An apparatus for launching sheets such as paper money. The apparatus includes an upper housing and a lower housing detachably coupled to the upper housing. The apparatus includes a feed assembly, mounted to an interior space of the lower housing, and the feed assembly includes a plate with a planar upper surface for receiving the sheets and at least one spring element applying a spring force upon the plate to urge the planar upper surface toward the upper housing. The apparatus also includes an ejection assembly, supported within an interior space of the upper housing, adapted to sequentially eject the sheets from an opening in the upper housing or the lower housing. The ejection assembly includes an electric motor and a battery selectively powering the electric motor. Spaced apart wheels are provided on an axle driven by the motor to eject the sheets a distance of one to three feet.
APPARATUS FOR SELECTIVELY EJECTING OR LAUNCHING CURRENCY, COUPONS AND ADVERTISING FLYERS, AND OTHER PLANAR SHEETS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 61/797,693, filed Dec. 13, 2012, which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] 1. Field of the Description
[0003] This description is generally directed toward devices for shooting currency (i.e., paper money) and similar planar sheets of typically flexible material into the air, and, more particularly, to an apparatus adapted for selectively dispensing a user-selectable amount of currency or other sheets a distance into the air such as over the heads of an audience or crowd of onlookers (e.g., a group of people attending a game or a concert or dancing at a nightclub, conference, tradeshow, restaurant, or other business/facility).

[0004] 2. Relevant Background
[0005] In the world of nightlife, entertainment, and strip clubs, when someone throws a stack of paper money in the air, it is known as “Making It Rain.” There are numerous recorded events in the press of celebrities and non-celebrities Making It Rain in nightclubs, strip clubs, bars, VIP lounges, concerts, sporting events, music venues, or special events. These “rainmakers” are typically wealthy people or those that just want to show off and appear wealthy to everyone around. They go out and throw stacks of cash in the air to exotic dancers on stage, in a crowd of people, or from an indoor second story balcony. By Making It Rain, they are then given special treatment by venue ownership, their employees, and the general public.

[0006] In other settings, coupons and flyers are released above the heads of crowds attending sporting events, concerts, and many other settings. This may involve a vehicle such as a blimp, a flying quadcopter, drone, plane, helicopter, or other flying device being remotely controlled to fly over the stands and to open a trap door to drop a number of coupons or flyers into the air with gravity taking the released pieces of paper down into the arms of the waiting crowd.

[0007] There remains a need improved devices for allowing a person to more effectively and more enjoyably “Make It Rain.” Preferably, such devices would replace the manual technique presently used by most rainmakers. Also, it would be desirable for the devices to provide more control features to the operator in contrast to gravity-based devices (where the trajectory and quantity are difficult to control) and to manual techniques (where the thrown quantity and rate is hard to manage).

SUMMARY

[0008] To address these and other needs, the inventor designed the first ever, automatic, and mobile “Rainmaker.” This is an apparatus that is useful for selectively ejecting or launching currency of any nation (paper money), coupons, advertising/informational flyers, promotional materials, and other planar sheets into the air. The apparatus functions “selectively” in that some embodiments allow the user to select when to discharge sheets of material stored within the apparatus from an outlet such as by pressing and holding down an activation button (or moving a switch or pressing an icon in a graphical user interface (GUI)).

[0009] A display window in the housing (or a GUI) may be used to display the number of sheets that have been ejected or the number of sheets remaining in the cartridge (stored in the apparatus such as within the housing). The apparatus may also be selective by allowing the operator to set or throttle the rate the sheets are dispensed/ejected from an outlet of the apparatus (e.g., of the housing) and/or by allowing the operator to select a total number of sheets to eject during one rainmaking/dispensing session. The feed or ejection assembly is designed to launch the sheets outward from the housing outlet a significant distance such as 1 to 3 (or more) feet, which allows the operator to shoot or dispense the sheets (paper money or the like) into the air over a crown in a manner similar to someone manually throwing a stack of bills into the air.

[0010] The inventor understood that the experience of controlling a stream of flying dollar bills creates a sense of fun and excitement that has not been duplicated by anything else in the world prior to the present apparatus. The sheet ejecting apparatus (or “Rainmaker”) is essentially a statement of status. It fits in your pocket and can be used virtually any time or anywhere to let others know that you have no concern for the amount of money you spend. In other settings, the apparatus can be used to effectively distribute coupons and advertising flyers (or any planar sheet of material) in a controlled manner. Using the Rainmaker or sheet ejecting apparatus in public creates excitement, interest, and mystery and will bring opportunity, create relationships, and build memories. The operator will instantly become the center of attention while onlookers both envy them and gravitate in their direction. The inventor is unaware of any similar product available today.

[0011] More particularly, an apparatus is provided for launching sheets of material into the air. The apparatus includes an upper housing and a lower housing detachably coupled to the upper housing. The apparatus also includes a feed assembly, mounted to an interior space of the lower housing, and the feed assembly includes a plate with a planar upper surface for receiving a plurality of the sheets and at least one spring element applying a spring force upon the plate to urge the planar upper surface toward the upper housing. The apparatus also includes an ejection assembly, supported within an interior space of the upper housing, adapted to sequentially eject the sheets from an opening in the upper housing or the lower housing.

[0012] In some embodiments of the apparatus, the feed assembly includes at least four of the spring elements each applying a separate spring force to the plate with a first pair of the spring elements positioned proximate to the opening and a second pair of the spring elements positioned distal to the opening. In such embodiments, the spring elements may each be compression springs, and the spring forces applied by the first pair of the spring elements may be greater than the spring forces applied by the second pair of the spring elements.

[0013] In the same or other embodiments of the apparatus, the ejection assembly may include an electric motor and a battery selectively powering the electric motor. Then, the electric motor may be adapted to rotate an axle(s) when powered by the battery. Further, a pair of spaced apart wheels or rollers can be provided on the axle to rotate with the axle, and the wheels may extend toward the plate of the feed
mechanism to contact an uppermost one of the sheets and to move the uppermost one of the sheets toward the opening when the wheels are rotating.

