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(54) **WIRELESS BARCODE DEVICE**
DRAHTLOSE BARCODEVORRICHTUNG
DISPOSITIF SANS FIL POUR CODES-BARRES

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(73) Proprietor: **Ent. Services Development**
Corporation LP
Houston, TX 77070 (US)

(72) Inventor: **NOWACZYK, David J.**
Pontiac, MI 48341 (US)

(74) Representative: **Zimmermann, Tankred Klaus et al**
Schoppe, Zimmermann, Stöckeler
Zinkler, Schenk & Partner mbB
Patentanwälte
Radtkoferstrasse 2
81373 München (DE)

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Description

Background

[0001] Products often include coded labels, such as barcodes, which are used to identify and track products in shops, supermarkets, warehouses, and other commercial and industrial settings. Stationary or handheld barcode scanners can be used to read the barcode's image data and send the barcode's content out via an output port for analyzing and processing at a processing station.

US 4,766,299 A, against which the claims are delimited, discloses a hand-mounted barcode reader which may be coupled to the hand of a user.

US 7,140,546 B1 discloses a battery pack with integrated human interface devices which are to be coupled to the hand of a user.

Brief Description of the Drawings

[0002]

Figure 1 is a diagram of an example barcode device. Figure 2 is a block diagram of example barcodes configured to be processed by an example barcode device.

Figures 3A and 3B are diagrams of example barcode devices employed with a glove and earpiece.

Figure 4 is a flow diagram illustrating an example method for barcode management.

Figure 5 is a flow diagram illustrating an example method for barcode management using the barcode device.

Detailed Description

[0003] In the following detailed description, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific examples in which the disclosure may be practiced. It is to be understood that other examples may be utilized and structural or logical changes may be made without departing from the scope of the present disclosure. The following detailed description, therefore, is not to be taken in a limiting sense, and the scope of the present disclosure is defined by the appended claims. It is to be understood that features of the various examples described herein may be combined with each other, unless specifically noted otherwise.

[0004] The same assembly line can be used to manufacture products with differing specific features. As an object moves along an assembly line, various individual parts are added to complete the final product. Accordingly, at any given assembly station, there can be multiple parts from which the appropriate part is selected and installed.

[0005] Often the identification and selection of the ap-

propriate part is completed by visual identification by an operator at the assembly station in a two-step process. First, the operator visually identifies the appropriate part being requested on the assembly line product. Second, the operator visually identifies the appropriate part by matching the part requested from a group of nearby parts. Often the parts in the group of parts at a particular assembly station have similar features. For example, emblems to be installed on a vehicle at an assembly station can include 300, 300C, and 300SC. Due to the speed of the assembly line, the operator quickly identifies and selects the appropriate part. When an inappropriate part with an incorrect feature is selected and installed, delays and additional costs are incurred to remove the inappropriate part, repair any damage caused, and install the appropriate part with the correct feature. Often the assembly line is temporarily shut down to complete the corrections.

[0006] In a manufacturing environment, an operator typically wears some type of protective glove. The glove can be fingerless or include covering for all five digits. The glove can be made of a fabric or a knit material made of cotton, for example, or other suitable material. The type of glove depends on the manufacturing task(s) performed by the operator.

[0007] Industrial manufacturing applications can include barcodes to facilitate manufacturing and logistics, for example, on assembly lines. Barcode labels can be attached to individual parts to identify and track parts during a manufacturing process.

[0008] Figure 1 illustrates an example of a barcode processing device 10. Device 10 includes a housing 12 having a first end 14, an opposing second end 16, and a body 18 extending between first end 14 and second end 16. A scanner 20 is positioned at first end 14. Housing 12 holds a processor 34 and a memory 32. Features of these elements can be combined or individually separated. For example, processor 34 can include part or all of memory 32. Aspects are described further below. Device 10 is a wireless device and includes an energy source, such as a battery 28, contained within housing 12. A switch 24 can be positioned on housing 12 to provide a manual activation and deactivation of device 10. An indicator 22 is formed into housing 12 and provides user notification. Additionally, a volume control 26 can be coupled to housing 12 for control of an audible signal.

[0009] As illustrated in Figure 1, housing 12 is a single contiguous body. First end 14 is open, or transparent, to provide an optical opening for scanner 20. In one embodiment, housing 12 is generally linear and can be cylindrical, for example. Generally, a length "L" of body 18 is equal to or less than the distance between a user's metacarpophalangeal joints and wrist. In one embodiment, length "L" of body 18 is approximately 1" (25.4mm) to 3" (76.2mm). Housing 12 has a low profile with length "L" of body 18 being greater than a width or height of body 18. In one embodiment, housing 12 is rigid. Embodiments of housing 12 are made from lightweight and

durable material, such as aluminum or plastic, for example.

[0010] Device 10 is a wireless device. Operation is powered by battery 28, which can be rechargeable. Housing 12 can include a removable portion 30, either at end 16 or along body 18, to allow for battery replacement. Alternatively, device 10 is rechargeably power operated and end 16 includes a port for connection to a charging docking station. In one embodiment, device 10 remains activated for the entire time in use, for example, the length of a work shift. In one embodiment, switch 24 is a toggle style switch that is depressed by a user to power device 10 on and off.

