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Metering devices and magnetic cards for use with  
such devices.

This invention relates to metering devices, for example vehicle parking meters, and to magnetic cards for use with such devices.

In particular, this invention relates to such  
5 devices for use with an elongate card having magnetic data disposed along a lengthwise extending strip of the card, in which a first sensor and a shutter are located behind an opening in the front of the device and in which card processing means including further sensors, card  
10 drive means and a magnetic data processing head are located along a card transport path behind the shutter. In an operation of the device a card is manually inserted into the device through the opening, and, if the first sensor detects that it is an authorised card, the shutter opens  
15 and then when the card has been further manually inserted for a certain distance it is engaged and moved by the card drive means past the magnetic data processing head in cooperation with the further sensors. The first sensor, shutter, further sensors, card drive means and magnetic  
20 data processing head in such devices will be electrically operated. It is necessary for an operating circuit for the first sensor to continuously use current when a card is not in the device and it is necessary for further operating

circuits for the shutter, further sensors, card drive means and magnetic data processing head to use current in an enabled state of those further operating circuits prior to their actual operation.

5        If metering devices as described above are located near to a mains electricity supply then it will usually be convenient to operate them from that supply. However, there are applications for such metering devices, for example where the devices are vehicle parking meters, where it  
10 would be more convenient to have them battery operated.

A problem then arises as to the effect on battery life of the use of current by the above-described operating circuits if any of them are enabled for a significant length of time in addition to that which is strictly  
15 required. A particular instance where battery life could be drastically reduced would be if the device operates to allow manual insertion of a card past the shutter, if this operation enables the operating circuits for the further sensors, card driving means, and magnetic data processing  
20 head of the card processing means and if there is then a long delay in which the user fails to continue manual insertion of the card to the position where the card processing means will operate to move the card and process its magnetic data.

25        An object of the invention is to provide a battery operated metering device in which the reduction of battery life by the effects just described is substantially avoided.

According to the invention there is provided a metering device for use with an elongate card having magnetic data  
30 disposed along a lengthwise extending strip of the card, in which a magnetic sensing head, shutter means, and card processing means are located in that order along a card transport path behind an opening in the front of the device and are connected via respective operating circuits to a  
35 processing and control circuit, the card processing means comprising card sensor means, card drive means and a magnetic data processing head, in which the device is battery operable,

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in which the processing and control circuit and the operating circuit for the magnetic sensing head are continuously enabled and use a low current, in which the operating circuits for the shutter means and the card processing means are disabled when such a card is not in the device and use a high current only when they are enabled by the processing and control circuit, in which the device is for use with such a card having first and second magnetic strips which are aligned along the length of the card and displaced across the width of the card with respect to said magnetic data bearing strip, the first magnetic strip being at one end of the card and separated from the second magnetic strip by a non-magnetic region, a number of magnetic flux transitions included in the first magnetic strip being spaced by a predetermined distance along the length of the card from a number of magnetic flux transitions included in the second magnetic strip, in which the device is arranged such that immediately following manual insertion of said one end of such a card through said opening orientated so that the first and second magnetic strips are aligned with the magnetic sensing head, the processing and control circuit responds to detection by the magnetic sensing head of said transitions in the first magnetic strip so as to temporarily enable the operating circuits for the shutter means and the card processing means and to temporarily operate the shutter means to allow continued manual insertion of the card with said one end passing the shutter means, and in which the device is arranged such that when the card is further manually inserted into the device to a position where the processing and control circuit responds to detection by the magnetic sensing head of said transitions in the second magnetic strip so as to again enable the operating circuits for the shutter means and the card processing means, the processing and control circuit will then respond to detection by the card sensor means that the card has reached that position and will initiate an operation in which the card

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is moved along the transport path by the card drive means in cooperation with the card sensor means and the data on the magnetic data bearing strip is read and then modified by the magnetic data processing head.