In such embodiments, the motor may rotate the axle and the attached wheels at a rotation rate whereby the uppermost one of the sheets is ejected a distance of at least 1 foot (e.g., a launch or ejection distance of 1 to 3 feet or more at the particular rotation rate or RPM of the electric motor). The sheets each may be one of: paper money, a paper or plastic coupon, a flexible flyer, and a paper card. Further, each of the wheels may include a lower duriometer material for contacting the uppermost one of the sheets. (e.g., the low duriometer material may be a rubber or a plastic with a duriometer rating of less than about A-80 (or D-50) such as A-15 to A-50 with A-27 being used in one embodiment (e.g., the tire may be a range of soft materials with varying duriometer ratings)). Further, in some cases, the ejection assembly may further include an activation button accessible via an outer surface of the upper housing and, when the activation button is moved from a first to a second position, the electric motor is powered by the battery to rotate the axle with the attached wheels.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective top view of a sheet ejecting apparatus of one embodiment during operation (a rainmaking session or the like) to eject sheets of material (e.g., currency or bank notes);

FIG. 2 illustrates a top perspective view of an embodiment of an apparatus similar to that shown in FIG. 1 with the top or cover of the housing shown to be transparent (rather than opaque or colored) to provide a view of internal components of the apparatus;

FIG. 3 is an exploded side view of another embodiment of a sheet ejecting apparatus (or Rainmaker);

FIG. 4 is a cutaway side view of the apparatus of FIG. 3 during operation of the apparatus to selectively eject sheets of material such as paper money; and

FIG. 5 is a perspective view of the apparatus of FIGS. 3 and 4 upon assembly and with the top housing/cover and base/cartridge being transparent to reveal internal components.

DETAILED DESCRIPTION

Briefly, the present description is directed toward an apparatus that is adapted for allowing an operator to selectively eject or launch a plurality of sheets into the air. The sheets may take many forms to practice the invention including currency (i.e., paper money, bank notes, and the like), coupons, advertising or informational flyers, and the like, and these sheets are typically relatively thin (e.g., less than about 0.05 inches and more typically less than about 0.01 and more typically less than about 0.001 inches (such as about 0.004 inches thickness associated with common paper currency)) and flexible being made of paper, cloth, plastic, or other materials.

FIG. 1 illustrates one such apparatus (which may be labeled a “Rainmaker” or sheet ejecting apparatus) 100 during its operation to rapidly eject 131 sheets 130, 132 of a desired distance, d_{eject}, from an outlet (not shown in FIG. 1). As shown, the apparatus 100 includes a cover or top housing 110 and a base, bottom housing, or cartridge 120. The cartridge 120 is adapted to receive and store a number of sheets 130, 132, which may be thought of as the storing and ejecting capacity of the apparatus (e.g., 10 to 100 or more sheets may be used in some applications such as for apparatus 100 used to shower currency as shown in FIG. 1). The cartridge 120 may also be used to house a feed mechanism or assembly that is adapted to feed or present one sheet at a time for ejection such as with a spring-loaded platform pressing sheets up toward the top housing or cover 120 (in which an eject mechanism or assembly 112 is provided). The cartridge 120 may be adapted for quick removal and later attachment to the top housing or cover 110, which allows the cartridge 120 to be reloaded with additional sheets 130, 132 after it is has been fully or partially emptied by operation of the apparatus 100.

The apparatus 100 may include an eject or launch mechanism or assembly 112 in the top housing or cover 110. The eject mechanism 112 is operable such as in response to a user pressing a button or switch 113 on a top surface (or other surface) 111 of the cover 110. In some embodiments, the user presses and holds the button/switch 113 in the on position/ location to cause the eject mechanism 112 to eject 131 the sheets 130, 132 a distance, d_{eject}, which preferably is 1 to 3 feet or more as measured from the outlet of the housing 110 to a location where the sheet 130, 132 has negligible forward motion (only falls/moves further due to gravity or air currents/wind in the environment).

To add to the experience, a sound system may be provided in the cover 110 that also operates with the pressing of the button/switch 113 to output via speaker(s) 114 a sound (s) corresponding with the ejection 131 of the sheets 130, 132. For example, a Rainmaker 100 may include a sound system to play a soundtrack that sounds like a pouring rain (e.g., a rainforest sound). In other cases, other sounds may be played and output through speaker 114 such as noises associated with a gun being fired with each ejection 131.

The apparatus 100 may be configured to eject a variable number of sheets 130, 132 when the button 113 is pressed. For example, on sequential pressing of the button 113 the apparatus 100 with its ejection mechanism 112 may eject differing numbers of sheets 130, 132 (which may be randomly or sequentially selected by a controller) such as first ejecting 5 sheets, second ejecting 20 sheets, third ejecting 15 sheets, and so on. In other cases, the eject mechanism 112 may simply continuously act to discharge 131 sheets 130, 132 at a fixed rate as long as the button 113 is selected and there are additional sheets remaining in the cartridge 120.

In other cases, the apparatus 100 allows for “selective” ejection of the sheets 130, 132 by a user. To this end, the apparatus 100 is shown to include a display 116 that displays the count or number of sheets 130, 132 that have been ejected by the mechanism 112, which may be configured to count (or calculate based on an ejection rate or motor RPM) the number on an ongoing basis. In other cases, the count display 116 may be used by a controller of the apparatus 100 to display the remaining number of sheets in the cartridge 120 (e.g., subtracting from an original stored amount with each ejection 131). The count display 116 and other user input elements (or user feedback components/displays) may be provided in a touch screen/GUI 115 on upper surface 111, but this is not required as the may move mechanical/electrical devices to enter input and separate counters/displays may be provided on housing 110.

In some cases, the user may be able to adjust or select the maximum quantity of sheets 130, 132 for discharge from apparatus. For example, a user input 118 may be pro-
vided in the GUI 115 or as an input device on surface 111 of the top housing 110, and the user input 118 may be operated by the user to increase or decrease the maximum number of sheets 130, 132 for ejection by the ejection mechanism 112 (e.g., upon a single push and release of button 113, upon multiple pushes and releases of button 113, or upon one or more push and holds of button 113 by an operator/user of apparatus 100). Further, the apparatus 100 may be made more “selective” by including an input element 119 that allows the user to adjust the rate of speed of the ejection mechanism 112 (e.g., the mechanism 112 may include a motor operable at 2 or more speeds), and the displayed value may be a number of sheets per a time period (e.g., 1 to 10 or more sheets per second with one embodiment having a maximum speed of 10 sheets per second and a capacity of 50 to 100 sheets in cartridge 120).

[0027] FIG. 2 illustrates another embodiment of a sheet ejecting apparatus 200 with a configuration similar to that shown in FIG. 1. The apparatus 200 includes a top housing or cover 210 and a base or cartridge 220 removably or detachably attached to the top housing 210. In FIG. 2, the top housing 210 is shown transparent to allow the internal components of the apparatus 200 to be seen (where as the cover often will be fabricated to be opaque and colored).

[0028] The cartridge 220 is adapted for receiving a quantity of sheets (e.g., paper money, coupons, and the like) such as upon a platform 224. The platform 224 may take a shape and size that is similar to that of the received sheets (e.g., rectangular, square, round, and so on), and the platform 224 may completely or nearly fill a recessed surface/opening in the cartridge 220 (e.g., the cartridge 220 may have an open-topped dish or similar configuration) to limit the risk that sheets or other objects will slip under the platform 224. The platform 224 and other components of the cartridge 220 provide a feed mechanism/assembly for the apparatus 200. To this end, one, two, or more springs or spring elements may be placed between the bottom of the platform 224 and the inner surface of the cartridge 220 to urge the platform upward toward the top housing 210. This causes any sheets stored on the platform 224 to be fed one-by-one into the top housing 210 (e.g., only the upper most sheet on platform 224 is exposed so that it can be contacted and forced rapidly out of the apparatus 200 (e.g., out of a slot/opening in an end of the top housing)).