[0011] Scanner 20 can be selected from available forms of barcode scanners, or barcode readers, and is an electronic device for reading printed barcodes. For example, scanner 20 can be a laser scanner, a Charge Coupled Device (CCD) scanner, or other type of available scanners. Scanner 20 will typically include a light source, a lens and a light sensor. Scanner 20 can be a pen or wand-type reader wherein in the operator swipes the pen over the barcode. In a pen reader, for example, a light source and a photodiode are placed next to each other in the tip of the reader and the operator moved the reader across the bars of the barcode in a steady motion. In a wand-type laser scanner, a laser beam is the light source and the either a reciprocating mirror or a rotating prism is used to scan the laser beam back and forth across the barcode; a photodiode is used to measure the intensity of the light reflected back from the barcode. In a CCD scanner, for example, multiple tiny light sensors are lined up in a row in the head of the reader.

[0012] Memory 32 can include memory storage suitable for a 24 hour work shift, for example. In one embodiment, memory 32 includes eight gigabytes of memory storage, although other storage amounts are suitable depending on the particular application. Processor 34 includes comparison based capabilities. Processor 34 uses a suitable software application stored in memory 32. Processor 34 receives raw image data from the scanned barcode and processes the data in accordance with software instructions of generate a "received", "match", "non-match", or other appropriate output signal programmed to be associated with the barcode data. For example, once a set of barcodes has been scanned, electrical signals are communicated to processor 34, and through software, a second barcode matching, or not matching, a first barcode is identified.

[0013] Processor 34 can include writable and readable memory. In one embodiment, processor 34 receives data related to the barcodes from a computing system. In one embodiment, processor 34 retains and tracks data related to received, match, and non-match barcode scans. In one embodiment, the retained data can be downloaded to a computing system through a wireless transmission or by docking the device. In one embodiment, device 10 can provide audit reporting of the scanned and retained data. In one embodiment, device 10 is coupled to a dock-

ing station to transfer data and programming information and refresh the data storage of processor 34. Alternatively, the data can be transferred wirelessly. Device 10 operates in wireless networks according to IEEE 802.11g Wireless Local Area Network (WLAN) or IEEE 802.15.3 (Bluetooth®), for example.

[0014] A signal notification is generated by processor 34 and produced by indicator 22, based on the barcode data received. In one embodiment, indicator 22 emits an audible signal notification. Indicator 22 can include a speaker within housing 12 to provide the audible signal notification. Alternatively, and with reference to Figures 3A and 3B, device 10 can wirelessly transmit, by Bluetooth®, for example, the audible signal notification to an earpiece 52 worn by the operator. Device 10 can wirelessly interface with earphone 52 to notify the operator of received barcode data, matching or non-matching barcode. With reference to Figure 1, volume control 26 can be included on housing 12 when indicator 22 produces an audible signal notification.

[0015] Alternatively, or in addition, indicator 22 includes a visual signal such as a light. In one embodiment, indicator 22 illuminates to notify the operator of a received barcode data, a barcode match, a barcode non-match, or other appropriate information. In one embodiment, indicator 22 illuminates in one of a variety of colors or patterns to indicate either a first barcode data received, a match of a second barcode data to the first barcode data, or a non-match of the second barcode data to the first barcode data. In one embodiment, indicator 22 includes a small Light Emitting Diode (LED) display which can provide word messages.

[0016] Figure 2 illustrates a block diagram of barcodes configured to be processed by device 10. A barcode 40 is on a first label 42. A group of second barcodes 44a, 44b, 44c are on a group of corresponding second labels 46a, 46b, 46c. Barcode 44c of the second group of barcodes 44a, 44b, 44c is a match (represented by solid line 50) to barcode 40. Barcodes 44a and 44b of the second group of barcodes 44a, 44b, 44c are non-matches (represented by dashed lines 48) to barcode 40. In one example of a manufacturing assembly line environment, labels 42, 46a, 46b, and 46c are on product parts and barcodes 40, 44a, 44b, and 44c are product part barcodes.

[0017] Figures 3A and 3B illustrates examples of device 10 used with a glove 54 and earpiece 52. Device 10 is coupled to glove 54 to be worn by an operator. As discussed above, glove 54 is flexible and made of any type of material suitable for protection and for accomplishing the operator's tasks. Device 10 is positioned on the back of an operator's hand on glove 54 with first end 14 oriented toward the fingers. In this manner, the operator's hands remain free to handle objects or goods while scanning or completing other tasks. The operator will not have to remove glove 54 to perform typical manual tasks such as operating machinery, lifting objects, assembling products because glove 54 positions device 10 in a way

that allows normal use of the operator's hand and arm.

