Related U.S. Application Data

(60) Provisional application No. 61/073,630, filed on Jun. 18, 2008.

This disclosure relates to a dispenser which in one form is a motorized electric dispenser, designed to be a low-cost device having a reduced footprint. The dispenser electromechanically dispenses a pre-determined length sheet of material to the user, without the requirement of a touchless sensor, or the user needing to directly touch any part of the dispenser while the hygienic portion is functioning properly. In the event that the hygienic portion is not functioning properly, a manual advance assembly may also be utilized. One objective of the device in one form is to provide a variably determined sheet of material to the user in accordance with industry standards, without the use of the standard “touchless” sensors. In another form, the entire roll of material remains sanitary and enclosed within the dispenser until it is dispensed. In one form, there is no “tail” projecting from the dispenser that may be a source of cross-contamination.
ELECTRONIC ROLL TOWEL DISPENSER

RELATED APPLICATIONS


BACKGROUND OF THE DISCLOSURE

a) Field of the Disclosure

[0002] This invention relates generally to towel dispensers and particularly to a hygienic, away-from-home type paper towel dispenser.

SUMMARY OF THE DISCLOSURE

[0003] A hygienic dispenser for dispensing a length of product from a roll is disclosed herein. The dispenser comprises a dispenser housing; a surface defining an engagement opening in the dispenser housing; a dispensing slot; and a button mechanism adjacent the engagement opening. In one form, the product path is defined as the path product will take from the product roll to the dispensing slot. In one form, the product path passes between the engagement opening and the button mechanism.

[0004] The hygienic dispenser may also include a pressure roller adjacent to the drive roller. In one form, the roller is operatively configured to provide frictional engagement between the product being dispensed and the drive roller.

[0005] The hygienic dispenser may also comprise: a front casing; a rear casing, wherein the front casing is rotatably coupled to the rear casing; and a pressure roller which is coupled to the front casing.

[0006] In one form, the hygienic dispenser further comprises a manual advance assembly for use when the hygienic dispensing system is not functioning properly. The hygienic dispenser may also comprise an one-way-rotational device operatively configured to allow a user to manually operate the manual advance mechanism in only one direction. In this way, a user will not be able to “draw up” the product in the paper path as it will not be engaged with the drive roller.

[0007] The hygienic dispenser may be operatively configured to dispense a length of product at each operation of the button mechanism, greater than the distance along the paper path from the engagement opening to the dispensing slot. The hygienic dispenser may also comprise a cutting edge coupled to the dispenser housing, wherein the length of product dispensed at each operation of the button mechanism is greater than the distance along the paper path between the engagement opening and the cutting edge. In one form, the length of product dispensed at each operation of the button mechanism is greater than the distance along the paper path between the upper edge of the engagement opening and the cutting edge. In this way, the portion of product that was contacted by the user is dispensed to the user and a clean/hygienic touch surface is preserved.

[0008] The hygienic dispenser may also comprise a drive motor coupled to a drive roller wherein the drive roller is operatively configured to engage the product being dispensed. In one form, circuitry may be coupled between the drive motor and the button mechanism wherein the button mechanism is operatively configured to activate the drive motor when the button mechanism is engaged.

[0009] The hygienic dispenser may also comprise a product roll support within the dispenser housing. Such roll supports may be extensions, axles, planar supports, or equivalents.

[0010] The hygienic dispenser for dispensing a length of product from a roll may also be described as comprising: a dispenser housing; a surface defining an engagement opening in the dispenser housing; a dispensing slot; and a button mechanism adjacent the engagement opening. Wherein a portion of the product is positioned between the engagement opening and the button mechanism prior to exiting the dispenser to provide a renewable, hygienic surface for the engagement button or activator. In one form, the dispensing slot is positioned adjacent the bottommost surface of the dispenser. In one form, the surface defining an engagement opening is positioned at the front surface of the dispenser to make the contact portion more visible and convenient for a user.