[0029] The apparatus 200 further includes a feed or ejection assembly 250 provided in the top housing or cover 210 to selectively eject sheets from the platform 224 and apparatus 200. The assembly 250 includes a support or frame 252 that attaches an electric motor 254 to the top housing 210 near one end 212 of the housing 210. The assembly further includes a battery 255, which is connected to the motor 254 to selectively (e.g., when an ejection or power on button is pressed by an operator) power or run the motor 254 to eject sheets from the housing 210.

[0030] To this end, the motor 254 turns or rotates an axle 256 (as shown with arrow 259) when powered by battery 255, and a pair of spaced apart wheels 258 that are positioned to contact the platform 224 or a sheet on top of the platform 224 during operation of the apparatus 200. The wheels 258 may be formed of a relative soft material (such as a low durometer rubber (e.g., a durometer of A-80 or less with A-15 to A-35 rubber being used in one exemplary case (e.g., A-27 in one case)) to create a desirable amount of friction with each sheet it contacts on the spring-loaded platform 224. When a sheet is on platform 224 and the wheels 258 rotate 259 with axle 256, a top one of the sheets is “grabbed” due to the upward force applied by the platform on the sheet, the fixed relative position of the wheels 258 in the housing 210, and friction force of the moving wheels 258. This causes the sheet to move with the wheels 258 at a rate of rotation 259 of the wheels 258/axle 256 (which also is defined or set by the diameter of the wheels 258 at the outermost surface/tread), whereby the sheet is ejected or launched out of an opening/outlet in the top housing 210 in end 212.

[0031] As can be seen with embodiments 100 and 200 of FIGS. 1 and 2, the Rainmaker or sheet ejecting apparatus can be loaded with a stack of paper money (or other thin, planar sheets of material). One embodiment is adapted such that the cartridge of the apparatus holds up to about 50 bills or pieces of currency. During use, the user holds the Rainmaker in his palm. Then, with the push of a button, a motor is turned on, and the loaded bills in the cartridge shoot from an end of the Rainmaker out into the air in rapid succession.

[0032] In some cases, there is a small counter display that increments by 1 or another increment as each bill or sheet shoots from the end. The Rainmaker may be designed to provide an operator with the option to pre-set a limit on a counter (or other user input element), which a controller uses to operate the motor to prevent the Rainmaker from shooting more than desired by the operator (e.g., compare a current count to the preset limit and turning off the motor when the limit is matched by the ejected count).

[0033] The Rainmaker is battery operated and is slim enough to fit in a jacket pocket or your pants pocket. Prior dispensing devices such as those found in automatic teller machines (ATMs) are not compact or light enough to allow a user to carry with them in their pocket. Further, ATMs and similar bill dispensers/counters are not configured to purposely shoot dollar bills out a significant distance (e.g., 1 to 3 feet or more from an outlet) with the intention of creating a visual effect of money flying through the air. Additionally, prior devices were simply not configured for the purpose of providing the user excitement or pleasure. Rather, they are strictly for transcating or cataloging money and, hence, provide differing functions. Hence, it is believed that the Rainmaker is a first of its kind. Entertainers, musicians, athletes, strippers, all of their fans, and the general public will be enamored with the idea of owning an embodiment of the Rainmaker as taught herein causing a significant demand.

[0034] In many embodiments, the Rainmaker is designed to fit in the palm of a user’s hand and, to this end, it may have a cartridge and top cover that when combined or assembled have roughly the width and length of paper money in the United States (e.g., of a dollar bill), e.g., dimensions of 2.0 to 3.0 inches wide by 6.0 to 7.5 inches long. The overall depth may be roughly 0.5-0.75 inches or similar to the depth of typical men’s leather wallets (but, of course, this depth value may be larger such as 2 inches deep or larger). The Rainmaker is, hence, only slightly larger than the most popular smart phones on the market today.

[0035] The frame (e.g., top housing and cartridge/base) can be made of plastic (or other useful material) and fabricated by a process such as molding, extrusion, or the another commonly used manufacturing process. In other cases, the frame may be made of one or more metals by a process of casting; molding, forming, machining, joining, or the like. More generally, the materials and manufacturing techniques are not limiting of the present description, and the apparatus may be
made using other techniques of one or more materials chosen to meet the desired weight, look, and feel or to control manufacturing costs or provide desired strength and durability. A list of the materials that can be used to manufacture the frame may include plastic, rubber, aluminum, metal, fiberglass, carbon fiber, glass, jewels, and gems.

[0036] With regard to the cartridge, it may be attached using a hinged and/or there may be a hinged door near the bottom of the top housing or cover, which opens to reveal the bill cartridge. The bill/sheet cartridge may be adapted to hold roughly 50 bills/sheets in good condition (e.g., bills of any denomination when using paper money or bank notes). In some implementations, a number of the cartridges (or “sleeve” or “clip”) may be used that are configured to hold different amounts of paper (e.g., a 25 sheet clip, a 50 sheet clip, a 100 sheet clip, and so on), and all would have differing depths that increase to suit the expected number of sheets being stored therein. With regard to the ejection or launch mechanism, the apparatus may include a battery operated motor mounted toward the top of the top housing or cover. There may be a circular (or other shaped) engage button on the front (or any surface) of the top housing/cover, such as one that is centered width wise and/or near where a user’s thumb location would naturally be while the device is in the palm. During operation, the motor spins on the user holds down the button, and the wheels driven by the motor grab the bill. The motor drives the propulsion of the bills out of a slim opening in the top housing/cover, which may extend the full or a large portion of the width of the device (e.g., at one end or the “top” of the device).

[0037] With regard to ejection, the bills may be shot out from a lying flat position on a slick and smooth ejection surface (e.g., the platform discussed above in the feed mechanism/assembly of the cartridge). The momentum of each bill, generated by the motor and its driven wheels, propels the bills directly out of the opening one after another. With some Rainmakers, the bills may travel roughly 2 feet from the opening before their forward momentum dies and they begin fluctuating down creating the “rain” effect. The Rainmaker may be designed to try to maximize the distance of the paper flying out of the device. Hence, 1 to 3 feet may be a useful distance, but some Rainmakers may be able to achieve a greater distance, and this distance may vary with the media or type of planar sheet being ejected from a particular Rainmaker (e.g., greater distance with a less flexible and/or heavier sheet and so on).

