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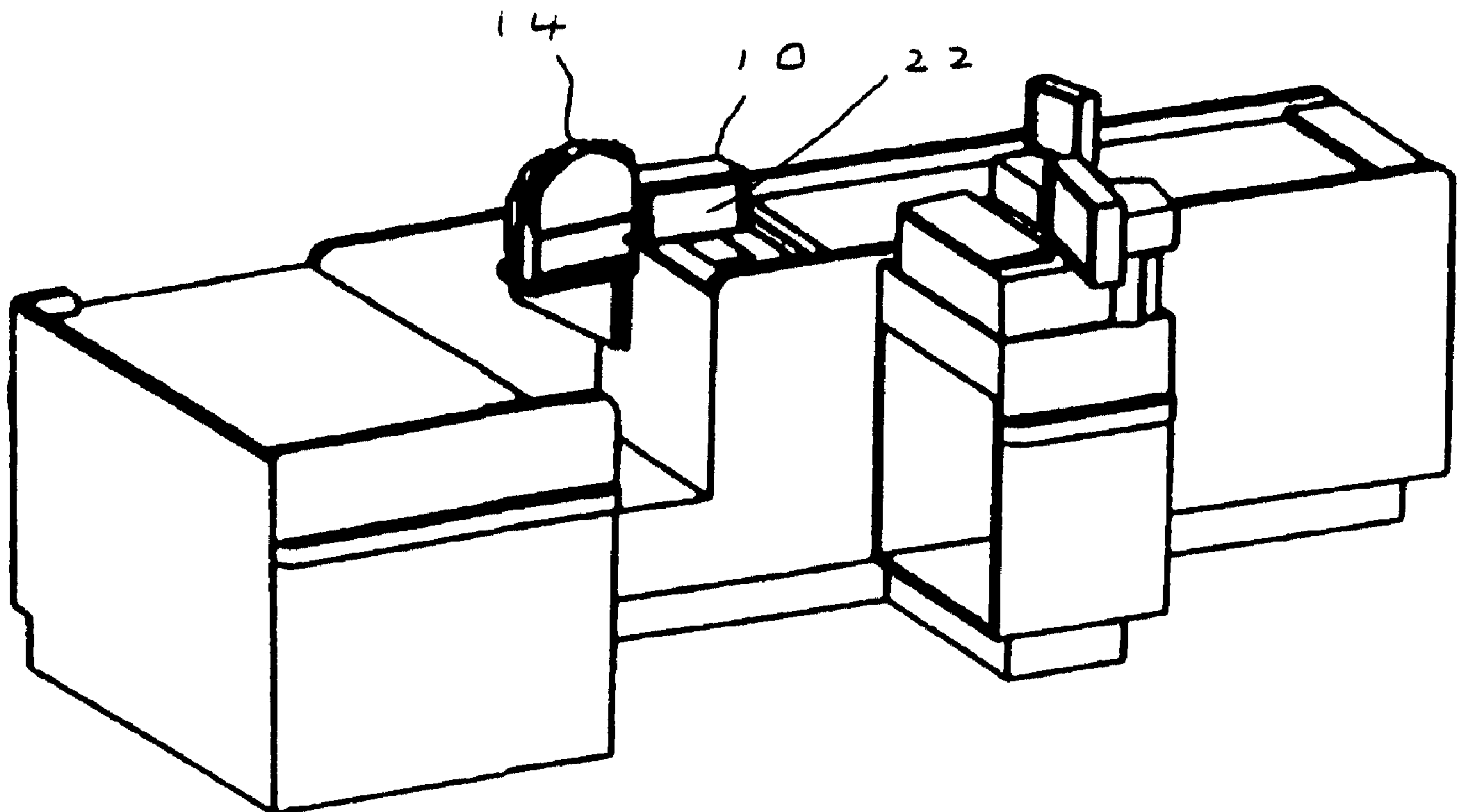
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(54) Title: SECURITY SYSTEMS FOR INHIBITING THEFT OF GOODS FROM RETAIL STORES



(57) Abrégé/Abstract:

