scrollwheel, wherein the user experiences the feeling of the scrollwheel being moved laterally down, indicating to the user that they are able to enter data. While the cursor passes through the radio buttons **540**, the user may be sent a series of "bumps" or detents as each of the possible options are highlighted. Scrolling through the regular text **550**, the user may experience no feedback, or perhaps slight rolling resistance. When the cursor **580** encounters the bold text **560**, however, the scrollwheel rolling resistance would increase, indicating an area of particular interest to the user. Finally, upon reaching the email address **570** at the end of the page, the scrollwheel may be sent a "bump" indicating a link to an email address. The scrollwheel may then placed in "full-stop" mode, where the rolling resistance is increased to a maximum value, indicating to the user that the end of the data page has been reached. It will be appreciated by someone skilled in the art that the various types of feedback associated with the assorted objects on the data page can be selected based on a number of criteria. They may be selected based on user preferences, based on feedback data embedded in the data page, based on a software application analyzing the page and determining where a particular type of feedback is appropriate, or based on some other criteria.

[**0029**] **FIG. 6** is a block diagram showing a method for providing dynamic feedback to a handheld electronic device user. In step **600**, a software module on the handheld electronic device is in a standby state waiting for user input. In step **610**, the user initiates an input signal to the handheld electronic device using the scrollwheel. This user-initiated input may include a roll of the scrollwheel, a click of the scrollwheel, or some combination of roll and click, and generally corresponds to a cursor action on the display screen. In step **620**, the software module analyses data associated with the input the user just performed (often with respect to a new cursor position). In step **630**, the software module determines if a dynamic feedback response is required. If a dynamic feedback response is not required, the software module simply returns to a wait state. If a dynamic feedback response is required, the appropriate type of feedback is activated in step **640**, after which the software module returns to its wait state.

[**0030**] **FIG. 7** shows one embodiment of the invention for providing frictional resistance. In this embodiment, a scrollwheel **700** is connected to and rotates about a body assembly **710**, and the scrollwheel **700** comprises a first mechanical clutch plate **720** which rotates with the scrollwheel **700**. The body assembly **710** comprises a second mechanical clutch plate **721** that is rotationally fixed with respect to the body assembly but capable of engaging the first clutch plate **720**. The mechanical clutch plates **720** and **721** are aligned so they are substantially coplanar, and are separated by a small gap **722**. When a force **740** is applied normal to the surfaces of the clutch plates **720** and **721** of sufficient magnitude to cause the first clutch plate **720** to engage the second clutch plate **721**, the resulting friction force will oppose rotation of the scrollwheel **700**. It will be appreciated by one skilled in the art that the resulting frictional force is approximately proportional to the normal force **740** multiplied by the frictional coefficient "μ", and that varying the normal force **740** will cause the frictional force opposing the rotation of the scrollwheel **700** to vary accordingly. To generate the required normal force **740**, various means may be used, including an electromagnetic solenoid **730** connected to an electronic brake controller **750** or some other electrical or mechanical means as will be evident to one skilled in the art.

[**0031**] **FIG. 8** is a diagram showing the use of an electromagnetic motor for providing rolling resistance in a scrollwheel. A scrollwheel **800**, which is connected to and rotates about a body assembly **810**, also comprises an electromagnetic motor **820**, which is controlled by a motor controller **830**. By adjusting the properties of the electromagnetic motor **820**, the motor controller **830** can increase or reduce the required scrollwheel **800** rolling resistance.

[**0032**] **FIG. 9** is a diagram showing the use of a cam mechanism for providing lateral motion in scrollwheel. Lateral scrollwheel motion is generally defined as motion along a plane normal to the axis of the scrollwheel. Pushing the edge of the scrollwheel causing it to move in towards the body of a handheld electronic device, without causing rotation to the scrollwheel, for example, is one type of lateral movement. In **FIG. 9**, a scrollwheel **900** is connected to and rotates **901** about a body assembly **910**. In this embodiment, the body assembly **910** is connected to or may even be a part of a slide assembly **920**. The slide assembly **920** allows the entirety of the scrollwheel **900** and body assembly **910** to move freely laterally **902** with respect to the handheld electronic device. To control this lateral movement **902**, the slide assembly **920** is connected to a control mechanism such as cam mechanism **930** with a cam **931**, or alternatively a lever mechanism (not shown), a solenoid mechanism (not shown) or some other actuating means. The cam mechanism **930** is connected to a cam controller **940** responsible for controlling the lateral position of the scrollwheel. As the cam **931** connected to the cam mechanism **930** and the slide assembly **920** moves, the scrollwheel **900** and body assembly **910** move laterally **902** correspondingly.

[**0033**] It should be mentioned that although the present invention has been described in considerable detail with reference to certain preferred embodiments, other embodiments are possible. Therefore, the spirit and scope of the appended claims should not be limited to the description of the preferred embodiment contained herein.

What is claimed is:

1. A handheld electronic device comprising:

a scrollwheel for providing input to the handheld electronic device;

a dynamic feedback module connected to the scrollwheel for providing a plurality of types of feedback to a user of the handheld electronic device, each type of feedback associated with at least one of a plurality of feedback modes; and

a software module for selecting a feedback mode from the plurality of feedback modes and activating the associated type of feedback provided by the dynamic feedback module.

2. The handheld electronic device of claim 1 wherein the software module selects the feedback mode based on feedback data associated with a data page on the handheld electronic device.

3. The handheld electronic device of claim 1 wherein the software module selects the feedback mode based on a set of predetermined criteria.