[0011] A towel dispenser configured to dispense a towel therefrom is disclosed herein. The towel dispenser may also be described as comprising a casing comprising an interior chamber portion, wherein the interior chamber portion is configured to house a towel roll. In one form, the casing comprises a rearward portion and a forward portion, the forward portion comprising a perimeter surface defining an engagement opening. In one form, the casing comprises a towel dispensing portion (slot) configured to dispense a portion of the towel therefrom. Additionally, an activator member (button) may be included wherein the activator member is positioned in proximity to the engagement opening of the casing such that a portion of the towel is interposed between the activator and the engagement opening of the casing to be visible therethrough. In this embodiment, the engagement opening comprises a distance from a towel dispensing slot which is less than the length of the towel that is dispursed when the activator is activated ejecting a portion of the towel therefrom. In one form, the towel dispenser is configured such that when a user depresses a portion of the towel through the opening to activate the activator member, the portion of the towel depressed by the user is dispensed through the towel dispensing portion. The towel in one form is a cloth based towel. In one form, the towel is a cloth towel configured for a cloth recirculation towels system. In another form, the towel is dispursed on a roll and is a paper-based towel configured to be torn off once a portion of the towel is dispursed from the dispensing slot.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a highly schematic view of a hygienic dispenser in one form.

[0013] FIG. 2 is a highly schematic view of a hygienic dispenser in use in one form.

[0014] FIG. 3 is a side cutaway view of a hygienic dispenser in one form.

[0015] FIG. 4 is an isometric cutaway view of a hygienic dispenser in one form.

[0016] FIG. 5 is an isometric exploded view of a hygienic dispenser in one form.

[0017] FIG. 6 is a detailed view of the hygienic dispenser as shown in FIG. 5.

[0018] FIG. 7 is a detailed view of the hygienic dispenser as shown in FIG. 5.

[0019] FIG. 8 is an isometric view of a hygienic dispenser with the front cover removed.

[0020] FIG. 9 is a side cutaway view of a hygienic dispenser using an “endless” roll of product.
DESCRIPTION OF THE PREFERRED EMBODIMENTS

Prior art dispensers, such as paper towel dispensers, toilet paper dispensers, and other dispensers for paper products distributed on rolls, generally fell into two categories. The first category is that of the touchless sensor-type dispenser, which is often found in public restrooms today, and a second category of pushbutton or manual advance dispensers wherein the user must contact a surface of the dispenser, either to push a button or to advance a manual assembly to receive a portion of the desired product. The products in these categories have faced substantial difficulties. For example, with the common “touchless” dispensers, the sensor has proven to be relatively problematic in its responsiveness to different individuals. Furthermore, as the sensor is usually positioned on or behind the casing of the dispenser, often users will still come in contact with the portion of the casing or the sensor space. Thus germs and diseases can be transmitted from person to person. For the pushbutton or manual dispensers, it will always be necessary for the user to come in contact with the dispenser to activate or utilize the dispenser, and thus germs are even more likely to be transmitted from person to person.

This disclosure relates to a dispenser which in one form is a motorized electric dispenser, designed to be a low-cost device having a reduced footprint. The dispenser electromechanically dispenses a pre-determined length sheet of material to the user, without the requirement of a touchless sensor, or the user needing to directly touch any part of the dispenser while the hygienic portion is functioning properly. In the event that the hygienic portion is not functioning properly, a manual advance assembly may also be utilized. One objective of the device in one form is to provide a variable length material to the user in accordance with industry standards, without the use of the standard “touchless” sensors. In another form, the entire roll of material remains sanitary and enclosed within the dispenser until it is dispensed. There is no “fail” projecting from the dispenser in one form that may be a source of cross-contamination.

Looking to FIG. 1, the dispenser 20 is shown, wherein a portion of the product 22 to be dispensed is exposed through an engagement opening 24 in the front casing 26 of the dispenser 20. It can be seen that the user 28 is reaching towards the exposed portion 30 of the product 22 in the direction of travel 32. Behind the exposed portion 30 is a pushbutton activator which engages the dispenser 20 to dispense a portion of product as shown in FIG. 2. The activator may be a standard electric button, switch, proximity sensor, heat sensor or similar, equivalent device. As the user 28 withdraws their finger or other appendage in the direction of travel 34, the product 22 is dispensed in one form of the bottom of the dispenser in the direction of travel 36.

Before beginning a detailed description, an axes system 10 is shown in FIG. 1 comprising a vertical axes 12, a transverse axes 14, and a longitudinal axes 16. This axes system 10 is intended to aid in understanding of the disclosure herein, and is not intended to be limiting.

Looking to FIG. 3 the dispenser 20 is shown in one form in a side cutaway view, which should help in understanding the interior configuration of the device. In one form, a product roll 38, such as a roll of paper towels or toilet paper, is suspended upon a roll support 40 which can also be more easily seen in FIG. 7. Alternatively, the product roll 38 may simply rest on an inner portion of the casing or mechanism.