5 According to the invention there is also provided an elongate card for use with a metering device as described in the previous paragraph, the card having magnetic data disposed along a lengthwise extending strip of the card and having first and second magnetic strips which are  
10 aligned along the length of the card and displaced across the width of the card with respect to said magnetic data bearing strip, the first magnetic strip being at one end of the card and separated from the second magnetic strip by a non-magnetic region, a number of magnetic flux trans-  
15 itions included in the first magnetic strip being spaced by a predetermined distance along the length of the card from a number of magnetic flux transitions included in the second magnetic strip.

The basic idea of this invention is to protect the  
20 life of a battery which may power the metering device by providing for the processing and control circuit to operate the device in two different current consuming modes, a low power mode and a high power mode, the circuit being able to switch between these two modes by cooperating with a  
25 card which has separated magnetic strips in addition to and to one side of the magnetic data bearing strip. In the low power mode the device is ready to detect two stages in the manual insertion of an authorised card, and the magnetic sensing head located in front of the shutter for  
30 this detection has a low current using operating circuit which is continuously enabled when the device is not in use. This operating circuit for the magnetic sensing head can use a current which is at least twenty times less than the current which would be required to continuously enable an  
35 optical sensor in front of the shutter. At the first detection stage when the first magnetic strip passes the magnetic sensing head the processing and control circuit temporarily switches to the high power mode in order to

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operate the shutter means. As soon as the card has been manually inserted past the shutter, the processing and control circuit reverts to the low power mode so that any length of delay, or even failure, of further manual insertion of the card will not adversely affect the battery life. If and when the second stage of manual insertion causes the second magnetic strip to pass the magnetic sensing head the processing and control circuit again switches to the high power mode. The card sensor means which is enabled at this stage will then detect that the card has reached the position where the high power mode is continuously required for the duration of an operation in which the device moves the card and processes the magnetic data on it. It is not necessary to conduct any timing process or high power mode operation of the card sensor means to monitor the progress of manual insertion of the card between the first and second detection stages.

A metering device according to the invention may be for use with such a card having said magnetic data bearing strip centrally disposed with respect to the width of the card, having third and fourth magnetic strips which are aligned along the length of the card and displaced across the width of the card with respect to the centrally disposed strip by the same amount as the first and second magnetic strips and to the other side of the centrally disposed strip, the third magnetic strip being at the other end of the card and separated from the fourth magnetic strip by a non-magnetic region, a number of magnetic flux transitions included in the third magnetic strip being spaced by said predetermined distance along the length of the card from a number of magnetic flux transitions included in the fourth magnetic strip, the magnetic data and the first, second, third and fourth magnetic strips being in the region of the same one of the two major faces of the card, the device in this case being arranged such that following manual insertion of said other end of such a card through said opening orientated so that the third and fourth magnetic strips are aligned with the magnetic sensing head, the device

will respond to the third and fourth magnetic strips in the same manner as to the first and second magnetic strips except that in the operation in which the card is moved along the transport path by the card drive means in cooperation with the card sensor means the data on the magnetic data bearing strip is read but is not modified by the magnetic data processing head.

Such a bidirectional use of a magnetic card having centrally disposed data for either modifying the data on the card or for reading the data without modifying it has been previously proposed for use with vehicle parking meters and it is a further advantage that this facility can be incorporated in devices and cards according to this invention.

In a metering device according to the invention the shutter means may include a shutter member pivotable about an axis which is parallel to the plane of the transport path, the shutter member having a closure portion which is normally spring biased to extend into the transport path and which has a ramped rear surface, such that upon a said card being driven against the closure portion from within the device the rear of the card rides on said ramped rear surface so as to move the closure portion out of the transport path without the need to operate the shutter means via its operating circuit. In this arrangement, ejection of a card from the device is achieved solely by the mechanical action of the rear of a card moving over the ramped rear surface of the shutter and pivoting the shutter against the spring bias. It is an advantage that a further magnetic sensing head is not required for electrical operation of the shutter

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to enable ejection of a card. The absence of such a further magnetic sensing head also has a space saving effect in that if it is required to move a card backwards towards the shutter and then forwards within the device as part of the processing of the card prior to ejection, such backwards movement of the card may be taken all the way to the rear of the shutter. This space saving is advantageous where a transport path of compact length is required, for example in a vehicle parking meter having small overall dimensions.

