[Referring next to FIG. **11**, a circuit for implementing the controller **532** includes an MSP43OF1121 microprocessor **560** manufactured by Texas Instruments. The integrated circuit **560** is actuable by the switch **500***a*. More specifically, the switch **500***a* is of the two-pole, three-throw type and includes contacts CON**1**-CON**8**. When the switch **500***a* is in the middle or off position, contacts CON**2** and CON**3** are connected to one another as are contacts CON**6** and CONT**7**. Accordingly, no power is supplied to the contact CON**5** or the contact CON**8**, and hence, the various components illustrated in FIG. **11**, including the integrated circuit **560**, are off. When the user moves the switch **500***a* to the first on position, the contacts CON**2** and CON**4** are connected to one another as are the contacts CON**6** and CON**8**. The contact CON**6** is connected to the positive terminal of series-connected batteries **232**, and thus is at a potential of approximately three volts above ground. This voltage is delivered through the contact CON**8**, a diode D**1**, and an inductor L**1** to develop a voltage VCC. A capacitor C**1** is connected between the voltage VCC and ground. The LC circuit formed by the inductor L**1** and the capacitor C**1** smooth voltage variations so that the voltage VCC remains at a substantially constant level. The voltage VCC is applied to a pin **2** of the integrated circuit **560**. Further, ground potential is supplied to a pin **4** of the integrated circuit **560**. A capacitor C**2** is coupled between the pin **2** and the pin **4** of the integrated circuit **560**.

A crystal **564** is connected between a pin **5** and a pin **6** of the integrated circuit **560**. The crystal **564** establishes a time base for an internal clock of the integrated circuit **560**.

A pin **13** of the integrated circuit **560** is connected to the contact CON**1** and a first end of a resistor R**1** wherein a second end of the resistor R**1** receives the voltage VCC. Pins **8-11** of the integrated circuit **560** are coupled through resistors R**2**-R**5** to pins **4**, **1**, **8**, and **3**, respectively, of a further integrated circuit **568**, comprising a ZHB6718 SM-8 Bipolar Transistor H-Bridge integrated circuit sold by Zetex PLC of the United Kingdom. Resistors R**6** and R**7** are connected between the pins **4** and **8**, respectively, of the integrated circuit **568** and the positive terminal of the series-connected batteries **232**. The pins **1** and **3** of the integrated circuit **568** are connected by resistors R**8** and R**9**, respectively, to ground. In addition, the positive terminal of the series-connected batteries **232** and ground are coupled to pins **6** and **2**, respectively, of the integrated circuit **568**. Pins **5** and **7** of the integrated circuit **568** are coupled to first and second terminals of the drive motor **400**. A capacitor C**3** is coupled across the drive motor **400**.

A pin **15** of the integrated circuit **560** is connected to a junction between a resistor R**10** and the second switch **528**. The resistor R**10** and the switch **528** are connected between the voltage VCC and ground.

In addition to the foregoing, a negative terminal of the series-connected batteries **232** is connected through an inductor L**2** to ground. The integrated circuit **560** can be reset by applying a low state signal to a pin **7**. A resistor R**11** is connected between the pin **7** and the voltage VCC. A pair of capacitors C**4** and C**5** are connected between positive and negative terminals of the series-connected batteries **232**.]

When the switch **500***a* is in the second on position, a high state signal is supplied to the pin **13** of the integrated circuit **560**, thereby causing operation in the timed mode as shown in FIG. **7**. This high state signal instructs the integrated circuit **560** to begin the startup delay period. Upon expiration of the startup delay period, appropriate signals are developed at the pins **8-11** of the integrated circuit **560** at the beginning of the first spray period to cause the integrated circuit **568** to energize the drive motor **400** in a first direction. The drive motor **400** rotates the motor gear **408**, in turn rotating the gears **412**, **420**, and **428**, thereby moving the actuator arm **30** downwardly. This downward movement depresses the valve stem **278** of the container **60**, thereby causing a spraying operation. This motor energization continues for a predetermined amount of time, at the end of which the signals developed at the pins **8-11** of the integrated circuit **560** change to opposite states. The integrated circuit **568** then energizes the drive motor **400** in a second direction, thereby reversing the downward force on the actuator arm **30** and the valve stem **278** of the container **60**. The actuator arm **30** and the valve stem **278** then move upwardly in response to upward movement of the arm **30** and the upward force provided by the valve stem **278** so that further release of the contents of the container **60** is prevented.