[0038] With regard to a display (which may be provided on a touch screen or similar monitor screen such as those found in smartphones or the like), a counter is incremented as each bill/sheet passes out the end of the case opening, and the display will show the count of the number of bills shot out of the device during each run. There are small “plus” and “minus” buttons in some embodiments near this count display. If a user wishes to pre-set the number of bills to shoot, they can add or subtract from the rain depth/ejection limit by pressing these buttons until the display reads the correct number. The next time the engage button is pressed, bills will shoot out of the device in rapid succession, until the indicated number of bills has been shot.

[0039] As shown in the embodiments of FIGS. 1 and 2, a motor can be provided in the ejection mechanism inside the casing/top housing near the top and one end of the top housing. The motor rotates an axle, on which two foam/rubber wheels are mounted, and the ejection mechanism includes a battery, which powers the motor. In some implementations, a button is provided on the top (e.g., on an inclined portion of the outer surface of the top housing), and the demonstration of dollar bills flying out of the end is clearly visible in FIG. 1.

[0040] With regard to variations in the design of the apparatus, the Rainmaker can be fabricated with various colors, shapes, and styles to provide a desired look and feel. The components of the Rainmaker can be repurposed and integrated as an optional add-on for other devices already in the marketplace. This includes but is not limited to: a cell phone, a tablet, a computer, a wallet, clothing, a hat, shoes, a jacket, a vehicle, an electronic device, a lighter, a container, furniture, lighting, speakers, a watch, sports equipment (e.g., a golf club, a golf cart, a baseball bat, and a helmet), and music equipment (such as a microphone, guitar, a drum, a turntable, a boombox, a digital music player, and the like). For example, a user may have a specific Rainmaker add-on for their cell phone. The Rainmaker case could attach to a cell phone and be powered by the cell phone itself. The Rainmaker motor engagement may be initiated by the user via an app or software on the cell phone.

[0041] Another variation of the Rainmaker may utilize a remote trigger. The Rainmaker could be mounted or installed as part of a separate device. A physical or virtual triggering mechanism to engage the motor could be located in a different area allowing the user to control the flow of bills remotely. The customization and personalization of the Rainmaker for an individual will be important to people who own this device. Hence, there may be design and customizing options made available including but not limited to: engravings, colors, materials, finishes, diamonds, jewels, chrome, gold plated, matte, gloss, wooden, light, and heavy.

[0042] In other embodiments/implementations, the Rainmaker is configured to emit an audible sound from the device as the user is making it rain. That would likely be the sound of rain, thunder, a storm, “ca-ting”, coins dropping onto metal like a slot machine, paper flying through the air, friction of paper rubbing on paper, or other. As discussed above, there may be a feature or an option to have preset “levels” of making it rain. Such as shooting 1 individual bill/sheet, 5 individual bills, 10 bills, 20 bills, or some other preset level. Such an option may also have names associated to it such as “drizzle”, “flood”, “flurry”, “storm”, “drip” or other names. The button to engage the motor may be more of a trigger style button, which could emulate that of a gun, a body part, or even a more ignominious or “secret” type of triggering mechanism that may not be immediately obvious to non owners of the device.

[0043] The “bill” cartridge can be modular and designed to load items other than just paper currency. The concept of replaceable cartridges allows for many different things to be loaded into the device besides paper money. This includes but is not limited to: forms of currency, business cards, marketing materials, flyers, coupons, organization specific “funny money”, game pieces, and so on. In some embodiments, the apparatus is configured to allow a user to increase or decrease the speed of the motor and the speed in which the bills come out of the device. In some cases, there is an option which can be turned on to randomize the number of bills that come out of the device so each time the button is pressed, a random number between 1 and the max bills is shot out one by one in rapid succession. The cartridge, being modular, can be larger or smaller allowing for more than 50 bills or also less than 50 bills to be loaded at one time.
The shooting or ejection mechanism may be made up of one or more motors. The motor wheels may be made of rubber, foam, polystyrene, plastic, synthetics, vinyl, silicon, neoprene, polyurethane, nitrile, or a composite material wheel to purposely obtain friction between the wheel and the top bill which will spin to a certain RPM, touch the bill and shoot the bill out the end of the device. However, the Rainmaker may utilize alternative methods of shooting the paper out of the device. These other methods may be comprised of one or multiple of the following and may include but are not limited to: air, grip, roller, gear, pulley, wheel, motor, light, infrared, laser, feeder, sheet, lever, hinge, spring, latch, drive, guide, sleeve, picker, bar, rod, stacker shaft, belt, feed, sorter, counter, hopper, groove, fan, sensor, optics, engine, magnet, and separator.

The apparatus may include a controller (e.g., a processor to run code in computer readable media on the apparatus) that implements one or more computer programs or software applications to control operation of the apparatus (e.g., control the motor and/or control/generate the displays/GUI and/or perform the counting, throttling, and other actions described herein based on, in some cases, input from a user of the apparatus). The Rainmaker may be adapted to run an application or this remote control application may be run on a separate device such as a smartphone, a tablet, or other computing device, and this application would also be integrated for use with remote Rainmaker locations. This allows a user to locate and operate Rainmakers remotely by use of the application. A user could use the remote control application to control a Rainmaker installed in another geographic location or country from where they are with their Rainmaker or other device. This application could be adapted to integrate live video viewing of the remote Rainmaker location and the venue that the Rainmaker is in so the mobile controlling user can see a live stream of the surrounding and the area that the selected Rainmaker is operating in.

FIG. 3 illustrates an exploded view of another embodiment of a sheet ejecting apparatus 300 of the present description. As shown, the apparatus 300 includes a lower/bottom housing or cartridge 310 that houses and supports a feed assembly 320. The apparatus 300 further includes an upper/top housing or cover 330 that is configured to house and support an ejection assembly 350, and the lower housing 310 can be detachably coupled to the upper housing 330 via connectors 319, 339 provided on mating edges/portions of the two housings 310, 330 (e.g., to allow sheets such as bills or paper money to be loaded into the lower housing or cartridge 310 prior to rainmaking or sheet shooting session). The lower housing 310 is formed with four sidewalls 312 extending up from a base 314 and define an opening 315 for receiving the feed assembly 320. A discharge or ejection outlet or opening 313 is formed in one of the end sidewalls 312 through which sheets (such as currency, coupons, fliers, and the like) may be ejected or launched during operation of the apparatus 300. This is in contrast to the embodiments of FIGS. 1 and 2 in which the outlet/opening was provided in an end wall of the top housing/covers. The lower housing 310 has a height, d_c, that is defined by the sidewalls 312 (e.g., the height of the sidewalls 312) and that is chosen for fully receiving the feed assembly 320.

