electronic article surveillance (EAS) system **24**.

[0023] Barcode reader **20** reads barcode labels on purchased items. Barcode reader **20** also sends an enable signal to EAS system **24** through interlock **26** following reading. Barcode reader **20** preferably includes primary port **28** for connection barcode reader **20** to port **18** of POS terminal **12**. In addition, barcode reader **20** preferably includes auxiliary port **30** to which other peripherals, such as scale **22** are connected. Primary and auxiliary ports **28** and **30** may be serial ports, such as RS232 serial ports. Barcode reader **20** may include an NCR model 7882 barcode reader.

[0024] Scale **22** weighs purchased produce items. Scale **22** may include a Mettler Toledo model MT8217AS scale.

[0025] EAS system **24** deactivates security labels on purchased items that have them. EAS system **24** senses the presence of a security label and deactivates the security label. EAS system **24** may be connected to auxiliary port **30** or to interlock **26**. If present, interlock **26** activates EAS system **24** in response to an enable system from barcode reader **20**. Thus, interlock **26** signals EAS system **24** to detect a security label only if barcode reader **20** has read a barcode label.

[0026] POS terminal 12 and checkout device 14 may be coupled in various ways. In a first example embodiment (FIG. 1A), cable 40 couples port 18 of POS terminal 12 to primary port 28 of barcode reader 20. Cable 42 couples auxiliary port 30 of barcode reader 20 to port 32 of scale 22 and port 34 of interlock 26.

[0027] Under this example, cables 40 and 42 supply data. Cable 42 additionally supplies power to scale 22 from barcode reader 20.

[0028] Multiple power connections supply power. POS terminal 12 and barcode reader 20 have their own power connections. Interlock 26 and EAS system 24 share another power connection.

[0029] In a second example embodiment (FIG. 1B), cable 44 couples port 18 of POS terminal 12 to port 28 of barcode reader 20 and port 32 of scale 22. Cable 44 supplies power to both barcode reader 20 and scale 22 from POS terminal 12. Thus, one less power connection is required in this example. Different terminal configurations of cable 44 are envisioned. One configuration was designed for the IBM model 46XX terminal (FIG. 2).

[0030] Turning now to FIG. 2, cable 44 is shown in detail. Connector 50 couples to a corresponding connector in port 18 of POS terminal 12. Connector 52 couples to a corresponding connector in port 28 of barcode reader 20. Finally, connector 54 couples to a corresponding connector in port 32 of scale 22.

[0031] Table I below identifies the function of the pins in connector 50:

TABLE I

Pin	Function
1	Logic and Power Ground
4	Terminal Power (connection OK)
3	Data signal + (bi-directional)
2	Data signal - (bi-directional)
S	DC Power +12 volts

[0032] Resistor 56 limits the current flowing from POS terminal to peripherals.

[0033] Turning now to FIGS. 3 and 4, checkout device 14 is shown in more detail.

[0034] Scale 22 includes weigh plate 60, base portion 62, and (4) weigh plate support posts 64. Barcode reader 20 and EAS system 24 are sandwiched between base portion 62 and weigh plate 60. Weigh plate supports 64 float on a load cell assembly within base portion 62.

[0035] Weigh plate 60 includes window 66, which is substantially aligned with window 70 of barcode reader 20. Barcode reader 20 reads barcode labels on items above weigh plate 60 through window 66.

[0036] An example EAS system 24 includes electromagnetic coil 72. Coil 72 may include separate sense and deactivation coils. Corresponding security labels on products include magnetic material. Coil 72 is packaged into a generally rectangular in shape and positioned adjacent barcode reader 20. When mounted in a checkout counter, coil 72 is preferably oriented so that its length dimension is

oriented perpendicular to the direction of product movement (arrow). In this way, security labels are exposed to the electromagnetic field from coil 72 after they are moved across window 66.