In a metering device according to the invention, a brush may be located behind said opening and opposite the magnetic sensing head such that it both excludes extraneous matter from entering the device when not in use and presses said card against the magnetic sensing head during manual insertion of said card. This additional use of a brush as a pressure member helps to ensure reliable detection by the magnetic sensing head of the magnetic flux transitions in the first and second magnetic strips on the card, or those in the third and fourth magnetic strips if present on the card, when aligned with the magnetic sensing head.

Embodiments of the invention will now be described with reference to the accompanying drawings, in which

Figure 1 shows a plan view of a magnetic data bearing card according to the invention,

Figure 2 shows a metering device for use with the magnetic card of Figure 1, the mechanical arrangement of the device being shown in schematic side view and the associated electrical circuits being shown diagrammatically in schematic blocks,

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Figure 3 is a detailed side view of the shutter arrangement, consisting essentially of a shutter member and a solenoid mounted to each other and to a card transport path, in the direction of the arrow I on Figure 5,

5 Figure 4 is a front view of the shutter arrangement in the direction of the arrow II on Figure 3,

Figure 5 is an underneath view of the shutter arrangement in the direction of the arrow III on Figure 3,

10 Figure 6 is a section view of the shutter arrangement along the line IV-IV of Figure 5, on an enlarged scale with respect to Figures 3 to 5, and

Figure 7 is a schematic perspective view of the shutter member of the shutter arrangement and its position with respect to the transport path and a card, with the  
15 solenoid of the arrangement omitted for the sake of clarity.

Referring now to Figure 1 of the drawings, an elongate magnetic data bearing card C has three magnetic strips M1, M2 and M3 aligned along the length of the card and centrally  
20 disposed with respect to the width of the card. The magnetic strip M1 is adjacent one end R of the card C, a non-magnetic region N1 extends along the length of the card between the magnetic strips M1 and M2, another non-magnetic region N2 extends along the length of the card  
25 from the magnetic strip M2 towards the other end F of the card and the magnetic strip M3 is adjacent that end F of the card. The magnetic strips M1 and M3 each have data which is not to be modified by the metering device and comprise timing information in that data. The magnetic  
30 strip M2 has data which is to be modified by the metering device and that data comprises information determining a token value of the card C.

The card C also has two magnetic strips M4 and M5 aligned along the length of the card and displaced across  
35 the width of the card with respect to the data bearing strips M1 to M3 at one longitudinal edge of the card. The

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magnetic strip M4 is at the end F of the card and separated from the magnetic strip M5 by a non-magnetic region N3. A number of magnetic flux transitions included in the magnetic strip M4 is spaced by a predetermined distance along the length of the card from a number of magnetic flux transitions included in the magnetic strip M5. Two magnetic strips M6 and M7 are aligned along the length of the card C and displaced across the width of the card with respect to the data bearing strips M1 to M3 to the other side of those strips at the other longitudinal edge of the card. The magnetic strip M6 is at the end R of the card and separated from the magnetic strip M7 by a non-magnetic region N4. Magnetic flux transitions are included in the magnetic strips M6 and M7 and spaced along the length of the card in the same manner as for the magnetic strips M4 and M5. The magnetic strips M4 and M6 are for the purpose of allowing entry into a metering device past a shutter only of an authorised card having such strips as will be described in detail later.

The magnetic strips M1 to M7 are all in the region of the same one of the two major faces of the card C, and a suitable method of providing these strips is to simultaneously print them by a silk screening process.

Referring now to Figure 2, a metering device for use with the card C has a drive wheel W for moving the card C along a transport path P by frictional contact with the card C. The length of the path P between an opening O at the front face FA of the device and an end stop E is equal to twice the length of the card C and the drive wheel W is positioned half way along the length of the path P. A magnetic data processing head H is positioned adjacent the path P opposite the drive wheel W, and two photo-electric sensors S1 and S2 are also positioned adjacent the path P, the sensor S1 being half way along the length of the path P and the sensor S2 being behind the sensor S1 towards the end stop E. The drive wheel W, magnetic head H and sensors S1 and S2 together constitute card processing

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means. A shutter SH and an associated magnetic sensing head HS in front of the shutter SH are also located along the transport path P behind the opening O. A brush B is also located behind the opening O and is opposite the magnetic sensing head HS such that the brush B both excludes extraneous matter from entering the device when not in use and presses the card C against the head HS during manual insertion of the card.