[0018] Device 10 is suitable to be attached to any sized glove, thus operators of various hand size can use device 10. Device 10 is securely and removably attached to glove 54. Device 10 is securely attached to glove 54 with attachment mechanism 56. In one embodiment, as illustrated in Figure 3A, attachment mechanism 56 includes at least one strap or band extending to and/or around glove 54 or a bare hand of the operator. In another embodiment, as illustrated in Figure 3B, attachment mechanism includes a pocket 56a that houses device 10. Pocket 56a can be of a transparent material or open at one end to provide an optical opening for scanner 20. Other suitable attachment mechanisms 56 can be employed that securely and removably attach device 10 to glove 54. Attachment mechanism 56 is configured to provide against dislodgement of device 10 during hand movements of the operator, while allowing for device 10 to be uncoupled when desired.

[0019] Figure 4 illustrates a flow chart of an example method 60 of product management using barcode device 10. Method 60 can be a method for managing manufacturing a product on an assembly line. At 62, a first barcode is scanned. The results of the scan are first raw signal data. At 64, first barcode data is processed and stored. Raw barcode data signals are transformed into processed barcode data signals. At 66, a first user notification is generated. First user notification indicates receipt status by the device of first barcode data. At 68, one of a group of second barcodes is scanned. The results of the scan are second raw signal data. At 70, one of the group of second barcodes data is processed. The second raw barcode data signals are transformed into processed barcode data signals and compared to the first processed barcode data. At 72, a second user notification is generated. Second user notification indicates receipt status of second barcode data and/or a match or non-match of the one of the group of second barcode data to the first barcode data.

[0020] Figure 5 is a flow diagram illustrating an example method 80 of barcode management using device 10. Method 80 can begin at step 82 where processor 34 of device 10 determines if a one of a group of second barcodes matches a first scanned barcode. When a non-match is determined, method 80 can proceed to step 84. When a match is determined, method 80 can proceed to step 90. In step 90, a match signal is generated. If the data of the second barcode matches the data of the first barcode, a match signal is generated to notify the operator. In step 84, a non-match signal is generated. If the data of the second barcode does not match the data of the first barcode, a non-match signal is generated to notify the operator. In step 86, a next one of the group of second barcodes is scanned. In step 88, processor 40 determines if the next one of the group of second barcodes matches the first scanned barcode. When a non-match is determined, method 80 can proceed to step 84. When a match is determined, method 80 can proceed to

step 90. Method 80 continues until such time as a barcode match occurs. Method 80 is terminated by a barcode match reading. Method 80 can be restarted with a new first barcode scan. Method 80 can be employed for managing manufacturing a product on an assembly line, for example.

[0021] Although specific examples have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or equivalent implementations may be substituted for the specific examples shown and described without departing from the scope of the present disclosure. This application is intended to cover any adaptations or variations of the specific examples discussed herein. Therefore, it is intended that this disclosure be limited only by the claims.

Claims

1. A barcode device (10), comprising:
 - a barcode scanner (20) to scan barcode labels (46, 46a-46c) and provide raw barcode data signals;
 - a processor (34) to receive and process the raw barcode data signals to provide processed barcode data signals and compare at least two of the processed barcode data signals;
 - an indicator (22) to notify a user of barcode data information based on the receipt of barcode data and comparison performed by the processor (34);
 - a housing (12) to contain the barcode scanner (20), the processor (34), and the indicator (22), the housing (12) comprising a first end (14), an opposing second end (16), and a body (18) extending between the first end (14) and the second end (16), the housing (12) configured to couple to a back of a glove (54); and
 - characterized by** an attachment mechanism (56) to securely and removably attach the device (10) to the glove (54).
2. The device of claim 1, wherein the body of the housing is generally cylindrical.
3. The device of claim 1, wherein the body has a length of approximately 1" (25.4mm) to 3" (76.2mm).
4. The device of claim 1, wherein the indicator is configured to produce a group of programed signals.
5. The device of claim 1, wherein the indicator (22) is a visual indicator.
6. The device of claim 1, wherein the indicator is an audible indicator.

7. The device of claim 6, comprising:
a volume control (26) on the housing (12).
8. The device of claim 6, comprising:
an earpiece (52) to receive and produce the audible indication. 5
9. The device of claim 1, wherein the barcode scanner (22) is positioned at the first end (14) of the housing (12). 10
10. The device of claim 1, wherein the processor (34) is to produce audit reporting of scanned data.
11. A system comprising: 15
 - a glove (54); and
 - a barcode device (10) according to any of the preceding claims. 20
12. A method for managing manufacturing a product on an assembly line, the method comprising:
 - providing a barcode device according to any of claims 1 to 10; 25
 - scanning (62) a first barcode with the barcode scanner;
 - processing data (64) corresponding to the scanned first barcode;
 - producing (66) a first user notification of the first barcode data received; 30
 - scanning (68) at least one of a group of second barcodes with the barcode scanner;
 - processing (70) scanned data corresponding to each of the at least one of the group of second barcodes; 35
 - producing (72) a second user notification indicating one of a non-match and match for each of the at least one second barcodes to the first barcode. 40
13. The method of claim 12, wherein the indicator (22) provides visual user notifications.
14. The method of claim 12, wherein the user notifications are wirelessly transmitted to an earpiece (52). 45
15. The method of claim 12, comprising:
attaching the barcode device (10) to a glove (54). 50