[0037] Checkout device 14 is preferably about 11.5 inches in width by 20 inches in length. Advantageously, checkout device 14 fits within a "standard" U.S. checkstand hole for combination barcode reader and scale assemblies.

[0038] In operation, a product bearing a barcode label and a product security label are moved across weigh plate 60 with the barcode label aimed at window 66. Barcode reader 20 reads the barcode label and sends an enable signal to interlock 26. Interlock 26 signals EAS system 24 to detect the product security label. Coil 72 senses the magnetic material in the security label. Coil 72 demagnetizes the magnetic material in the security label.

[0039] Although the invention has been described with particular reference to certain preferred embodiments thereof, variations and modifications of the present invention can be effected within the spirit and scope of the following claims.

1. A checkout device comprising:
  - a scale assembly including a base portion and a weigh scale over the base portion;
  - wherein the weigh plate includes an aperture;
  - a barcode reader between the base portion and the weight scale which reads a barcode through the aperture in the weigh plate;
  - a security label deactivation system; and
  - an interlock which enables the security label deactivation system only after successful reading of the barcode.
2. (canceled)
3. (canceled)
4. (canceled)
5. (canceled)
6. (canceled)
7. (canceled)
8. (canceled)
9. (canceled)
10. (canceled)
11. (canceled)
12. (canceled)
13. (canceled)
14. (canceled)
15. A system for data reading and electronic article surveillance (EAS) tag deactivation, comprising:
  - a housing including a window oriented generally horizontally;
  - a data reader disposed in the housing to read an item through the window as the item is passed through a scan volume defined above the window;
  - an EAS deactivation unit disposed in the housing and to a lateral side of the window; and
  - an interlock which enables the EAS deactivation unit only after successful reading of the item.
16. The system of claim 15 wherein the system is an integrated system for bar code reading and EAS tag deac-

tivation wherein the data reader comprises a bar code reader for reading a barcode label on the item.

17. The system of claim 16 wherein the item is passed through the scan volume in a direction of item movement from a position upstream of the bar code reader to a position downstream of the bar code reader and wherein said one lateral side of the window is downstream of the window.

18. The system of claim 17 wherein the interlock for the EAS deactivation unit is enabled upon receipt of a good read signal from the bar code reader, and wherein the EAS deactivation unit is part of an EAS system which operates to detect an EAS tag only if the barcode reader has successfully read the barcode label.

19. The system of claim 18 wherein the EAS system comprises an electromagnetic coil packaged in a generally rectangular shape package in which the lengthwise dimension of the electromagnetic coil is oriented substantially perpendicular to the direction of item movement.

20. The system of claim 19 wherein the electromagnetic coil comprises separate sense and deactivation coils.

21. The system of claim 16 wherein the integrated system further comprises a weigh scale.

22. The system of claim 15 further comprising:

a weigh plate, the window being disposed in the weigh plate; wherein the EAS deactivation unit is disposed between the weigh plate and the housing.

23. The system of claim 15 further comprising:

a load cell mounted in the housing, the load cell supporting the weigh plate.

24. A checkout system for data reading and electronic article surveillance (EAS) tag deactivation, comprising:

a scanner including a scanner housing which fits within a check stand hole and having a window facing a scan volume through which items are passed;

an EAS deactivation unit disposed in the scanner housing laterally to one side of the window and downstream of the scan volume; and

an interlock which enables the EAS deactivation unit only upon a successful scan of an item passed through the scan volume.

25. The system of claim 24 wherein the window of the scanner is oriented horizontally.

26. A checkout system for data reading and electronic article surveillance (EAS) tag deactivation comprising:

a housing including a window facing a scan volume;

a data reader disposed in the housing to read an item through the window as the item is passed through the scan volume;

an EAS deactivation unit disposed in the housing adjacent to and downstream of the window; and

an interlock which enables the EAS deactivation unit only upon a successful read of an item passed through the scan volume.

27. The system of claim 26 further comprising:

a weigh plate; and

a load cell.

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