Following the termination of spraying during the first spray period, the integrated circuit **560** enters the first sleep period. During this time low state signals are developed at the pins **8-11** of the integrated circuit **560** so that the drive motor **400** is kept in an off condition. Upon expiration of the first sleep period, the integrated circuit **560** again develops appropriate signals at the pins **8-11**, thereby causing the integrated circuit **568** to energize the drive motor **400**. As before, the actuator arm **30** and the valve stem **278** move downwardly, thereby discharging a spray of liquid from the container **60**. At the end of this second spraying period, the integrated circuit **560** again develops opposite signals at the pins **8-11**, thereby moving the arm **30** upwardly until an end-of-travel limit is reached, whereupon the signals at the pins **8-11** of the integrated circuit **560** all revert to a low state. The drive motor **400** is thus deenergized via the integrated circuit **568** and the integrated circuit **560** prevents further spraying until the expiration of the second sleep period. The integrated circuit **560** thereafter alternates between further spraying and sleep periods as noted above.

At any time during any of the sleep periods, a user can command manual spraying of the container **60** by depressing the switch **528**. This action causes a signal developed at the pin **15** of the integrated circuit **560** to transition from a high state to a low state. When this transition is detected, the integrated circuit **560** energizes the drive motor **400** via the pins **8-11** and the integrated circuit **568**. At the termination of the spraying operation, the integrated circuit **560** begins timing of a further sleep period, following which a spraying operation is again undertaken.

When the switch **500***a* is moved to the second on position, a high state signal is provided to the pin **13** of the integrated circuit **560**, thereby causing the integrated circuit **560** to enter the combined timed/sensor mode of operation. In this mode of operation, the first spraying operation is undertaken following a startup delay period and a sleep period is initiated at the end of the spraying operation, as seen in FIG. **10**.

[As seen in FIG. **11**, a motion detector circuit **570** includes the sensor **524** in the form of a photoresistor coupled between ground and a first end of an AC coupling capacitor C**6**. A second end of the capacitor C**6** is coupled to a base electrode of a PNP bipolar transistor Q1. The base of the transistor Q1 is coupled to a first end of a biasing resistor R12. A second end of the biasing resistor R12 is coupled to ground. A further resistor R13 is coupled between an emitter electrode of the transistor Q1 and the photoresistor **524**. A capacitor C7 is coupled across the emitter electrode and a source electrode of the transistor Q1. A resistor R14 is coupled between the source electrode and ground.

The resistor R13 and the photoresistor **524** act as a voltage divider. The changing resistance of the photoresistor **524** in response to changing light conditions causes a varying voltage to be developed at the junction between the resistor R13 and the photoresistor **524**. An AC component of this varying voltage is delivered to the base electrode of the transistor Q1. The transistor Q1 is operated in the linear mode and the components C7 and R14 act as a low-pass filter. The component values are selected so that a signal is developed on a line **572** for each transition in light received by the photoresistor **524** occurring over a short interval. Thus, a signal is developed on the line **572** when a person passes in front of the photoresistor and again when the person moves sufficiently to unblock the photoresistor. No signal is developed on the line **572** when the light transition is developed over a long period of time, such as at dusk or dawn. Each time a signal is developed on the line **572**, the integrated circuit **560** pulls the pin **14** thereof to a low voltage for a brief period of time, such as 0.25 second, to energize a light emitting diode LED1 (also seen in the embodiment of FIG. **12**). The integrated circuit **560** uses either a high-to-low transition or a low-to-high transition in the signal on the line **572** as a trigger to cause a spraying operation, either immediately or after a delay period, provided that the circuit **560** is not in the sleep mode. The controller **532** operates in accordance with the timing diagram of FIG. **10** during this mode of operation.]

FIG. **12** shows another embodiment incorporating the controller **532** and which is identical to the embodiment of FIGS. **8** and **9**, except as noted below.