As shown, the feed assembly 320 includes a planar platform or sheet/bill plate 322, which may take the shape and size of the opening 315 of the lower housing 310. For example, the plate 322 may have a width, W_p, and a length, L_p, that are the same or slightly larger than a sheet to be ejected from the apparatus (e.g., about the size and shape of a piece of currency to be launched from apparatus 300). The plate 322 has an upper receiving/contact surface 323 that may be planar and often is designed to be relatively smooth to reduce friction between a bottom sheet/bill placed against the plate 322 to facilitate ejection of even this final sheet from the apparatus 300. The plate 322 may, in part, be positioned within the lower housing 310 through the use of plate braces 329 and 339.

The feed assembly 320 further includes two or more spring elements (e.g., compression springs) 321 with four shown in the embodiment of FIG. 3. The spring elements 321 are received in grooves/guides in the inner surface of the sidewalls 312 of the lower housing 310 and are selected to be placed in compression (not at their at rest length) when the apparatus 300 is assembled (e.g., the upper housing 330 is coupled with the lower housing 310). The spring elements 321 could be positioned to contact and apply a spring force against the lower surface of the plate 322 (a surface opposite the contact/receiving surface 323).

As shown, though, the plate or tray 322 further includes force receiving elements made up (in this non-limiting example) of a post 324 and a cap or arm 325 extending out from the end of the post 324. The post 324 has a height, H, that effectively defines a sheet capacity of the lower housing/cartridge 310 as a user fills sheets into to the lower housing 310 until the uppermost one is aligned with the top of the arm/cap 325. Upon assembly, the spring elements 321 contact the arms/caps 325 and at least partially compress the spring elements 321 so that these elements 321 apply a spring force upward (or away from the base 314) on the plate 322 causing any sheets/bills supported on surface 323 to be urged toward the upper housing 330 and the ejection assembly 350 mounted therein. To facilitate closing when the apparatus 300 is assembled with no sheets/bills, wheel receiving windows/gaps 328 may be provided in the plate 322 opposite the location of the wheels in the upper housing 330 (as discussed below).

The upper housing 330 defines with sidewalls 332 a space or volume for the ejection assembly 350. Further, the upper housing 330 includes a hole or gap 334 through which a push button switch 336 may be inserted into the apparatus 300, e.g., for connection to a controller (not shown) or to complete an electrical connection between battery 355 and electric motor 360. During use, a user of the apparatus 300 may press the button 336 to cause sheets/bills to be ejected from the opening/outlet 313 in the lower housing 310.

The ejection assembly 350 includes a lid or mounting element 352 that is affixed to the upper housing 330 with fasteners 359. The ejection assembly 350 includes an electric motor 360 that is operable via battery 355 to rotate/drive an axle/axle drive 362. The motor 362 is mounted with frame(s) 356 onto an upper surface of the lid 352, and the battery 355 is placed in battery receptacle 354 and retained in place with battery door 356 and fasteners 357 (which attach to the lid 352).

Two wheels are mounted on the opposite ends of the axle 362 to rotate with the axle 362. Particularly, an assembled wheel 368 is shown in FIG. 3 along with an exploded wheel made up of a wheel hub 364 (that would be affixed to the axle 362 such as with a press fit or the like) and a tire 366 attached to the periphery of the hub 364. The tire 366 has an outer surface or tread 367 selected to better grip or
mate with upper surfaces of sheets/bills on the plate surface 323. The tires 366 extend (at least partially such as one fifth to one third of the circumference of the tire 366 extends for contact with a sheet/bill) through the lid 352 via wheel windows/openings 358 (and through openings 328 in the plate 322 when no sheets/bills are present as shown in FIG. 3). The lid 352 further includes slots 353 for receiving the spring force receiving elements including arms/caps 325 and posts 324 (and spring elements 321) within the upper housing 330 upon assembly of the apparatus 300 (see FIG. 5 where apparatus 300 is shown assembled).

[0054] While not limited to particular components for the features of the apparatus 300, it may be useful to provide exemplary components, materials, and other design parameters that may be used to implement the apparatus 300. The user activation button 336 may be a push button switch 2A/48V. The switch may be an industrial grade metallic chrome illuminated push button switch. When actuated, the switch supplies power to the motor and activates the Rainmaker 300 to cause it to launch bills or flippers or other sheets of material from the device housing 310 through opening 313.

[0055] The upper housing 330 may be fabricated from polyvinyl chloride (PVC) or similar materials, and the upper housing 330 contains the power/activation switch 336 and can be manufactured to include information (e.g., a company name and logo information). The drive motor 360 of the ejection assembly 350 may take the form of a 12V DC motor, and/or the motor 360 may be a double axle (axle 362) DC motor, which can provide about 9,000 RPM at 9 volts DC. In other embodiments, the motor 360 may operate at two or more speeds to allow a user to vary the rate and/or distance at which sheets are ejected by the ejection mechanism.

[0056] With regard to the wheel assemblies, the wheel tires 366 and/or treads/surfaces 367 can be off-the-shelf items or may be custom made to provide correct torque and traction on various media/sheets (which may be fabricated of differing materials with differing surface textures calling for more or less gripping/traction) loaded into the Rainmaker 300 or its bill tray 322 (from paper money from countries such as the United States to custom flippers or coupons or business cards). The wheel hub 364 may be sized to create a proper interference fit with the tire 366 and create a torque required to grab and launch bills/sheets at an optimal or desired velocity from housing 310. The tire 366 has a thickness and durometer/hardness to provide a desired friction (friction) between the wheel and the top sheet or bill. Further, the tread or wheel surface 367 was designed to be smooth or to have a pattern with depth(s) (in the grooves of the tread/surface 376) to provide enhance friction and/or “grab” for various materials used with the Rainmaker 300, from US bills to flyers. In some embodiments, the durometer of the material (e.g., a rubber or soft plastic) used for the tire 366 and its surface 367 was in the range of A-15 to A-80 (i.e., A-27 durometer rubber has proven useful in some cases while another material used was 25 A on the Shore durometer scale (e.g., to provide a tackier surface (which may be grooved or flat to provide more surface area for contact with this “gripper” material)) while the hub 364 was much harder at D-40.

[0057] In some proposed embodiments, the hub will use existing rotational forces to produce airflow. Airflow may be produced by the turbine style spokes of the wheel and will be channeled through slots in the upper and lower housing to flow into the bill or media stack on the upper surface of the plate/tray from the sides. This addition of air flow to the sides of the media stack effectively “fans” the media to separate the bills from each other and, hence, reduces internal friction of the media by supplying a layer of air between bills or flippers or other sheets making it easier to launch or eject bills with less frictional or grabbing force between the upper surface of the topmost sheet and the wheel’s tread/contact surface.