Looking briefly to FIG. 4, the dispenser 20 is shown in an isometric cutaway view which more clearly shows the dispenser housing 42, which substantially comprises a front casing 44 coupled to a rear casing 46 at a casing pivot 48 (which is more easily shown in FIG. 3). The rear casing 46 is operatively configured to be attached to a vertical structure such as a bathroom wall by way of fasteners, such as screws, mounted through a plurality of mounting recesses 50. While the casing pivot 48 couples the rear casing 46 to the front casing 44 at the lowest portion of the dispenser 20, a latching mechanism (not shown) may be provided in the upper region such as at a latching mechanism opening 52. The dispenser 20 also comprises a dispensing slot 54 at the bottom portion of the dispenser 20, through which the product 22 is dispensed, as shown in FIG. 2.

Looking specifically at the lowermost front portion of the dispenser 20, as shown in FIG. 4, an engagement opening 56 is provided to allow a user access to a button mechanism generally at 58. The engagement opening 56 is defined by an opening rim 60 around the engagement opening 56. The opening rim 60 may be provided in the front casing 44 as shown in FIGS. 1 and 2, or alternatively may be provided in a replaceable cover panel 62 as shown in FIG. 5. The button mechanism comprises a contact surface 64, which in operation is behind the exposed portion 30 of the product 22, as previously described. In this arrangement, when the user presses on the contact surface 64 through the product 22, the dispenser is activated and dispenses a portion of product through the dispensing slot 54. The portion of product dispensed includes the portion that the user contacted during the engagement opening 56. Thus, a sanitary condition is constantly maintained.

Looking to FIG. 3, a product path 66 is shown, which is defined as the path the product 22 travels between the product roll 38 and a dispensing slot 54. As can be seen, the product path 66 passes between the opening rim 60 and the contact surface 64 of the button mechanism 68.

Thus, the exposed portion 30 of the product 22 provides a sanitary, constantly replaceable barrier between the user 28 and the button mechanism 68. In one form of operation, a cutting edge 70 is provided as shown in FIG. 3. The cutting edge 70 functions to allow the user 28 to cut, or tear, the product 22 along a substantially straight or desired line. When a cutting edge 70 is utilized, the device comprises a minimum dispensed length 72 defined as the distance between the opening rim 60 and the cutting edge 70. In one particular example, the device comprises a minimum dispensed length 72 defined as the distance between the upper edge 73 of the opening rim 60 and the cutting edge 70. Of course, the dispensed length could be substantially longer than this, and may be adjustable by service personnel or could be pre-set as the dispenser 20 is built.

In one form, seen in FIGS. 3-8, the paper path 66 passes between a drive roller 74 and a pressure roller 76. The pressure roller 76 generally presses against the drive roller 74. In this way, when the drive roller 74 is caused to rotate, the product 22 will tend to be dispensed, as it is pressed against the drive roller 74 by the pressure roller 76. In one form, the pressure roller 76 is coupled to the front casing 44. In this way, when the latching mechanism is released, and the front casing 44 pivots about the front casing pivot 48, the distance between the drive roller 74 and the pressure roller 76 will open up. Thus, when a replacement product roll 38 is inserted into the dispenser 20, it is much easier for the service personnel to
direct the product 22 down the product path 66 and between the drive roller 74 and pressure roller 76. As the front casing 44 is rotated to a closed position, and the latching mechanism is reengaged, the product 22 is positioned along the product path 66 and is ready for dispensing.

[0030] Looking to FIG. 5, the relationship of the pressure roller 76 to the cover panel 62 and front casing 44 can be seen. Looking to FIG. 6, which is a detail view of this portion of FIG. 5, it is seen how in one form, the pressure roller 76 is inserted into a bearing surface 78 of a spring clip 80. The spring clip 80 allows the pressure roller 76 to rotate about an axle end 82. In one form, the spring clip 80 is press fit within a receiver 84, which is coupled to the front casing 44. Furthermore, the spring clip 80 comprises a spring arm 86 which functions to pressure or force the pressure roller 76 against the drive roller 74. In one form, the cover panel 621a and spring clip 80 from the view of the user 28. It can also be seen that the opening rim 60, as previously described and shown in FIG. 4, may comprise an opening rim 60b in the cover panel 62, and another opening rim 60a in the front casing 44. As previously described, this opening rim 60 allows the user access to the button mechanism 68 through the exposed portion 30 of the product 22.