The opening O has a portion RC recessed with respect to the front face FA such that when a card C is in the device with its rear end edge R level with the front face FA a rear portion of the card C can be manually held. The shutter SH has a closure portion which is near to and behind the rearward limit of the recessed portion RC of the opening O. This closure portion is normally spring biased to extend into the transport path P and has a ramped rear surface.

The magnetic sensing head HS, shutter SH, and card processing means (W,H,S1 and S2) are connected via respective operating circuits 10 to 15 to a processing and control circuit 16. The circuit 10 is an amplifier suitable for the magnetic sensing head HS. The circuit 11 is a suitable drive amplifier for a solenoid (not shown in Figure 2) which actuates the shutter SH. The circuit 12 controls a motor (not shown) which drives the drive wheel W. The circuits 13 and 14 are respectively a reading circuit and a writing circuit for the magnetic data processing head H. The circuit 15 is a sensing circuit connected to the sensors S1 and S2. The processing and control circuit 16 includes a suitably programmed microprocessor.

The metering device is operable by a battery 17. The processing and control circuit 16 and the amplifier 10 are continuously enabled and use a low current from the battery 17. The operating circuits 11 to 15 are disabled when a card C is not in the device and use a high current from the battery 17 only when they are enabled by the processing and control circuit 16 via power-up circuitry 18. In an example where the device is a vehicle parking meter the battery 17 may have a capacity of 6 ampere-hours, the

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processing and control circuit 16 and the amplifier 10 continuously use less than 1mA in the low power mode, and when the operating circuits 11 to 15 are enabled in the high power mode they use a quiescent current of approximately 200mA.

The operation of the device for decrementing the token value of the card C is as follows. The card C is manually inserted into the path P through the opening O orientated so that the end F precedes the end R and the magnetic strips M4 and M5 are aligned with the magnetic sensing head HS. Immediately following this manual insertion, the processing and control circuit 16 responds to detection by the magnetic sensing head HS of a predetermined number of magnetic flux transitions, for example four, in the magnetic strip M4 so as to temporarily switch to its high power mode in which the operating circuits 11 to 15 are enabled via the power-up circuitry 18 and to temporarily operate the shutter SH via its operating circuit 11, for example for a period of approximately 150ms, to allow continued manual insertion of the card C with the end F passing the shutter SH. The processing and control circuit 16 then reverts to its low power mode until the card C is further manually inserted into the device to a position where the end F of the card reaches and covers the sensor S1. At this position the first of the magnetic flux transitions in the magnetic strip M5 is at the magnetic sensing head HS. The composition and arrangement of the drive wheel W is such that although it engages the card C at this position it allows continued manual insertion of the card C into the device for a small distance so that a predetermined number of magnetic flux transitions, again for example four, in the magnetic strip M5 are detected by the magnetic sensing head HS. The processing and control circuit 16 responds to this detection to switch again to its high power mode in which the operating circuits 11 to 15 are enabled via the power-up circuitry 18. The processing and control circuit 16 will then respond to detection via the sensing circuit 15 that the sensor S1 is covered so that the drive wheel W