[0058] The upper housing lid 352 holds and captures many of the active components of the device 300 (i.e., the ejection assembly 350). The motor 360 is clamped between the upper housing 330 and upper housing lid 352. The main battery 355 (e.g., a 9V alkaline battery, one or more smaller cell phone type (e.g., lithium ion) batteries, or the like) and any secondary battery (if included) and indicator switch/counter for a display (not shown) are also mounted on the lid 352 to be enclosed within the space defined by the walls 332 of the upper housing 330. Any batteries may be optionally rechargeable (e.g., with a cord that plugs into a connector on the side of the housing similar to a conventional cell phone or other small electronic device such as a digital music player).

[0059] The bill plate 322 holds the media (shown in FIGS. 4 and 5) to be used in the lower housing 310 and engages or forces the media into contact, via receiving/contact surface 323 and spring force provided with spring elements 321, with the motor driven wheels 368 (and an assembly of elements 364, 366, and 367). The feed assembly 320 uses metal plate braces 329 designed to stabilize the spring arms 324/325 and sides of the bill plate 322. The spring elements 321 may be compression springs that are used to help place or push the media into contact with the exposed trends/surface 367 of the wheels with the optimum or a desired amount of contact force.

[0060] The lower housing 310 is adapted to contain the bill plate 322 and springs 321. The lower housing is typically removed from the upper housing 330 (via connectors 319, 339) for loading media into the Rainmaker 300. The lower housing 310 can be released, for example, from the upper housing 330 by depressing a retaining clip on the end of the housings 310, 330 and rotating the lower housing 310 down and away from the upper housing 330. The lower housing 310 and bill plate 322 may in some cases be urged or forced together with springs in or on inner surfaces of the sidewalls 312 of the lower housing 310 and bill plate 322.

[0061] In some cases, a slide switch (not shown in diagram) is included in the apparatus 300. When the Rainmaker unit 300 is "open" (e.g., the lower housing 310 and bill plate assembly 320 removed), the slide switch, which is adapted for controlling power to the illuminated activation switch 336, can be accessed or operate to cutoff power to the switch 336. A small battery (e.g., a 3V lithium battery not shown in FIG. 3) may be used to power this slide switch, and this coin cell switch powers the back lighting of the activation switch 336.

[0062] FIG. 5 illustrates the apparatus 300 in an assembled form with the upper housing 330 and lower housing 310 formed of transparent material to reveal the internal components. FIG. 4 illustrates the apparatus 300 in assembled form and during operation to make it rain or to eject a quantity of sheets. To this end, FIG. 4 illustrates the button switch 336 in a depressed or “On” position that causes power to be provided from the battery 355 to the motor 360. This causes the axle 362 to rotate as shown with arrow 490 in a particular direction of rotation and at a predefined rate, e.g., a rate that is fast enough to eject a preset (or selectable) number of sheets out of the housing 310 per a particular time period (e.g., 1 to 10 sheets per second) and at a rate that is high enough to achieve
a desired launch distance such as 1 to 3 feet or the like with one embodiment ejecting U.S. paper money or bills out about 2 feet from the opening/outlet 313 in the lower housing 310.

[0063] The apparatus 300 is shown to have a loaded or filled cartridge or lower housing 310. Particularly, a stack 396 of sheets (such as paper money) has been placed onto the plate 322. Spring forces 480, 481 are being applied, such as with spring elements 321 (not shown in FIG. 4 but seen in FIGS. 3 and 5), to the plate 322 in a direction that moves or urges the plate 322 and the stack 396 toward the upper housing 330 and the ejection assembly 350 contained therein. Particularly, as shown, the thread/surface 367 of the tire 366 is placed in abutting contact with the upper surface of an uppermost or top sheet/bill 397 of stack 396 at a contact point/area 398, and the friction or capture/grabbing forces between the thread 367 and upper sheet 397.

[0064] Then, rotation 490 of the axle 362 by motor 360 causes the thread/surface 367 to move, which causes the contacted sheet/bill 397 to also move off the stack 396 to be ejected along the bill/sheet path 399 and from housing 310 via outlet/opening 313. The contact point/area 398 moves along the length of the uppermost sheet 397 until it is fully ejected or launched out of the housing 310, and, at this point in operations, the further rotation 490 causes the thread/surface 367 of the rotating wheel to contact/grab a next uppermost sheet and begin to eject/launch it from the housing 310 of apparatus 300.

[0065] FIGS. 4 and 5 are useful for better understanding the general theory of operation of a Rainmaker of the present description. With regard to loading the Rainmaker and bill/sheet feeding to the ejection assembly, the lower half of the Rainmaker or sheet ejecting apparatus is made up of a lower housing 310 and a bill plate (or platform or tray) 322. The bill plate 322 and lower housing 310 are held together by captive springs 321. The lower housing 310 is removed from the upper housing 330 by depressing a tab at the end of the assembly and rotating the lower assembly/housing 310 away from the upper assembly or housing 330. To lead the Rainmaker 300, a stack 396 of bills or media fliers (or other sheets) is placed in the bill tray 322 on contact/receiving surface 332, and the lower housing 310 and now-loaded bill tray 322 is reattached to the upper half/housing 330 of the apparatus 300.

[0066] In the cross section diagram shown in FIG. 4, a stack 396 of bills/sheets is shown between the bill plate 322 and the upper housing lid 352. These bills 396 are held firmly against the upper housing lid 352 and wheels of the ejection assembly 350 by compression springs 321. The force created by the springs is shown in diagrammatic form with arrows 480, 481. In some preferred embodiments, the springs 321 located near the wheel threads/contact surfaces 367 and motor 360 have higher spring force than the springs 321 at the “rear” or opposite end of the apparatus 300. In other words, the spring force 481 is greater (25 to 100 percent or more greater) than the spring force 480 so as to create a more optical pressure or friction at the contact point/area 498 between the uppermost bill 397 of the bill stack 396 and the driving wheels (hub 362 with overlying tire 366) and their threads/contact surfaces 367. The springs 321 providing spring force 480 are selected to provide a weaker compression-based spring force and are used to keep the bill plate 322 and media in stack 396 in alignment with the upper housing lid 352 while minimizing internal friction between bills of stack 396 and upper housing 330 (e.g., not used as much to assist with feeding the sheets to the ejection assembly as the springs 321 that are providing spring/feeder force 481).

[0067] The Rainmaker may be activated by depressing push button switch 336. When the switch 336 is depressed, current from the battery 355 is supplied to the motor 360 and the wheels are driven via rotation of axle 362. The RPM of the motor 360 and the wheel diameter are typically determined or chosen so as to create a velocity within a desired range or at the point/area 398 where the wheels and uppermost bill, sheet, or media meet. This velocity, for example, may be selected to achieve the fastest launching and travel (ejection/launch distance) for a particular sheet of material (e.g., 1 to 3 feet or more). The compression springs 321 maintain at least a desired and useful minimum pressure on the sheets in stack 398 throughout the distribution/launching of a bill stack 398 of up to 50 or more sheets (e.g., whatever the capacity of the cartridge 310).