A checkout system for a retail store is disclosed which comprises a bar code reader (10) and an anti-theft tag deactivator (14). The bar code reader produces a signal upon the bar code on an article being read successfully by the reader. This signal is used to enable the deactivator for a predetermined period of time whereafter the deactivator is disabled until the next successful bar code read. This minimises the prospects of a cashier being able to deactivate the anti-theft tag on an article without having read the bar

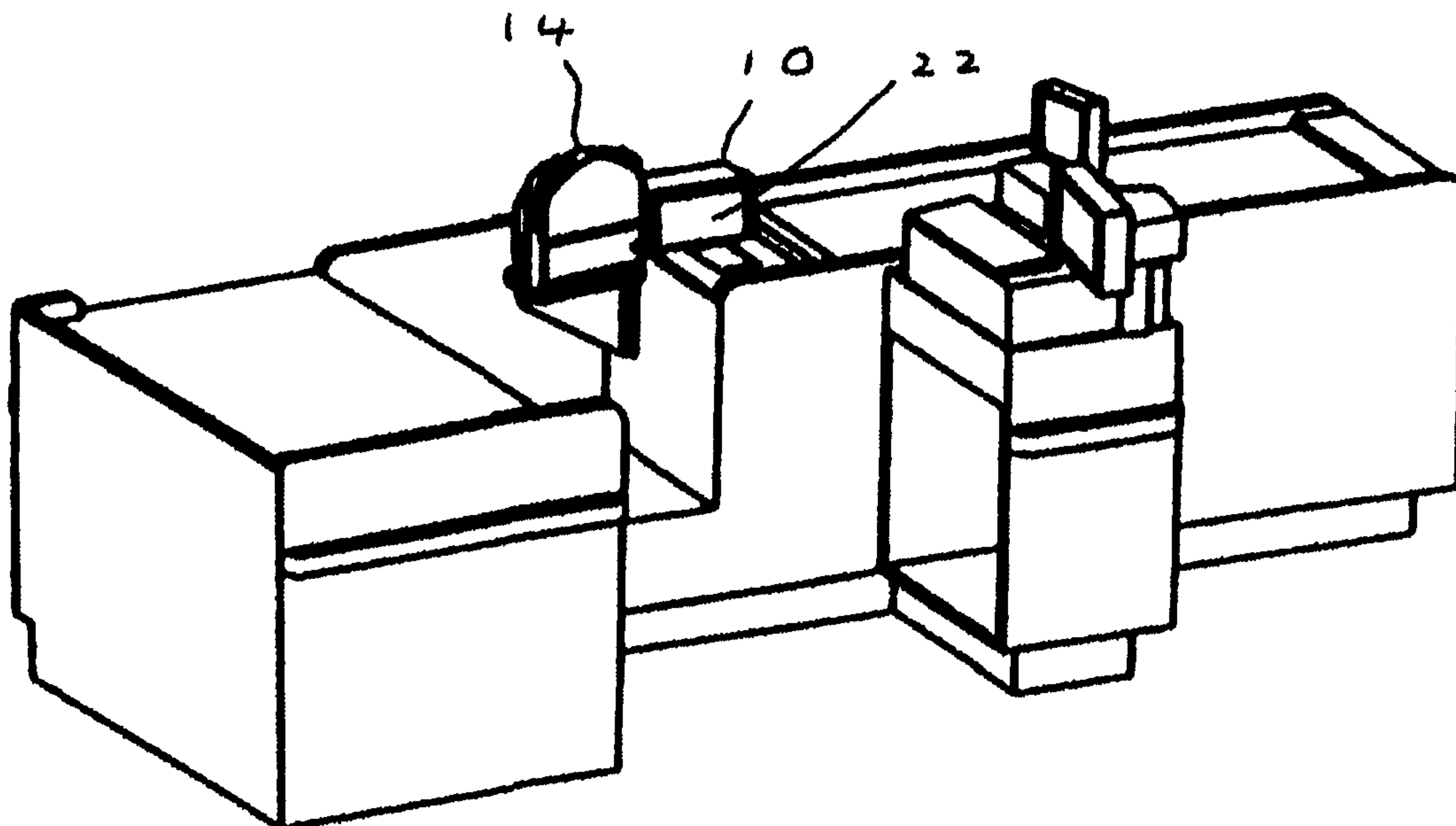
(57) **Abrégé(suite)/Abstract(continued):**

code on the article and hence entered the sale. The system can also include a microswitch for detecting closing and opening of the cash drawer. If the drawer is left open, but the bar codes on articles are read by the bar code reader, this can indicate the possibility of goods being fraudulently removed from the store.