Patentansprüche

1. Eine Barcode-Vorrichtung (10), die folgende Merkmale aufweist: 55
 - einen Barcode-Scanner (20) zum Scannen von Barcode-Etiketten (46, 46a-46c) und Bereitstel-

len von rohen Barcode-Datensignalen;
einen Prozessor (34) zum Empfangen und Verarbeiten der rohen Barcode-Datensignale, um verarbeitete Barcode-Datensignale bereitzustellen und zumindest zwei der verarbeiteten Barcode-Datensignale zu vergleichen;
einen Indikator (22) zum Benachrichtigen eines Benutzers über Barcode-Dateninformationen basierend auf dem Empfang von Barcode-Daten und dem Vergleich, der durch den Prozessor (34) durchgeführt wird;
ein Gehäuse (12) zum Beinhaltenden des Barcode-Scanners (20), des Prozessors (34) und des Indikators (22), wobei das Gehäuse (12) ein erstes Ende (14), ein gegenüberliegendes zweites Ende (16) und einen Körper (18) aufweist, der sich zwischen dem ersten Ende (14) und dem zweiten Ende (16) erstreckt, wobei das Gehäuse (12) ausgebildet ist, um mit einer Rückseite eines Handschuhs (54) gekoppelt zu sein; und
gekennzeichnet durch einen Anbringungsmechanismus (56) zum sicheren und entfernbaren Anbringen der Vorrichtung (10) an dem Handschuh (54).

2. Die Vorrichtung gemäß Anspruch 1, bei der der Körper des Gehäuses im Allgemeinen zylindrisch ist.
3. Die Vorrichtung gemäß Anspruch 1, bei der der Körper eine Länge von etwa 1 Zoll (25,4 mm) x 3 Zoll (76,2 mm) aufweist.
4. Die Vorrichtung gemäß Anspruch 1, bei der der Indikator ausgebildet ist, um eine Gruppe programmierter Signale zu erzeugen.
5. Die Vorrichtung gemäß Anspruch 1, bei der der Indikator (22) ein visueller Indikator ist.
6. Die Vorrichtung gemäß Anspruch 1, bei der der Indikator ein hörbarer Indikator ist.
7. Die Vorrichtung gemäß Anspruch 6, die folgendes Merkmal aufweist:
eine Lautstärkeregelung (26) an dem Gehäuse (12).
8. Die Vorrichtung gemäß Anspruch 6, die folgendes Merkmal aufweist:
einen Hörer (52) zum Empfangen und Erzeugen der hörbaren Anzeige.
9. Die Vorrichtung gemäß Anspruch 1, bei der der Barcode-Scanner (22) an dem ersten Ende (14) des Gehäuses (12) positioniert ist.
10. Die Vorrichtung gemäß Anspruch 1, bei der der Prozessor (34) einen Prüfbericht gescannter Daten erzeugen soll.

11. Ein System, das folgende Merkmale aufweist:

einen Handschuh (54); und
eine Barcode-Vorrichtung (10) gemäß einem
der vorherigen Ansprüche.

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12. Ein Verfahren zum Verwalten der Fertigung eines Produkts an einer Fertigungslinie, wobei das Verfahren folgende Schritte aufweist:

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Bereitstellen einer Barcode-Vorrichtung gemäß einem der Ansprüche 1 bis 10;
Scannen (62) eines ersten Barcodes mit dem Barcode-Scanner;
Verarbeiten von Daten (64), die dem gescannten ersten Barcode entsprechen;
Erzeugen (66) einer ersten Benutzerbenachrichtigung über die empfangenen ersten Barcode-Daten;
Scannen (68) zumindest eines einer Gruppe zweiter Barcodes mit dem Barcode-Scanner;
Verarbeiten (70) gescannter Daten, die jedem des zumindest einen der Gruppe zweiter Barcodes entsprechen;
Erzeugen (72) einer zweiten Benutzerbenachrichtigung, die entweder eine Nicht-Übereinstimmung oder eine Übereinstimmung für jeden des zumindest einen zweiten Barcodes mit dem ersten Barcode anzeigt.

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13. Das Verfahren gemäß Anspruch 12, bei dem der Indikator (22) visuelle Benutzerbenachrichtigungen bereitstellt.

14. Das Verfahren gemäß Anspruch 12, bei dem die Benutzerbenachrichtigungen drahtlos an einen Hörer (52) übertragen werden.

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15. Das Verfahren gemäß Anspruch 12, das folgenden Schritt aufweist:
Anbringen der Barcode-Vorrichtung (10) an einem Handschuh (54).