[0068] The direction of rotation of the motor 360 is shown with arrow 490 in the functional diagram of FIG. 4. The wheels are made up of two different materials. The wheel hub 364 is a denser PVC type material and the wheel surface 367 is a softer material such as a low durometer silicon or similar material with a tread pattern. The wheel surface 367 is preferably designed to “grab” the bills or media fliers (e.g., to provide a higher degree of friction). When the last bill is launched from the Rainmaker unit 300 and the bill plate 322 travels to its maximum height, the wheels fit into slots 328 in the bill plate 322. This allows for greater pressure between the bills and wheels and eliminates drag and wear on wheels and battery after the Rainmaker 300 has launched its last bill.

[0069] Although the invention has been described and illustrated with a certain degree of particularity, it is understood that the present disclosure has been made by way of example, and that numerous changes in the combination and arrangement of parts can be resorted to by those skilled in the art without departing from the spirit and scope of the invention, as hereinafter claimed.

[0070] The Rainmaker has several uses including: (1) payment of cash to exotic dancers in a club or on stage; (2) showing off in a crowd or public place; (3) performers on stage shooting items to a crowd; (4) at a sports stadium to shoot coupons or flyers to the crowd; (5) transactional payment in any setting that takes cash or coupons, for example in a drive through fast food restaurant; (6) at any event where unique marketing would be beneficial by shooting out flyers, business cards, coupons, and so on; and (7) as a board game toy or piece of the game (any game that requires sharing or paying of paper or like money or other paper source).

[0071] Industry interests in the Rainmaker and its uses are also varied and include: (1) the music industry, rappers, singers, producers, and composers; (2) venue owners such as nightclubs, bars, strip clubs, limos, and sporting venues; (3) entertainers such as strippers, go-go dancers, DJs, and musicians; (4) event management and promotion; (5) marketing professionals; (6) cell phone and accessory companies; (7) professional athletes such as NFL, MLB, NBA, NHL, MLS; (8) entertainment industry and those with pop culture interest; and (9) any industry that takes cash as payment.

[0072] The Rainmaker provides a number of advantages over prior devices used to dispense bills. First, the Rainmaker is configurable for shooting bills/sheets in rapid succession so as to produce a visual “rain effect” with the shot or launched bills/sheets. The launched bills may be shot or ejected from
the Device in a manner that facilitates creation of a “rain effect.” This may be created/defined by, for example, a particular ejection speed, particular feeding mechanism (i.e., the component that transfers bills from the cartridge to the ejection site), or a particular storage configuration in the cartridge. Shooting bills in a rapid succession so as to produce a “rain effect” differs from prior devices because these other devices would not be useful for creating such an effect. Rather, many of the prior dispensing devices release bills in a manner such that the bills may be received by a tray or drum. Carefully dispensing bills in this manner to be received by a tray or drum requires ejection speeds, feeding mechanisms, and storage configurations that are much different and distinguishable from that of the Rainmaker.

Second, the Rainmaker may include control mechanisms that cause a random/variable number of bills to be ejected from the Rainmaker. The Rainmaker may, for example, have a control switch that initiates bill ejection, whereby the number of bills ejected may vary with the operation of the control switch. For example, activating the control switch for 3 seconds may, in a first instance, cause 20 bills to be ejected. Yet, in a second instance, activating the control switch for 3 seconds may cause 18 bills to be ejected. The prior dispensers teach only a predefined and highly accurate counting device, which controls the amount of bills output from a given device such as an ATM. The bill dispensing and insertion systems require a high degree of accuracy to facilitate monetary transactions. In contrast, the visual effect product by the Rainmaker may not require the same accuracy but can be provided with such accuracy if desired.

Third, the Rainmaker is a portable, internally powered device. The Rainmaker can be designed specifically to be battery operated and to be slim enough to fit in a user’s pocket. The Rainmaker may use compact and/or self-contained components modified to facilitate the portability of the Rainmaker. In contrast, prior devices are associated with highly complex and immobile machinery, which are not operable by a compact battery. As such, the properties of the electromechanical components of the Rainmaker likely materially differ from ATMs and similar devices.

Fourth, the Rainmaker may be configured for producing a sound effect associated with the rapid ejection of bills. The Rainmaker, for example, may produce a sound associated with the rapid ejection of bills. This may include a sound which alters depending on the amount of bills ejected or by other user controls (e.g., a user may select a sound effect from a list of available sounds). Further, the sound may be related to, or coordinated to coincide with, the visual “rain effect” produced by the ejected bills. Prior devices are not adapted to not produce a sound associated with the ejection of bills let alone one associated with the visual appearance of a “rain effect.”

Fifth, the Rainmaker may be configured for controlling via an external mobile device (e.g., a smart phone). For example, the Rainmaker can be controlled via a software application that runs on a mobile device, such as a smart phone, which is in communication with the Rainmaker (e.g., via a wireless communication network). The controlling application may activate the Rainmaker and integrate the Rainmaker with an external network. The prior dispensing devices do not use a control mechanism operable on a mobile platform. Moreover, these devices do not include a mechanism of remotely controlling a bill ejection system in any regard as these devices are all controlled at the device itself.

Although not shown in the figures, the top cover or upper housing (or lower housing, in some cases) will include components to provide the control or operations functions described herein. For example, one or more printed circuit boards (PCBs) may be provided in the Rainmaker to provide one or more processors that execute code/programs stored in memory on the PCB(s) to control the operations of the Rainmaker. Further, the memory may be used to store operating parameters such as discharge rate and discharge quantity, each of which may be default values or values set based on user input. These parameters may be retrieved by a control program run by the processor(s) of the PCB(s) to send control signals to the drive motor. Further, the control program may include a counter routine to determine the number of sheets dispensed (and/or remaining in the cartridge) from the apparatus, and the control program may display this number via a counter display. In other cases, a GUI generation module/program may be provided in the memory that is operable by the control program to generate a GUI that is displayed on a screen/monitor/touch screen on the Rainmaker housing or an exterior surface of the apparatus.

Following is a general description of the future circuit board, battery and enhanced functions of one exemplary implementation of a Rainmaker product as proposed by the inventor. The Rainmaker may use three lithium ion batteries to achieve a voltage of 9 or more Volts. These batteries can each have an individual capacity of 1000 to 1700 mAh. The batteries also can be thin flat cells and are located on top of the internal bill plate.