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(54) Title: SECURITY SYSTEMS FOR INHIBITING THEFT OF GOODS FROM RETAIL STORES**(57) Abstract**

A checkout system for a retail store is disclosed which comprises a bar code reader (10) and an anti-theft tag deactivator (14). The bar code reader produces a signal upon the bar code on an article being read successfully by the reader. This signal is used to enable the deactivator for a predetermined period of time whereafter the deactivator is disabled until the next successful bar code read. This minimises the prospects of a cashier being able to deactivate the anti-theft tag on an article without having read the bar code on the article and hence entered the sale. The system can also include a microswitch for detecting closing and opening of the cash drawer. If the drawer is left open, but the bar codes on articles are read by the bar code reader, this can indicate the possibility of goods being fraudulently removed from the store.

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SECURITY SYSTEMS FOR INHIBITING THEFT
OF GOODS FROM RETAIL STORES

FIELD OF THE INVENTION

THIS INVENTION relates to security systems for inhibiting theft of
5 goods from retail stores.

BACKGROUND TO THE INVENTION

A commercially used system for inhibiting the theft of goods from retail stores comprises tagging each article with a tag which, unless deactivated by an authorized employee, triggers an alarm at the store exit. The tag is tuned to react to
10 signals emitted by security devices located at the exits of the retail store. The signals can, for example, be radio frequency signals at 58kHz. Upon being subjected to a signal of this frequency, the tag vibrates transmitting a signal to a receiver of the adjacent security device whereupon an alarm is activated. To deactivate the tag its response frequency is altered using suitable equipment. For
15 example, the response frequency of the tag can be changed from 58kHz to 60kHz. When the article with the deactivated tag attached is taken out of the retail store, the tag remains passive as it now requires a signal of 60kHz to activate it. The response frequency of the tag can subsequently be changed back to 58kHz thereby enabling the tag to be used again. This feature is particularly necessary when
20 goods, such as video cassettes, are repeatedly rented out but must be protected whilst in the store.

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This system can be circumvented when the cashier at the checkout is in collusion with the customer. The simplest way of defeating the system is for the tag on the article to be deactivated but not rung up on the till or "swiped" over the bar code reader. Hence the article does not appear on the customer's till slip but can still safely be taken out of the store. The present invention seeks to counter this type of theft.

Another problem that retail outlets have is theft of monies paid over by customers to cashiers. One way in which a cashier can steal is, after finalizing a transaction, not to close the cash drawer fully. The next customer's goods are then "swiped" over the bar code reader, not as a sale but as a price enquiry. This results in an entry on the till slip but nothing on the journal roll. The customer is thus satisfied that the correct amounts have been charged, nothing has been entered on the journal roll and the cashier can keep the cash knowing that there is no imbalance in the records and no cash shortage in the drawer. The present invention also seeks to make thefts of this type more difficult to perpetrate successfully.

SUMMARY OF THE INVENTION

According to one aspect of the present invention, there is provided a checkout system to non-invasively interface a bar code reader to an anti-theft tag deactivator, comprising: a bar code reader for reading indicia associated with an article and generating a first signal indicating a successful read of the indicia; non-invasive interface means for sensing said first signal disposed within a preselected distance of said bar code reader, said sensing means generating a second signal upon sensing said first signal, said means for sensing

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said first signal and said means for generating said second signal are electrically separate; and, an anti-theft tag deactivator, said anti-theft tag deactivator being activated for a predetermined period when triggered by said second
5 signal.