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Revendications

1. Dispositif de codes-barres (10), comprenant:

un lecteur de code-barres (20) destiné à balayer des étiquettes à code-barres (46, 46a à 46c) et à fournir des signaux de données de code-barres bruts;
un processeur (34) destiné à recevoir et à traiter les signaux de données de code-barres bruts pour fournir des signaux de données de code-barres traités et à comparer au moins deux des signaux de données de code-barres traités;
un indicateur (22) destiné à notifier à un utilis-

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teur des informations de données de code-barres sur base de la réception des données de code-barres et de la comparaison effectuée par le processeur (34);
un boîtier (12) destiné à contenir le lecteur de code-barres (20), le processeur (34) et l'indicateur (22), le boîtier (12) comprenant une première extrémité (14), une deuxième extrémité opposée (16) et un corps (18) s'étendant entre la première extrémité (14) et la deuxième extrémité (16), le boîtier (12) étant configuré pour être couplé à l'arrière d'un gant (54); et
caractérisé par un mécanisme de fixation (56) destiné à fixer de manière sûre et amovible le dispositif (10) au gant (54).

2. Dispositif selon la revendication 1, dans lequel le corps du boîtier est généralement cylindrique.

3. Dispositif selon la revendication 1, dans lequel le corps présente une longueur d'environ 1" (25,4 mm) à 3" (76,2 mm).

4. Dispositif selon la revendication 1, dans lequel l'indicateur est configuré pour produire un groupe de signaux programmés.

5. Dispositif selon la revendication 1, dans lequel l'indicateur (22) est un indicateur visuel.

6. Dispositif selon la revendication 1, dans lequel l'indicateur est un indicateur audible.

7. Dispositif selon la revendication 6, comprenant: une commande de volume (26) sur le boîtier (12).

8. Dispositif selon la revendication 6, comprenant: un écouteur (52) destiné à recevoir et produire l'indication audible.

9. Dispositif selon la revendication 1, dans lequel le lecteur de codes-barres (22) est positionné à la première extrémité (14) du boîtier (12).

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10. Dispositif selon la revendication 1, dans lequel le processeur (34) doit produire un rapport d'audit des données balayées.

11. Système comprenant:

un gant (54); et
un dispositif de codes-barres (10) selon l'une quelconque des revendications précédentes.

12. Procédé de gestion de fabrication d'un produit sur une ligne de montage, le procédé comprenant le fait de:

- prévoir un dispositif de codes-barres selon l'une quelconque des revendications 1 à 10;
 balayer (62) un premier code-barres par le lecteur de code-barres;
 traiter les données (64) correspondant au premier code-barres balayé;
 produire (66) une première notification à l'utilisateur des premières données de code-barres reçues;
 balayer (68) au moins l'un parmi un groupe de deuxièmes codes-barres par le lecteur de code-barres;
 traiter (70) les données balayées correspondant à chacun des au moins un parmi le groupe de deuxièmes codes-barres;
 produire (72) une deuxième notification à l'utilisateur indiquant l'une parmi une non-coïncidence et une coïncidence pour chacun des au moins un deuxième code-barres avec le premier code-barres.
13. Procédé selon la revendication 12, dans lequel l'indicateur (22) fournit des notifications visuelles à l'utilisateur.
14. Procédé selon la revendication 12, dans lequel les notifications à l'utilisateur sont transmises sans fil à un écouteur (52).
15. Procédé selon la revendication 12, comprenant le fait de:
 fixer le dispositif de codes-barres (10) à un gant (54).

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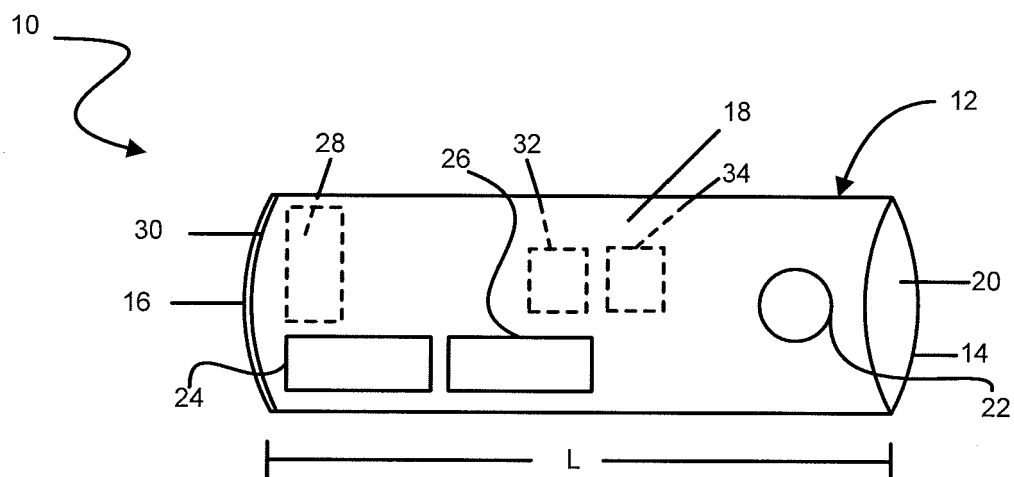