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is rotated to drive the card C forward in a direction into the device all the way to the end stop E while all the magnetic data on the card C is successively read from the magnetic strips M3, M2 and M1 via the reading circuit 13. The rate at which all this data is read is determined by the timing information on the magnetic strip M3. When the end F of the card C reaches the end stop E the sensor S1 is uncovered (with the sensor S2 covered) and the processing and control circuit 16 responds to this information from the sensing circuit 15 to reverse the direction of rotation of the drive wheel W via the motor control circuit 12 so as to move the card C in a direction out of the device. In this backward movement of the card C the data on the magnetic strip M1 is first read via the reading circuit 13. The processing and control circuit 16 responds to the information from the sensing circuit 15 indicating the start of this backward movement together with the timing information read from the magnetic strip M1 to switch on the writing circuit 14 while the mid point G1 of the non-magnetic region N1 of the card C is passing the magnetic head H, then to decrement the token value of the card C by writing modified data on the magnetic strip M2 at a rate determined by the timing information received from the magnetic strip M1. The end F of the card C reaches and uncovers the sensor S2 (with the sensor S1 covered) when the mid point G2 of the non-magnetic region N2 reaches the magnetic head H. In this position of the card C, its end R has not reached the shutter SH and the card is not manually accessible. The processing and control circuit 16 responds to the information from the sensing circuit 15 at this point to switch off the writing circuit 14 and to reverse the direction of rotation of the drive wheel W to move the card C forwards again towards the end stop E. During this second forward drive of the card the rewritten data on the magnetic strip M2 is read via the reading circuit 13 into the processing and control circuit 16 for the purpose of

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verification. When the card C reaches the end stop E for the second time the sensor S1 is again uncovered (with the sensor S2 covered) and the processing and control circuit 16 responds to this information being received for a second time from the sensing circuit 15 to reverse the direction of rotation of the drive wheel W so as to move the card C in a direction out of the device without operation of the magnetic head H for either reading or writing until both the sensors S2 and S1 are uncovered by the passage of the end F of the card at which time the drive wheel W is stopped and the processing and control circuit 16 switches back to its low power mode. During this just-described fully backward movement of the card the end R of the card C rides on the ramped rear surface of the closure portion of the shutter SH so as to move that closure portion out of the transport path solely by mechanical action without the need for detection by a sensor. The card C has then been ejected from the device, that is to say the end R of the card is in line with the opening O and a portion of card C is manually accessible for removal via the recess RC in the opening O.

The operation of the device for reading the data on the card C without decrementing its token value, normally in order to display the token value to the user, is as follows. The card C is manually inserted into the path P through the opening O orientated so that the end R precedes the end F and the magnetic strips M6 and M7 are aligned with the magnetic sensing head HS. The response of the device to the magnetic strips M6 and M7 to allow insertion of a card authorised by the presence of these strips is the same as that described above in relation to the magnetic strips M4 and M5. The processing and control circuit 16 is then responsive to a difference in the data on the magnetic strips M1 and M3 to control a sequence in which the card is moved once fully forwards to the end stop E while reading all the magnetic data on the card C and then moved

once fully backwards to eject the card C from the device.

For both the operations of the device described above the card C is manually inserted into the device with the major face on which the magnetic strips M1 to M7 are present facing the magnetic heads HS and H. If the card C is inserted with its other major face nearest to the magnetic heads, the thickness of the card should distance the magnetic flux transitions in either the magnetic strip M5, or the magnetic strip M7 as the case may be, which is then at the leading end of the card sufficiently far away from the magnetic sensing head HS to prevent it detecting those transitions and hence to prevent the shutter SH being opened. Figure 1 shows non-magnetic gaps between the magnetic strips M5 and M7 and the respective ends R and F of the card C. These gaps serve as an added precaution so that if the card is inserted the wrong way round as just described and transitions are detected from the magnetic strip M5, or the magnetic strip M7 as the case may be, the card will have advanced to the shutter SH and jammed against it before the shutter SH can respond to these transitions to move the closure member out of the transport path P.

The shutter arrangement of the metering device shown in Figure 2 will now be described in more detail.

Referring now to Figures 3 to 7, upper and lower plates 110, 111 provide the front opening O and the transport path P extending behind the front opening for a card C (Figures 6 and 7).