According to another aspect of the present invention, there is provided a method to non-invasively interface a point-of-sale reader to an anti-theft tag deactivator, comprising: reading indicia associated with an article and generating a
10 first signal; non-invasively sensing said first signal and generating a second signal wherein said first signal is electrically separate from said second signal; and receiving said second signal and deactivating an anti-theft tag.

BREIF DESCRIPTION OF THE INVENTION

15 According to one aspect of the present invention there is provided a checkout system for a retail store, the system including:

a bar code reader which generates a signal each time there is a successful swipe across the reader, and which signal
20 is used to cause an audible "beep" to be emitted; and

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an anti-theft tag deactivator which is switched into an enabled condition for a predetermined period each time said signal is generated.

According to a further aspect of the present invention there is provided a checkout system for a retail store, the system comprising;

5 a bar code reader including means for generating a signal each time there is a successful swipe across the reader, the reader including means for emitting an audible sound each time said signal is generated;

a control unit;

means for feeding an operating signal to said control unit each time the
10 successful swipe signal is generated; and

an anti-theft tag deactivator connected to said control unit and having an enabled condition in which it deactivates a tag presented thereto and a disabled condition in which it does not deactivate a tag presented thereto, said unit generating an enable signal which switches said deactivator to its enabled condition
15 for a predetermined period of time upon an operating signal being fed to the control unit.

Said operating signal can be tapped-off the bar code reader's electronic circuitry or an acoustic pick-up can be used to detect said sound and generate said operating signal. If an acoustic pick-up is used it can be a
20 microphone attached to the housing of the bar code reader.

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An advantage of using an acoustic pick-up is that it prevents the necessity of tampering with the bar code reader's circuitry. However, the frequency of the acoustic signal used in commercial bar code readers varies which can complicate tuning the acoustic pick-up to the correct frequency.

5 According to a further aspect of the present invention there is provided a checkout system for a retail outlet, the system comprising a cash drawer and means for producing a first signal indicative of the cash drawer being fully closed, a bar code reader which generates a second signal each time that an article is "swiped" across it and the bar code is read successfully, and means responsive to
10 said signals for establishing an alarm condition in the event that a second signal is received in the absence of a first signal.

 According to another aspect of the present invention there is provided a method of countering theft of an article from a retail store which article carries a tag that, unless deactivated, triggers an anti-theft alarm at a store exit, the method
15 comprising swiping the article across a bar code reader to read a bar code carried by the article, using the signal generated by the bar code reader upon a successful swipe to enable a tag deactivator for a predetermined period of time, and disabling said deactivator at the end of said predetermined period of time.

BRIEF DESCRIPTION OF THE DRAWINGS

20 For a better understanding of the present invention, and to show how

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the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:-

Figure 1 is a pictorial view of a checkout at a retail store;

Figure 2 is a diagrammatic representation of a checkout; and

5 Figure 3 is a block diagram.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring firstly to Figures 1 and 2, the checkout illustrated comprises a bar code reader 10 over which articles being checked out are swiped. If the bar code reader 10 fails successfully to read the bar code, which can happen for a number of reasons, the bar code reader 10 remains entirely passive and does not react to the fact that an article has been swiped. The article has to be swiped until there is a successful read. The cashier and customer know that this has happened because the bar code reader 10 generates a signal which is fed to a speaker or piezo electric device 12 and is emitted as an audible beep.

15 Reference numeral 14 designates an anti-theft tag deactivator. The bar code reader 10 and deactivator 14 are placed adjacent one another so that the cashier, in one sweeping motion along the path indicated at P (Figure 2), can move the article across the bar code reader 10 and then bring the tag within the field generated by the deactivator 14.

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A processing unit 16 (which will be described in more detail hereinafter with reference to Figure 3) is connected by a line 18 to an acoustic pick-up 20. The pick-up 20 is attached to the casing 22 of the bar code reader 10 adjacent the speaker or piezo electric device 12 which emits the audible beep. The device 12 and the pick-up 20 are preferably on the rear of the casing 22 of the reader 10.