[0031] Looking back to FIG. 5, a powered advance assembly 88 and manual advance assembly 90 are shown. The powered advance assembly 88 generally comprises the drive roller 74 previously discussed, and a drive motor 92. In addition, a plurality of reduction gears 94 may be utilized to couple the drive motor 92 to the drive roller 74. Looking to FIG. 7, which is a detail view of a portion of FIG. 5, it can be seen how an end cap 96, axle 98, and drive gear 100 may be utilized to couple the drive roller 74 to the drive motor 92. A power source 102 such as a battery, series of batteries, power supply, or power adapter can be utilized to electronically couple a button mechanism or contact surface 104 to the drive motor 92. In one form, the circuit between the power source 102 and the drive motor 92 may include an open circuit between the contact surface 104 and another portion 106 such that when the contact surface 104 is pressed by the user, the circuit is closed. In addition, the circuit 108 may comprise a timing circuit 110 such that when the circuit 108 is closed, the drive motor 92 will operate for a certain amount of time, corresponding to the minimum dispensing length 72 to dispense the desired length of product. This time interval may in one form be adjustable by service personnel. In one form, the power source 102 is coupled to a standard household power source, such as a 110V AC circuit commonly found in US structures. In one form, a pawl 112 is provided which may couple to a side frame 116 at a pawl receiver 114. This pawl 114 prohibits the drive roller 74 from rotating backwards, which would tend to draw the product 22 back up toward the product roll 38 along the product path 66. This may in some forms make it very difficult for the user to reengage the device, as most users will not have access to the interior portion of the dispenser 20.

[0032] A manual advance assembly 90 may also be incorporated as shown in FIG. 5. Manual advance assemblies are often utilized, as it is not uncommon for the powered advance assembly 88 to become non-functional, such as when the drive motor 92 no longer functions, or when the power source 102 no longer functions, such as when batteries are depleted. The manual advance assembly generally comprises a manual advance driver 118 which is exposed through the dispenser housing 42 such that a user 28 can manually engage the manual advance driver 118. As shown, the manual advance driver 118 comprises a disc-like wheel which is configured to substantially prohibit a user from rotating the manual advance driver 118 in a non-desired direction. These drivers 118 are well-known in the art, and also comprise pushbuttons, cranks, spurred wheels, and equivalents. In one form, the manual advance driver 118 is coupled in such a way that when it is rotated, the drive motor 92 is not rotated, to increase ease in use. Such one-way drive mechanisms and one-way bearings are well-known in the art.

[0033] Also looking at FIG. 7, it can be seen how in one form, each of the roll supports 40 are removably attached to the rear casing 46 at a support receiver 120. In one form, a snap lock-type mechanism 122 is utilized to maintain the roll support within the support receiver 120. Additionally, a projection 124 can be utilized as an axle to engage the inner surface of the product roll 38.

[0034] Looking now to FIG. 8, the dispenser 20 is shown with the front casing 44 removed to show the workings of the mechanism. As shown, the manual advance driver 118 extends through a casing opening 126 such that it can be reached and operated by a user. As the advance driver in one form is recessed into the side of the dispenser, it will be more obvious to the user to utilize the button mechanism 68 in the front of the dispenser. Additionally, as the button mechanism 68 will not be visible to a user, as it will be behind the exposed portion 33 of the product 22, there will likely be indications on the front casing 44, such as on the cover panel 62, to direct a user to press through the opening rim 60 and engage the button mechanism 68 to dispense a portion of product 22.

[0035] Looking to FIG. 9, another embodiment is shown where the minimum dispersed length 128 is defined as the length between the opening rim 60, and the dispensing slot 54. This embodiment may be utilized where the dispensed portion is not torn off by the user, but rather is cut by other methods, such as a cutter mounted on the drive roller, or pre-cut towels. This embodiment may also be utilized such that the product is not removed at all, but rather comprises a return path 130 back into the dispenser 20, such as would be utilized in a continuous, cloth-type towel.

[0036] While the present invention is illustrated by description of several embodiments and while the illustrative embodiments are described in detail, it is not the intention of the applicants to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications within the scope of the appended claims will readily appear to those sufficed in the art. The invention in its broader aspects is therefore not limited to the specific details, representative apparatus and methods, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of applicants’ general concept.