A one piece plastics moulding has a T-shaped central portion with the crosspiece portion 21 of the T extending parallel to the plane of the transport path P and the upright portion 22 of the T extending perpendicular to and away from the plane of the transport path P. A frontwards extending part 23 of the T crosspiece 21 has two screw holes 24 via which it is held to a rib 115 (Figure 3) on the underneath of the plate 111. The

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upright portion 22 of the T crosspiece 21 holds a solenoid 30 with the path of the solenoid plunger 31 (Figure 6) extending parallel to and along the length of the transport path P. One end of the body of the solenoid

5 30 near the plunger 31 extends through a hole 25 in the upright portion 22 and is held to it by a nut 32 and a mounting plate 33 (Figure 6). Two triangular webs 26 (not shown in Figure 7) extend between the frontwards extending part 23 and the upright portion 22 of the T crosspiece 21, one on either side of the solenoid 30.

A shutter member includes a frame portion 40 of the one piece plastics moulding surrounding the T shaped portion substantially in the plane of the crosspiece 21. A hinge connection is formed integrally between the rear 15 of the frame portion 40 and a backward extending part 27 of the T crosspiece 21 by two thinned and grooved hinge pieces 28, one at each side of the T crosspiece 21. The two hinge pieces 28 provide an axis A-A parallel to the plane of the transport path P about which axis the 20 shutter member is pivotable. A closure portion 41 of the shutter member extends from the whole width of a front portion of the frame 40 towards the transport path P and the shutter member is normally spring biased so that an upper portion of the closure portion 41 extends into 25 the transport path P through a slot 116 in the plate 111, this upper portion having a ramped rear surface 42.

An actuating portion 43 of the shutter member extends from the middle of the rear portion of the frame 40 away from the transport path P and is in the path of the solenoid 30 plunger 31. In the normal position of the shutter member, the spring bias is provided by a spring 50 held between the lower ends of the actuating portion 43 and the mounting plate 33, and the head of the solenoid plunger 31 just rests against the middle of the actuating portion 43. Two 35 triangular webs 44 (not shown in Figure 7) extend between the rear of frame portion 40 and the actuating portion 43.

The magnetic sensing head HS is located in front of the shutter slot 116 to respond to the passage of an

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authorised card C towards the shutter portion 41 and cause a pulsed energisation of the solenoid 30. Thus in the case where the front of an authorised card C is manually inserted through the front opening O the solenoid 30 is energised to move the plunger 31 against the actuating portion 43 and so pivot the shutter member about the axis A-A against the bias of the spring 50 to move the closure portion 41 out of the transport path P and enable movement of the card C over the closure portion 31 into the metering device. If the front of an unauthorised card is inserted through the front opening O towards the shutter, the sensing head HS will not respond to the passage of the card and the solenoid 30 will not be energised. The card will then bear and jam against the front of the shutter closure portion 41 and tends to pivot it further into the transport path P and against the plate 110. When a card C is driven against the closure portion 41 from within the device the rear of the card C rides on the ramped rear surface 42 so as to pivot the shutter member against the bias of the spring 50, move the closure portion 41 out of the transport path P and enable movement of the rear of the card C over the closure portion 41 for ejection from the device without the need for energisation of the solenoid 30. Thus ejection of a card from the device past the shutter is achieved solely by the mechanical action of the card moving against the shutter.

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CLAIMS

1. A metering device for use with an elongate card having magnetic data disposed along a lengthwise extending strip of the card, in which a magnetic sensing head, shutter means, and card processing means are located in that order along a card transport path behind an opening in the front of the device and are connected via respective operating circuits to a processing and control circuit, the card processing means comprising card sensor means, card drive means and a magnetic data processing head, in which the device is battery operable, in which the processing and control circuit and the operating circuit for the magnetic sensing head are continuously enabled and use a low current, in which the operating circuits for the shutter means and the card processing means are disabled when such a card is not in the device and use a high current only when they are enabled by the processing and control circuit, in which the device is for use with such a card having first and second magnetic strips which are aligned along the length of the card and displaced across the width of the card with respect to said magnetic data bearing strip, the first magnetic strip being at one end of the card and separated from the second magnetic strip by a non-magnetic region, a number of magnetic flux transitions included in the first magnetic strip being spaced by a predetermined distance along the length of the card from a number of magnetic flux transitions included in the second magnetic strip, in which the device is arranged such that immediately following manual insertion of said one end of such a card through said opening orientated so that the first and second magnetic strips are aligned with the magnetic sensing head, the processing and control circuit responds to detection by the magnetic sensing head of said transitions in the first magnetic strip so as to temporarily enable the operating circuits for the shutter means and the card processing means and