The unit 16 receives a signal each time an audible beep is "heard" by the pick-up 20. For a period of, for example, two seconds after the signal from the pick-up 20 reaches the unit 16, the unit 16 generates a signal which is fed along a line 24 to a port on the deactivator 14. This signal switches the deactivator 14 to its enabled condition in which it will deactivate a tag, and holds it in that condition for the duration of the signal. The duration of the signal is long enough to enable the article to be moved along the path designated P but too short to allow another article to be moved into range of the deactivator's field whilst bypassing the bar code reader 10.

In summary, each successful swipe across the bar code reader 10 enables the deactivator 14 for a brief period of time. Any effort by the cashier to move two articles past the deactivator 14 after having swiped only one of them over the bar code reader 10 is difficult and moreover can be detected on surveillance cameras.

Many bar code readers include a LED, usually green, which lights up

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to give a visual indication of a successful swipe. The signal to this LED can be tapped to provide the signal which enables the deactivator 14. Some bar code readers have a port into which a remote speaker can be plugged so that the "beep" signal can be emitted at some remote point. The signal at this port can also be used for the purpose of enabling the deactivator 14. It will be understood from the above that the location at which the "successful swipe" signal is picked up is not important. It can be tapped-off at any suitable point in the bar code reader's circuitry, or picked-up acoustically. The method chosen depends on how it is most convenient to do it with the specific bar code reader that is being used.

The beep picked up by the pick-up 20 can be used, in conjunction with a microswitch 26 on a cash drawer 28, to detect fraudulent activities based on the cashier deliberately failing to shut the drawer 28 after a transaction. The unit 16 receives two signals. The one received from the microswitch 26 along the line 30 indicates if the drawer 28 has been closed or left open. The other signal is received along the line 18 and indicates that an article has been swiped over the bar code reader 10. This combination of a signal received along the line 30 indicating that the drawer 28 is open and a signal received along the line 18 indicating that an article has been swiped is used to establish an alarm condition. This is because failure to close the drawer 28 but to swipe articles, unless it happens infrequently and is genuinely by accident, has to be taken as an indication that possibly a fraudulent scheme is underway.

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Turning now to Figure 3, the unit 16 is illustrated as is the acoustic pick-up 20, the line 24 and the deactivator 14. Between the pick-up 20 and the unit 16 there is a two stage amplifier 32 with gain control and rectification. The output of the amplifier 32 is fed to the unit 16 as a control pulse.

5 A digital band pass control 34 is connected to the unit 16 and can be adjusted to tune the unit 16 to the frequency of the audio signal. A further control 36 is provided for adjusting the time for which a pulse remains on the line 24 after an input pulse is received at the unit 16 from the amplifier 32.

10 In the event that the sales area is noisy, and difficulties are encountered in picking-up the audio signal, a signal can be picked up at 38 from a suitable location in the circuitry of the bar code reader. This signal may, on a successful read, go from low to high or high to low. This signal replaces the signal from the audio pick-up and enables the tag deactivator 14.

15 The unit 16, which can be a programmable controller, can have a so-called jug plug socket 40 into which a programmed jug plug 42 can be inserted. This overrides the unit 16 and results in a pulse on line 24 which remains on line 24 until the jug plug 42 is removed.

 A port 44 of the unit 16 has the line 30, and hence the micro switch 26 on the drawer 28, connected to it.

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CLAIMS:

1. A checkout system to non-invasively interface a bar code reader to an anti-theft tag deactivator, comprising:

a bar code reader for reading indicia associated with
5 an article and generating a first signal indicating a
successful read of the indicia;

non-invasive interface means for sensing said first
signal disposed within a preselected distance of said bar code
reader, said sensing means generating a second signal upon
10 sensing said first signal, said means for sensing said first
signal and said means for generating said second signal are
electrically separate; and,

an anti-theft tag deactivator, said anti-theft tag
deactivator being activated for a predetermined period when
15 triggered by said second signal.

2. The system of claim 1 wherein said first signal is
audible and said sensing means is a microphone.

3. The system of claim 1 wherein said first signal is
optical and said sensing means is an optical sensor.

20 4. The system of claim 1 further including a controller,
said controller including means for selecting the activation
period of said anti-theft tag deactivator after receiving said
second signal, and including manual means to activate said
anti-theft tag deactivator without receiving said second
25 signal.