Therefore I claim:
1. A hygienic dispenser for dispensing a length of product from a roll, the dispenser comprising:
   a. a dispenser housing;
   b. a surface defining an engagement opening in the dispenser housing;
   c. a dispensing slot;
   d. a button mechanism adjacent the engagement opening;
   e. a product path defined as the path product will take from the product roll to the dispensing slot; and
   f. wherein the product path passes between the engagement opening and the button mechanism.
2. The hygienic dispenser of claim 1 further comprising:
   a. a pressure roller adjacent the drive roller; and
   b. the pressure roller is operatively configured to provide
      frictional engagement between the product being dispensed
      and the drive roller.
3. The hygienic dispenser of claim 2 further comprising:
   a. a front casing;
   b. a rear casing;
   c. wherein the front casing is rotatably coupled to the rear
      casing; and
   d. wherein the pressure roller is coupled to the front casing.
4. The hygienic dispenser of claim 1 further comprising a
   manual advance assembly.
5. The hygienic dispenser of claim 4 further comprising a
   one-way-rotational device operatively configured to allow a
   user to manually operate the manual advance mechanism in
   only one direction.
6. The hygienic dispenser of claim 1 wherein the dispenser
   is operatively configured to dispense a length of product at
   each operation of the button mechanism greater than the
distance along the paper path from the engagement opening
   to the dispensing slot.
7. The hygienic dispenser of claim 6 further comprising:
   a. a cutting edge coupled to the dispenser housing; and
   b. wherein the length of product dispensed at each operation
      of the button mechanism is greater than the distance
      along the paper path between the engagement opening
      and the cutting edge.
8. The hygienic dispenser of claim 7 wherein the length of
   product dispensed at each operation of the button mechanism
   is greater than the distance along the paper path between the
   upper edge of the engagement opening and the cutting edge.
9. The hygienic dispenser of claim 1 further comprising:
   a. a drive motor coupled to a drive roller;
   b. wherein the drive roller is operatively configured to
      engage the product being dispensed;
   c. circuitry coupled between the drive motor and the button
      mechanism; and
   d. wherein the button mechanism is operatively configured
      to activate the drive motor when thebutton mechanism is
      engaged.
10. The hygienic dispenser of claim 1 further comprising a
    product roll support within the dispenser housing.
11. A hygienic dispenser for dispensing a length of product
    from a roll, the dispenser comprising:
   a. a dispenser housing;
   b. a surface defining an engagement opening in the dis-
      penser housing;
   c. a dispensing slot;
   d. a button mechanism adjacent the engagement opening;
   e. wherein a portion of the product is positioned between
      the engagement opening and the button mechanism
      prior to exiting the dispenser.
12. The hygienic dispenser of claim 11 wherein the dispens-
    ing slot is positioned adjacent the bottommost surface of
    the dispenser.
13. The hygienic dispenser of claim 11 wherein the surface
    defining an engagement opening is positioned at the front
    surface of the dispenser.
14. A towel dispenser configured to dispense a towel there-
    from, the towel dispenser comprising:
   a. a casing comprising an interior chamber portion, the
      interior chamber portion configured to house a towel
      roll;
   b. the casing comprising a rearward portion and a forward
      portion, the forward portion comprising a perimeter sur-
      face defining an engagement opening;
   c. a towel dispensing portion configured to dispense a
      portion of the towel therefrom;
   d. an activator member;
   e. the activator member positioned in proximity to the
      engagement opening of the casing;
   f. the towel configured to be interposed between the activ-
      ator member and the engagement opening of the casing
      to be visible therethrough;
   g. the engagement opening comprising a distance from a
      towel dispensing slot which is less than the length of
      the towel that is disbursed when the activator member is
      activated, ejecting a portion of the towel therefrom.
15. The towel dispenser as recited in claim 14 configured
    such that when a user depresses a portion of the towel through
    the opening to activate the activator member, the portion of
    the towel depressed by the user is dispensed through the towel
    dispensing portion.
16. The towel dispenser as recited in claim 15 where the
    towel is a cloth based towel.
17. The towel dispenser as recited in claim 16 where the
    towel is a cloth towel configured for a cloth recirculation
    towels system.
18. The towel dispenser as recited in claim 15 where the
    towel is disbursed on a roll and is a paper-based towel con-
    figured to be torn once a portion of the towel is disbursed from
    the dispensing slot.

* * * * *