Figure 1

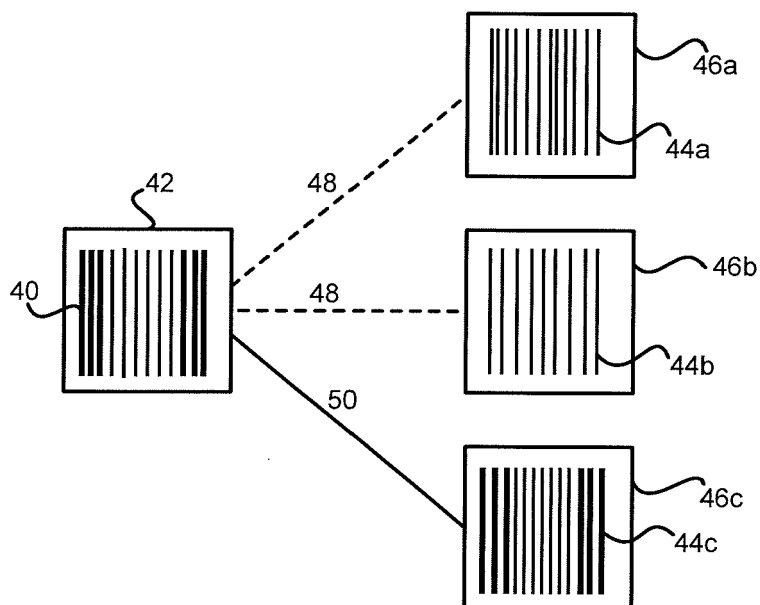


Figure 2

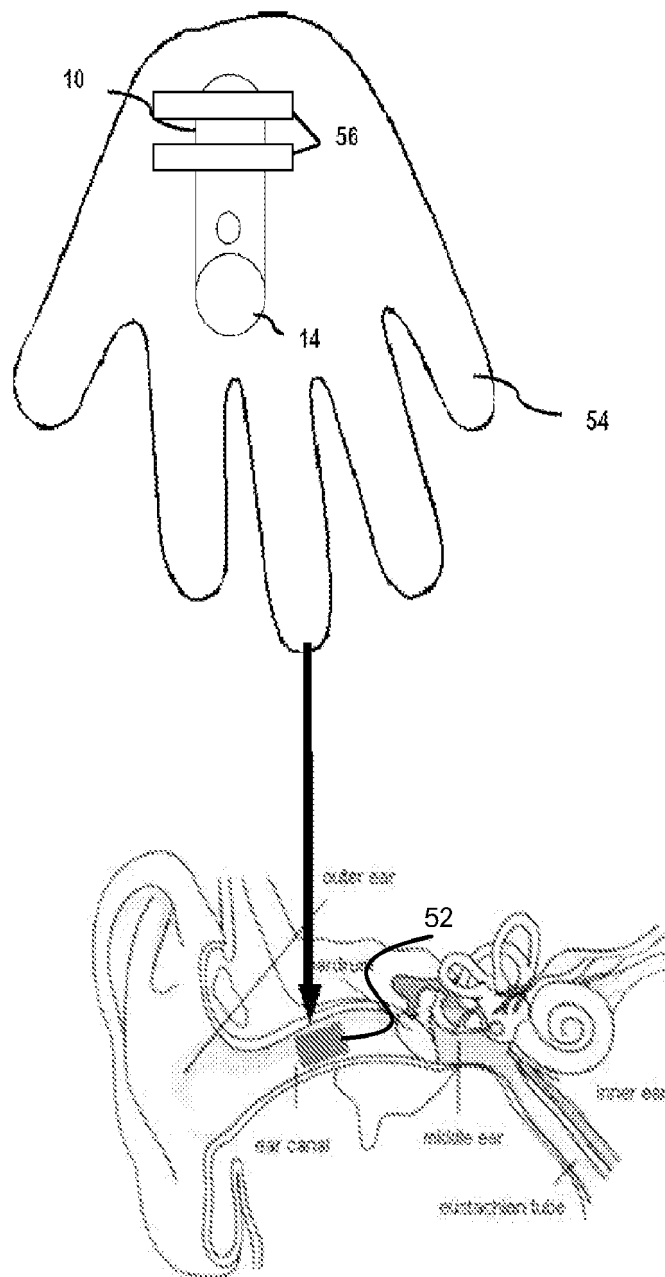


Figure 3A