5. A method to non-invasively interface a point-of-sale
reader to an anti-theft tag deactivator, comprising:

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reading indicia associated with an article and
generating a first signal;

non-invasively sensing said first signal and
generating a second signal wherein said first signal is
5 electrically separate from said second signal; and

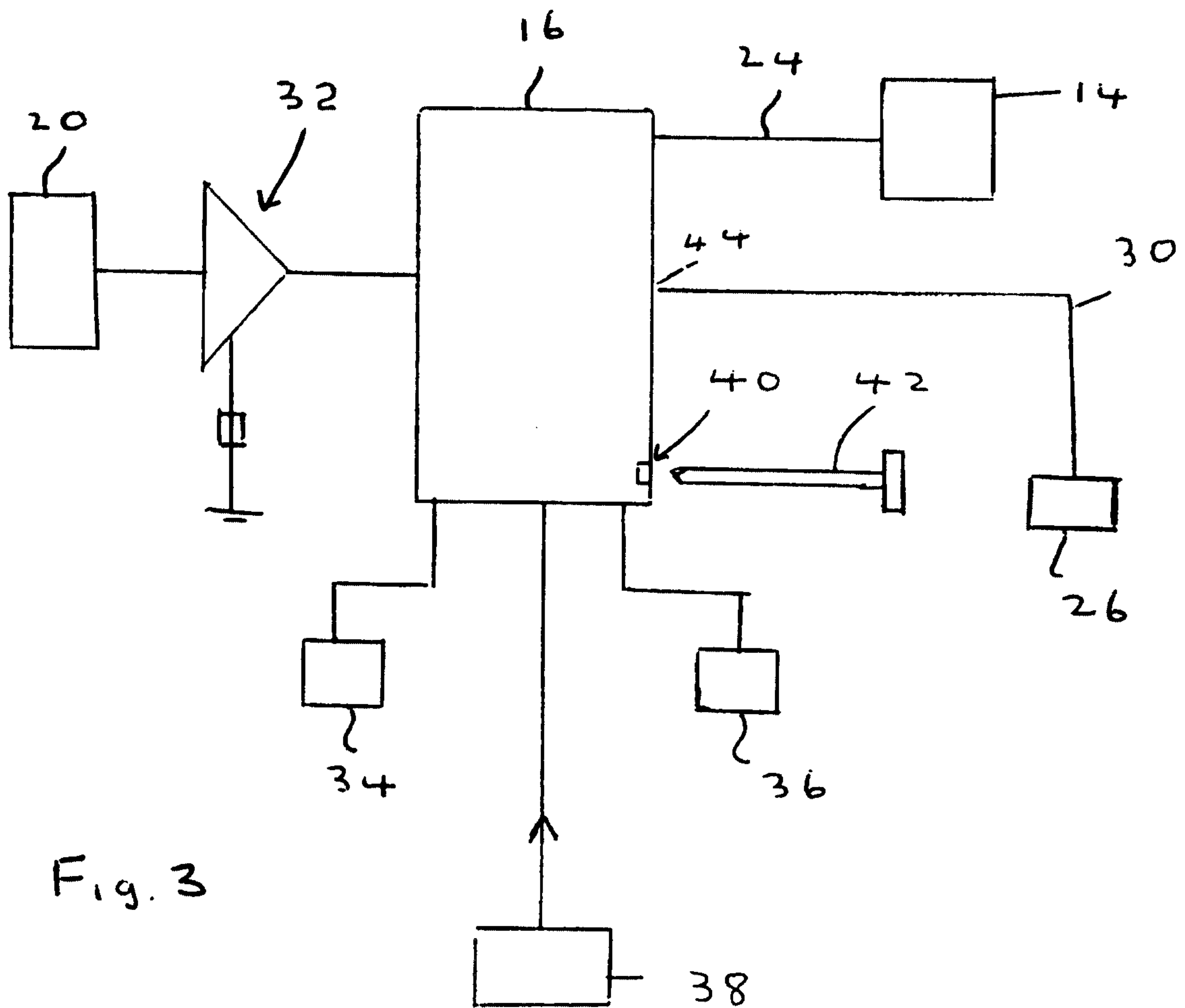
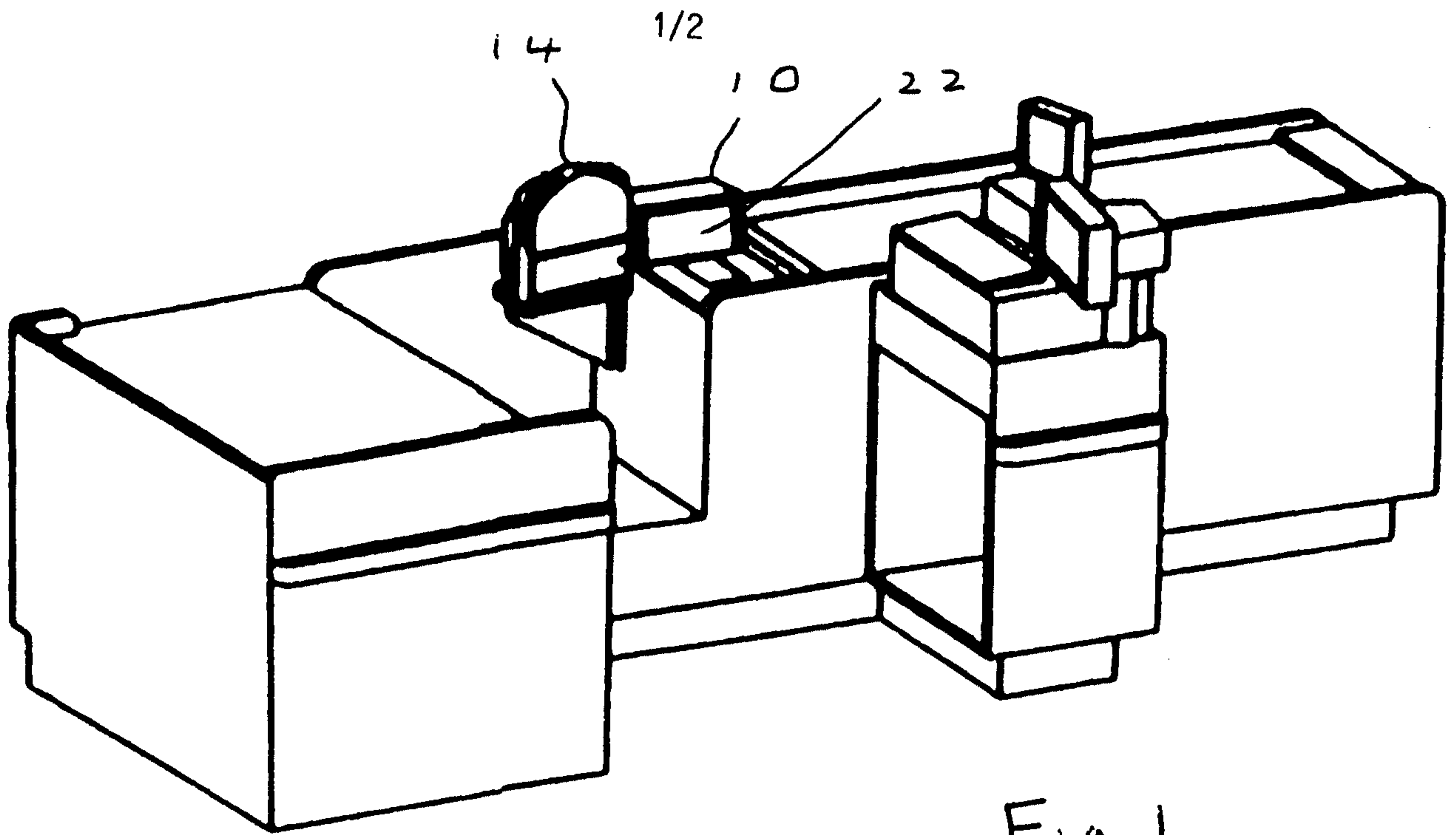
receiving said second signal and deactivating an
anti-theft tag.