The embodiment of FIG. **12** includes two slots **600** disposed within the bottom surface **204** of the recess **200**. The batteries **232** (not shown in FIG. **12**) are secured by way of an interference fit between terminals within the two slots **600** and respective terminals on an opposing wall of the recess. The embodiment of FIG. **12** also includes a groove **604** within the overhang portion **308**. The groove **604** faces the front side **132** of the housing **20** and is dimensioned to receive the valve stem **278** therein. The present embodiment further includes a recess (not shown) disposed on the lower side **320** of the overhang portion **308**. The recess is sufficiently sized to allow entry of a portion of the distal end **282** of the valve stem **278**. The recess acts as a centering mechanism to align the valve stem **278** with the second orifice **324** and/or as a directional guide for the discharged contents. A second recess **608** is disposed on the opposite side of the overhang portion **308**. The recess **608** may have a cross-sectional size larger than the size of the dispensing bore **324**. Further, the cross-sectional size of the recess **608** may vary, e.g., the recess **608** may have a circular shape with a diameter that is smaller adjacent the dispensing bore **324** than the diameter of the recess **608** adjacent the opposite side of the overhang portion **308**. When the valve stem **278** is depressed by the downward motion of the overhang portion **308**, the fluid dispensed from the container **60** traverses the recess, the dispensing bore **324**, and the second recess **608** before being discharged into the atmosphere. The dispensing bore **324** and/or the second recess **608** may discharge the fluid in a direction normal to an axial length of the container **60** or at any angle therefrom.

With regard to the embodiments depicted in FIGS. **1-6**, **8**, **9**, and **12**, the dispensers **10**, **10***a*, and **10***b* may have numerous varying characteristics. For example, the overhang portion **308** or the actuator arm **30** may impart a force onto any area of the valve stem **278** to depress or tilt same.

If desired, the slot **128** may be dimensioned to form an interference fit with the container **60**. In yet another alternative, a portion of the container **60**, such as the upper portion, is provided with a groove, protrusion, or any other engaging mechanism for interaction with a complementary protrusion, groove, or engaging mechanism, respectively, located on or within the inner wall **136** or any other wall of the dispenser. Further, the inner wall **136** may be angled or tapered inwardly (i.e., toward a center of the slot **128**) from bottom to top. The tapering of the inner wall **136** provides for an engagement surface with the neck **228** or any other engagement member of the container **60**. Some of the engaging mechanisms assist in keeping the container **60** within the recess **200** and in alignment with the actuator arm **30**. Other engaging mechanisms allow for a broader spectrum of container sizes to be used with a single dispenser. For example, a dispenser that has an engaging mechanism for interaction with the neck of a container could hold and align a container having a bottom end thereof in contact with the bottom surface **204** of the recess **200**, or a bottom end thereof suspended above the bottom surface **204** of the recess **200**.

As a still further alternative, the motor **400** may be driven in two directions to open and close the valve assembly **274**. In this case, when spraying is to be terminated, the motor is energized in a second direction to reverse the downward force on the actuator arm **30** and the valve stem **278**. The actuator arm **30** and the valve stem **278** then move upwardly to the pre-actuation position in response to upward movement of the actuator arm **30** and the upward force provided by the valve assembly **274**, at which time the valve assembly **274** of the container **60** is closed.

In yet another alternative, the axles **418**, **426**, and **432** are not molded into the inner rear panel **144**. Instead, the axles **418**, **426**, and **432** are mounted into a steel or metal plate, wherein the axles **418**, **426**, and **432** cantilever from the plate to provide support and alignment.

It is also envisioned that different alternatives of the dispenser may have the ability to hold and spray one or more containers having the same or different products. Further, the dispenser could spray the contents of the containers at the same time or at selected intervals and sequences.

FIGS. **13-16** depict several other embodiments of the present dispensers **10**, **10***a*, and **101**), which are characterized by the inclusion of a front cover **650** disposed adjacent the front side **132** of the housing **20**. FIG. **13** shows one specific embodiment of a front cover **650** in an open position. FIG. **14** depicts the embodiment of FIG. **13** in a closed position. Closing the front cover **650** prevents the user from viewing the batteries **232** and the container **60**. The front cover **650** is mounted to the first or second sidewall by a hinge (not shown). The front cover **650** is also contoured adjacent the overhang member **308** to ensure that the front cover **650** does not block or obstruct the flow path of the fluid dispensed from the second orifice **324** of the actuator arm **30**.