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to temporarily operate the shutter means to allow continued manual insertion of the card with said one end passing the shutter means, and in which the device is arranged such that when the card is further manually inserted into the device to a position where the processing and control circuit responds to detection by the magnetic sensing head of said transitions in the second magnetic strip so as to again enable the operating circuits for the shutter means and the card processing means, the processing and control circuit will then respond to detection by the card sensor means that the card has reached that position and will initiate an operation in which the card is moved along the transport path by the card drive means in cooperation with the card sensor means and the data on the magnetic data bearing strip is read and then modified by the magnetic data processing head.

2. An elongate card for use with a metering device as claimed in claim 1, the card having magnetic data disposed along a lengthwise extending strip of the card and having first and second magnetic strips which are aligned along the length of the card and displaced across the width of the card with respect to said magnetic data bearing strip, the first magnetic strip being at one end of the card and separated from the second magnetic strip by a non-magnetic region, a number of magnetic flux transitions included in the first magnetic strip being spaced by a predetermined distance along the length of the card from a number of magnetic flux transitions included in the second magnetic strip.

3. A metering device as claimed in claim 1, in which the device is for use with such a card having said magnetic data bearing strip centrally disposed with respect to the width of the card, having third and fourth magnetic strips which are aligned along the length of the card and displaced across the width of the card with respect to the



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centrally disposed strip by the same amount as the first and second magnetic strips and to the other side of the centrally disposed strip, the third magnetic strip being at the other end of the card and separated from the fourth magnetic strip by a non-magnetic region, a number of magnetic flux transitions included in the third magnetic strip being spaced by said predetermined distance along the length of the card from a number of magnetic flux transitions included in the fourth magnetic strip, the magnetic data and the first, second, third and fourth magnetic strips being in the region of the same one of the two major faces of the card, the device in this case being arranged such that following manual insertion of said other end of such a card through said opening orientated so that the third and fourth magnetic strips are aligned with the magnetic sensing head, the device will respond to the third and fourth magnetic strips in the same manner as to the first and second magnetic strips except that in the operation in which the card is moved along the transport path by the card drive means in cooperation with the card sensor means the data on the magnetic data bearing strip is read but is not modified by the magnetic data processing head.

4. An elongate card for use with a metering device as claimed in claim 3, the card having said magnetic data bearing strip centrally disposed with respect to the width of the card, having third and fourth magnetic strips which are aligned along the length of the card and displaced across the width of the card with respect to the centrally disposed strip by the same amount as the first and second magnetic strips and to the other side of the centrally disposed strip, the third magnetic strip being at the other end of the card and separated from the fourth magnetic strip by a non-magnetic region, a number of magnetic flux transitions included in the third magnetic strip being spaced by said predetermined distance along the length of the card from a number of magnetic flux transitions included in the



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fourth magnetic strip, the magnetic data and the first, second, third and fourth magnetic strips being in the region of the same one of the two major faces of the card.

5. A metering device as claimed in claim 1 or claim 3,  
5 in which the shutter means includes a shutter member pivotable about an axis which is parallel to the plane of the transport path, the shutter member having a closure portion which is normally spring biased to extend into the transport path and which has a ramped rear surface, such  
10 that upon a said card being driven against the closure portion from within the device the rear of the card rides on said ramped rear surface so as to move the closure portion out of the transport path without the need to operate the shutter means via its operating circuit.
- 15 6. A metering device as claimed in any one of claims 1, 3 or 5, in which a brush is located behind said opening and opposite the magnetic sensing head such that it both excludes extraneous matter from entering the device when not in use and presses said card against the magnetic  
20 sensing head during manual insertion of said card.
7. A metering device substantially as described herein with reference to the accompanying drawings.
8. A magnetic card substantially as described herein with reference to the accompanying drawings.