Further, the Rainmaker may contain a PBCA or PCBA located on the interior top of the upper housing. The PCBA location allows for connection of user interface control switches and indicators to be accessed through the top of the upper housing minimizing assembly labor and cost and simplifying accessibility of user interface controls and readouts. The PCBA can be adapted to contain electronic circuits that perform the following functions: (1) Battery charging functions including: (a) The battery can be charged through a micro USB connector located on the edge of the PCBA and protruding through the device enclosure; and (b) The charging function can be controlled via a charging regulation circuit allow batteries to charge at 1000 mA and reduce charge to safe levels as battery charge level increases and battery temperature allows; (2) Battery charge indication (e.g., an indicator could change status to indicate status charging is complete); (3) The PCBA may also include a microprocessor that monitors and controls the following functions of the Rainmaker user interface: (4) User switched “incident” “decrement” and “start”; (5) User indicators “Count” “Rain Quantity” and “Rain Rate”; (6) Depressing the “incident” and “decrement” button simultaneously allows user to select parameter Count, Rain Quantity and Rain Rate for modification; and (7) Microprocessor and associated circuitry including ESD protection, voltage regulation, clock, A/D and I/O digital interfaces: (a) the microprocessor can control and communicate with all I/O switches and indicators on the user interface portion of the rainmaker through digital I/O pins on the microprocessor and (b) an optical or mechanical sensor paired with analog circuits will connect to an analog-to-digital input on the microprocessor (e.g., this input can be analyzed through embedded micro code and establish a method for counting bills as they are ejected from the rainmaker device).
The board or PCBA may contain motor control circuitry for start, stop, and breaking of the motor motion. This may be microprocessor controlled through algorithms contained in the micro embedded code. The user interface controls may also be designed to set the parameters for these operations. Inputs from user interface switches allows user to set the number of bills to be launched or ejected from the device. When the user activated the device, the microprocessor may be configured activate the motor ejecting bills until the desired number is reached.

At this point, the microprocessor can function to stop or “brake” the motor. The bill count display can then decrement as the bills are ejected from the display. After the user defined number of bills is ejected, the bill count may display the number of bills remaining in the bill tray. The microprocessor can then interface with a “Rain Rate” control switched to allow user to increase or decrease the rate in which bills are ejected from the device. The user interface controls will allow the user to increment or decrement the number of bills displayed in the user interface “counter” display. At the time of loading the bill tray, the user can also adjust the bill count display to match the total number of bills loaded into the device.

With regard to the motor and wheel, the motor rotates at approximately 9,000 RPM in some implementations (e.g., within a range of about 7,000 to 11,000 RPM). The wheel hub in these implementations may be in the range of about 15 to 25 mm (e.g., 20 mm) in diameter. The wheel outside diameter including the soft durometer material can then be in the range of 20 to 30 mm (e.g., 25 mm) in diameter.

1. An apparatus for launching sheets of material into the air, comprising:
   - an upper housing;
   - a lower housing detachably coupled to the upper housing;
   - a feed assembly, mounted to an interior space of the lower housing, comprising a plate with a planar upper surface for receiving a plurality of the sheets and at least one spring element applying a spring force upon the plate to urge the planar upper surface toward the upper housing; and
   - an ejection assembly, supported within an interior space of the upper housing, adapted to sequentially eject the sheets from an opening in the upper housing.

2. The apparatus of claim 1, wherein the feed assembly comprises at least four of the spring elements each applying a separate spring force to the plate with a first pair of the spring elements positioned proximate to the opening and a second pair of the spring elements positioned distal to the opening.

3. The apparatus of claim 2, wherein the spring elements comprise compression springs and wherein the spring forces applied by the first pair of the spring elements is greater than the spring forces applied by the second pair of the spring elements.

4. The apparatus of claim 1, wherein the ejection assembly comprises an electric motor and a battery selectively powering the electric motor, wherein the electric motor rotates an axle when powered by the battery, wherein a pair of spaced apart wheels are provided on the axle to rotate with the axle, and wherein the wheels extend toward the plate of the feed mechanism to contact an uppermost one of the sheets and to move the uppermost one of the sheets toward the opening when the wheels are rotating.

5. The apparatus of claim 4, wherein the motor rotates the axle and the attached wheels at a rotation rate whereby the uppermost one of the sheets is ejected a distance of at least 1 foot.

6. The apparatus of claim 5, wherein the sheets each comprise one of paper money, a paper or plastic coupon, a flexible flier, and a paper card.

7. The apparatus of claim 4, wherein each of the wheels comprises a tire formed of low durometer material for contacting the uppermost one of the sheets.

8. The apparatus of claim 6, wherein the low durometer material comprises a rubber or a plastic with a durometer rating of less than about A-27.

9. The apparatus of claim 1, wherein the ejection assembly further comprises an activation button accessible via an outer surface of the upper housing and wherein, when the activation button is move from a first to a second position, the electric motor is powered by the battery to rotate the axle with the attached wheels.

10. An apparatus for launching sheets such as paper money, coupons, and informational fliers, comprising:
    - a feed assembly comprising a plate with a planar upper surface for receiving a plurality of the sheets; and
    - an ejection assembly adapted to sequentially launch the sheets off of the planar upper surface, wherein the ejection assembly comprises an electric motor and a battery selectively powering the electric motor, wherein the electric motor rotates an axle when powered by the battery, wherein a pair of spaced apart wheels are provided on the axle to rotate with the axle, and wherein the wheels extend toward the plate of the feed mechanism to contact an uppermost one of the sheets and to move the uppermost one of the sheets off of the planar upper surface of the plate when the wheels are rotating.

11. The apparatus of claim 10, wherein the motor rotates the axle and the attached wheels at a rotation rate whereby the uppermost one of the sheets is ejected a distance of at least 1 foot.

12. The apparatus of claim 11, wherein the sheets each comprise one of paper money, a paper or plastic coupon, a flexible flier, and a paper card.

13. The apparatus of claim 10, wherein each of the wheels comprises a tire formed of low durometer material for contacting the uppermost one of the sheets.

14. The apparatus of claim 13, wherein the low durometer material comprises a rubber or a plastic with a durometer rating of less than about A-27.
an upper housing;
a lower housing detachably coupled to the upper housing;
a feed assembly, mounted to an interior space of the lower
housing, comprising a plate with a planar upper surface
for receiving a plurality of the sheets and at least one
spring element applying a spring force upon the plate to
urge the planar upper surface toward the upper housing;
an ejection assembly, supported within an interior space of
the upper housing, adapted to sequentially eject a num-
ber of the sheets from an opening in the upper housing or
the lower housing, wherein the number is selected based
on user input or is a quantity selected by a controller of
the ejection assembly from a plurality of discharge
quantities in a random manner.

18. The apparatus of claim 17, wherein the user input
comprises operating an activation button to provide power to
an electric motor rotating one or more wheels contacting the
sheets on the plate.

19. The apparatus of claim 17, wherein the user input
comprises input defining a maximum quantity of the sheets
for ejection during an operation session.

20. The apparatus of claim 17, wherein the ejection assem-
bly comprises a user interface for receiving user input defining
an ejection rate controlling a rate of ejection of the sheets
by the ejection assembly and wherein the ejection assembly
further comprises a display displaying a count of a number of
the sheets ejected from the opening.

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