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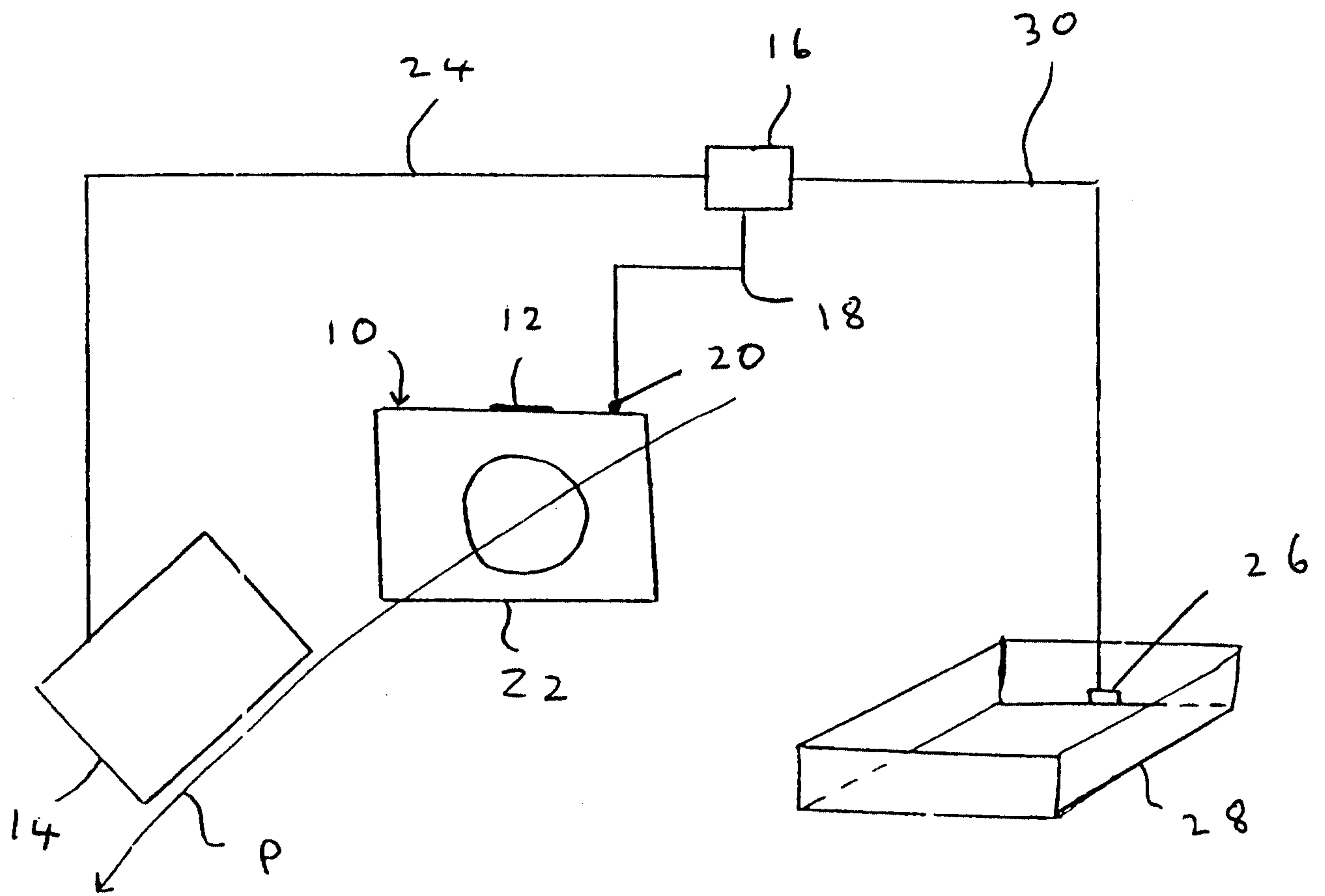


Fig. 2