The front cover **650** of FIGS. **13** and **14** is fashioned to allow the second switch **528** to be depressed when the front cover **650** is closed. The user applies pressure to the front cover **650** adjacent an area **654** to actuate the second switch **528**. When the user presses the area **654**, the front cover **650** is forcibly rotated about the hinge from the closed position a sufficient distance to cause an inside of the front cover **650** to contact and depress the second switch **528**. Release of the

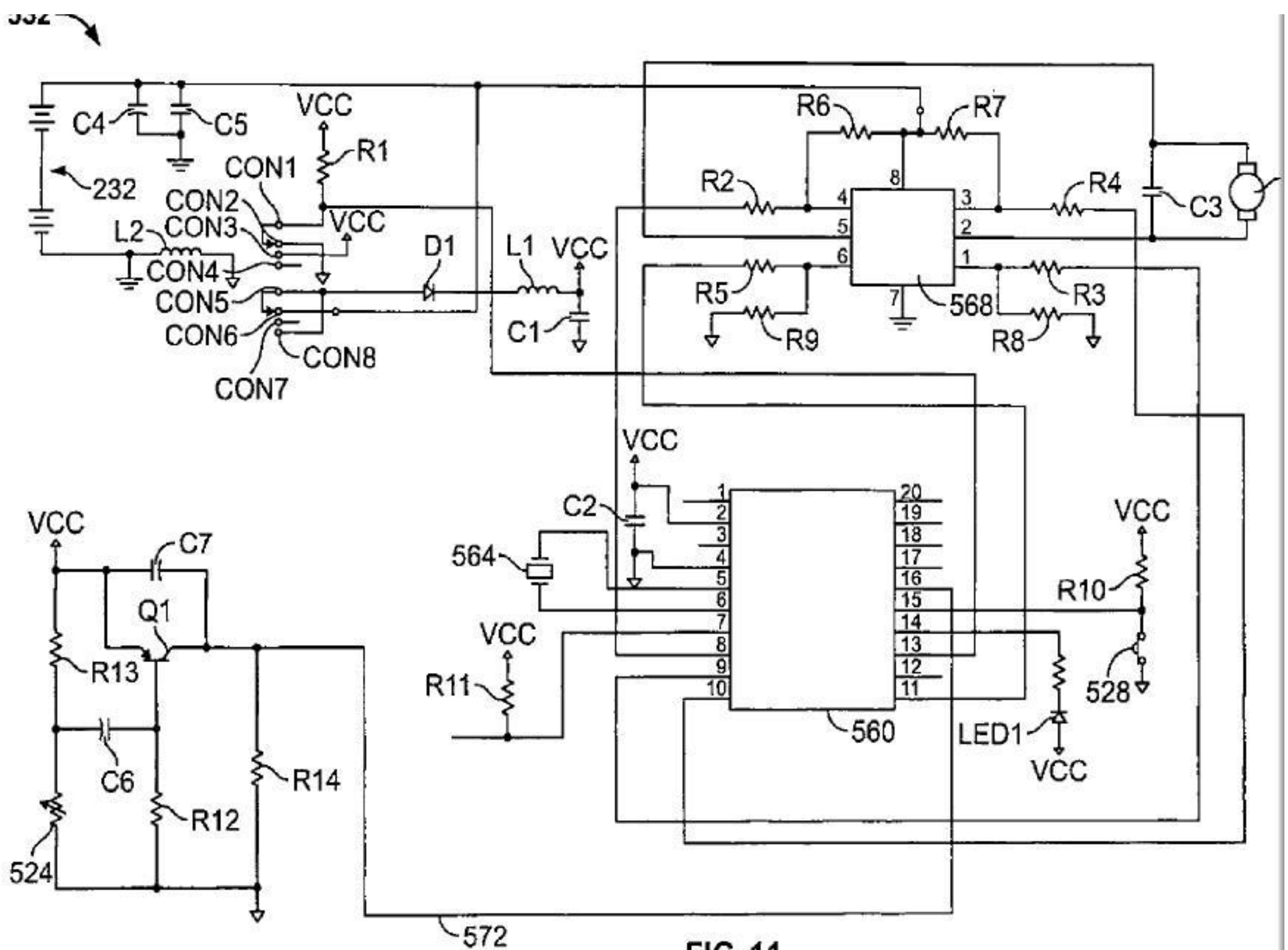
532
232
C4
C5
VCC
R1
CON1
CON2
CON3
CON4
CON5
CON6
CON7
CON8
L2
D1
L1
C1
R2
R3
R4
R5
R6
R7
R8
R9
C3
568
C2
564
560
R10
R11
528
LED1
C7
Q1
R13
C6
R12
R14
524
572

FIG. 11