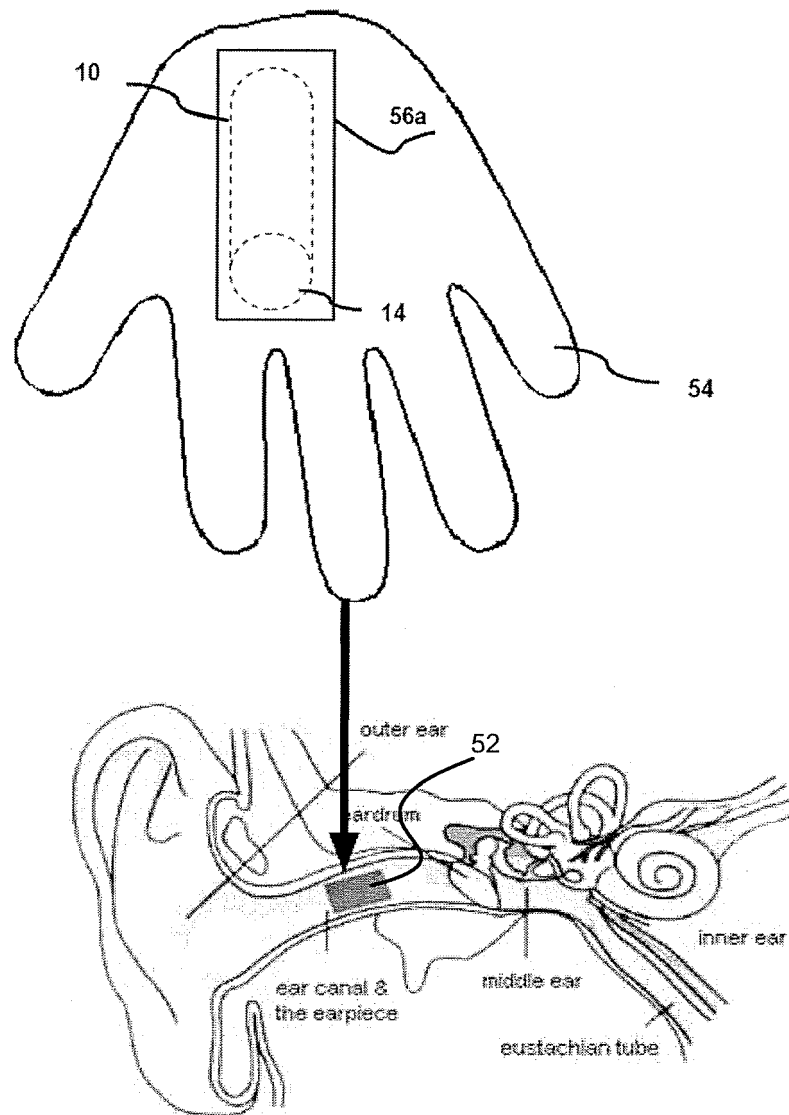


Figure 3B

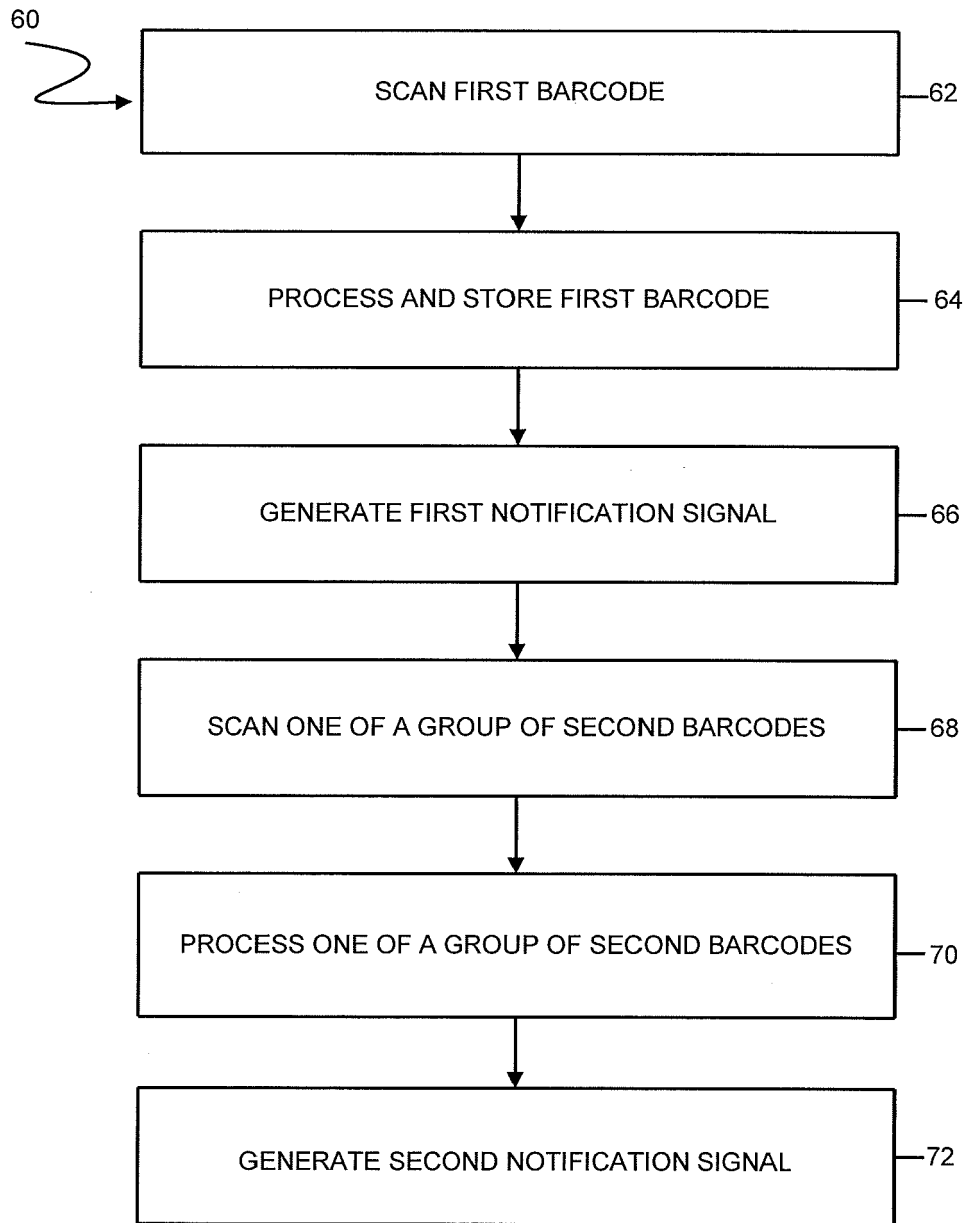


Figure 4

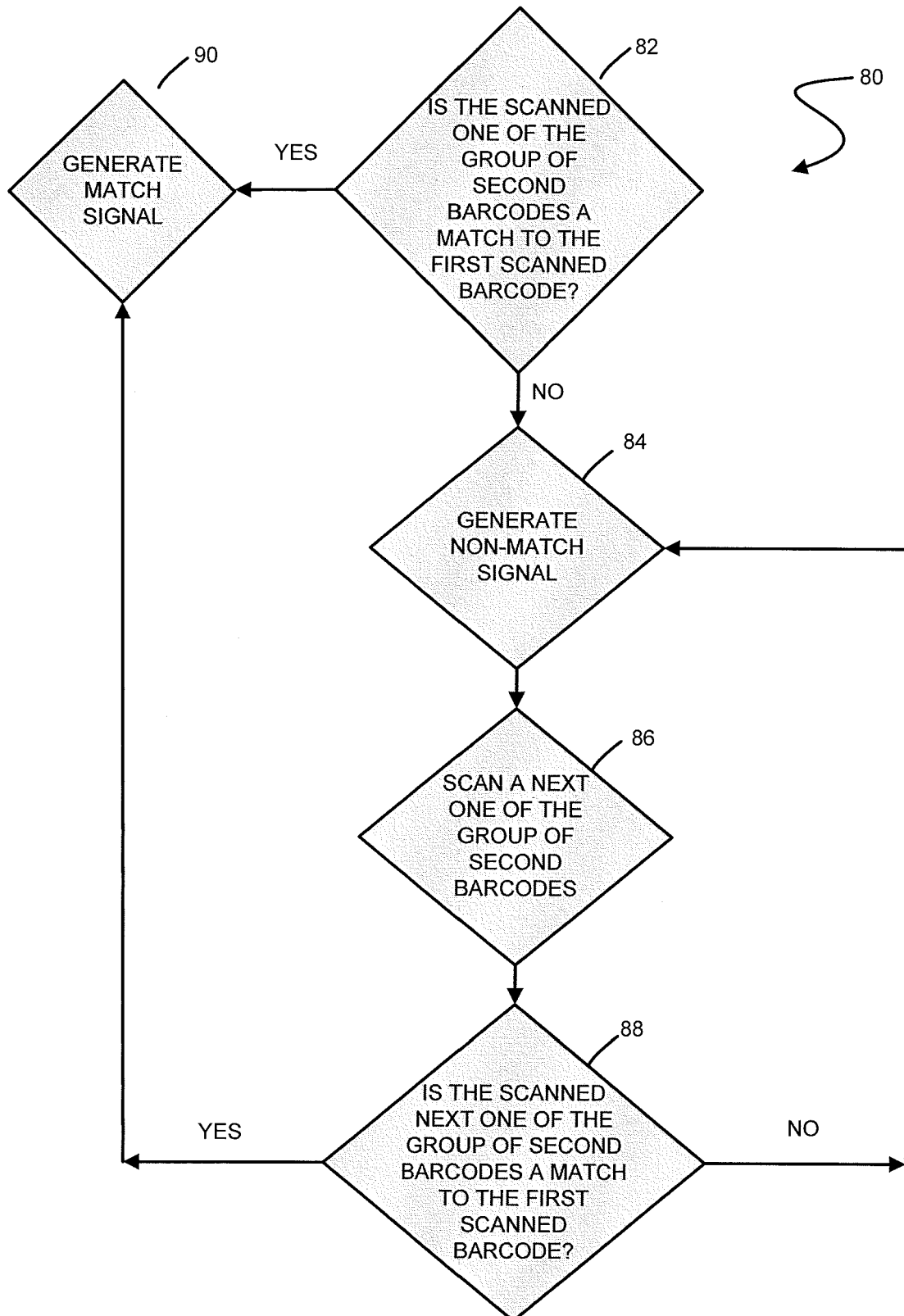


Figure 5

REFERENCES CITED IN THE DESCRIPTION

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