Disclosed is a rubber band dispenser suitable for use in homes, offices and industrial settings which is capable of repeatedly dispensing single rubber bands from a multiplicity of rubber bands. A version is disclosed in which a queue of rubber bands is continually pressed against a flange by means of a spring mechanism or the force of a weight with one or more gaps in an outer housing placed over the core of rubber bands. A guide may be used in the areas of the gap to urge distortion of one or more sections of the rubber band and cause it to form a graspable portion. In another variation, a mechanical ejector is actuated by the user to push against one rubber band, causing it to flex and form a graspable portion protruding from an orifice in a housing. Actuation may be by direct mechanical linkage to an operator-moved element, or by an electric powered actuator. Sequential queuing of rubber bands may be accomplished by means of a spring mechanism or using a weight.
RUBBER BAND DISPENSER

REFERENCE TO PRIOR FILED APPLICATIONS

[0001] None.

GOVERNMENT LICENSE RIGHTS

[0002] None.

FIELD OF THE INVENTION

[0003] The present invention relates to a new device for storing and conveniently dispensing individual elastic bands, especially rubber bands.

BACKGROUND

[0004] Rubber bands are widely used for office, industrial and household needs. They are available in a variety of sizes and are generally sold in boxes or bags. As is commonly experienced, rubber bands tend to accumulate in drawers, snagging on other items such as pens and paperclips. It is also a common experience that it is difficult to remove a single rubber band from a container, as typically several come out at the same time and the excess must be returned to the container.

[0005] Other goods in the same general class such as paper clips and staples have been the subject of inventions to make dispensing more convenient. However, heretofore, little has been developed to help store and dispense the ubiquitous rubber band.

[0006] U.S. Patent No. 3,001,349 issued to Hoag discloses an apparatus for packaging a plurality of rubber bands on a card. This invention lacks a means for dispensing them from the packaging, however.

[0007] U.S. Patent No. 5,037,000 issued to Salame and related design patent Des. 326,612 disclose a container for dispensing rubber bands. The container is merely a hinged box with a hole in the top for grasping rubber bands held inside. There is no provision for keeping the rubber bands organized and unjumbled.

[0008] U.S. Patent No. 5,909,809 issued to Franklin discloses a rubber band holding device generally described as a cubic body having rounded slots, or a mushroom shape or apple core shape to hold a plurality of rubber bands. This invention also lacks a convenient means to dispense the rubber bands.

[0009] U.S. Patent No. 7,037,314 issued to Armstrong discloses a medical device for ligation of hemorrhoids. This device is intended to allow a doctor to grasp hemorrhoidal tissue or suction it into the central cavity of the device and place a rubber band around it. This device would not be usable in the office or home environment to store and dispense rubber bands and is very expensive to manufacture. Nor does this device allow for a user to easily grasp a single rubber band for use other than treating hemorrhoids.

[0010] U.S. Patent No. 7,353,968 issued to Cotslas discloses a dispenser for rubber bands consisting of a pair of nesting bowls and an aperture in the upper bowl. Rubber bands are placed in a jumble between the bowls. To obtain a single rubber band, one reaches through the aperture and grasps one, hopefully not dragging several out at the same time. This invention does not allow for dispensing a single rubber band at a time, but rather allows the user to reach into a multiplicity of rubber bands and grasp one out of the jumble.


[0012] Thus there is a need for a device, suitable for use in an office, home or industrial setting for holding a multiplicity of rubber bands and conveniently dispensing one at a time.

[0013] It is therefore an object of this invention to provide a rubber band dispenser that dispenses a single rubber band at a time.

[0014] It is a further object of the present invention to provide an aesthetically-pleasing desk top device for holding and dispensing rubber bands.

[0015] It is a further object of the present invention to provide a rubber band dispenser with a surface to display advertising or other information.

SUMMARY

[0016] To fulfill the above objects, we hereby disclose a novel rubber band dispensing apparatus. Several variations are described including a spring-actuated dispenser, a manually operated lever actuated dispenser, a gravity-fed dispenser and an electrically-operated lever actuated dispenser. A cassette type refill containing a multiplicity of rubber bands for dispensing is also disclosed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. 1a is a perspective view of a spring-actuated embodiment of the present invention.

[0018] FIG. 1b is a perspective view of the first embodiment showing partial disassembly.

[0019] FIG. 1c is a cross section of the first embodiment of the present invention.

[0020] FIG. 2a is a perspective view of a second embodiment of the present invention in the stand-by position.

[0021] FIG. 2b is a perspective view of the second embodiment in the depressed, dispensing position.

[0022] FIG. 2c is a partly exploded view of the second embodiment.

[0023] FIG. 2d is a cutaway view of the second embodiment.

[0024] FIG. 2e is an exploded view of the second embodiment.

[0025] FIG. 2f is a cross sectional view of the second embodiment.

[0026] FIG. 3a is a perspective view of an electrically-operated embodiment.

[0027] FIG. 3b is a partially exploded view of an electrically-operated embodiment.

[0028] FIG. 4a is a cross sectional view of an alternative embodiment using an ejection mechanism.

[0029] FIG. 4b is a perspective view of the alternative embodiment using an ejection mechanism.

[0030] FIG. 5 is a cross sectional view of a gravity-fed ejection-type embodiment of the present invention.

[0031] FIG. 6 is a perspective view of one example of an armature type core to hold the stacked queue of rubber bands.

[0032] FIG. 7 is a perspective view with cutaway showing a refill of stacked queue of rubber bands covered with removable shrink wrap plastic inserted over an optional core.

[0033] FIG. 8 is a perspective view of a multi-unit assembly.
The present invention utilizes mechanical means to dispense a single rubber band from a queue of stacked rubber bands. A clear understanding of the design and operation of various embodiments of the present invention may be obtained from the accompanying figures described below.

FIGS. 1a, 1b and 1c illustrate a first embodiment of a rubber band dispenser 110 which is spring-actuated. This embodiment does not require a lever mechanism or mechanical operation by the user to feed individual rubber bands. Here, a core 112 containing a multiplicity of rubber bands 114 organized in a queue is inserted over an inner mechanism 116 containing a rubber band pusher 118a and spring 118b assembly. This spring-pusher assembly exerts continuous upward force on the queue of rubber bands 114, pushing them upward to the top of the core 112 thus sequencing them for dispensing. A housing 120 is inserted over the stacked queue of rubber bands 114 holding them down against the force of the spring-pusher mechanism 118a and 118b. The coefficient of friction of the core 112 surface is necessarily low enough and to allow the rubber bands to slide upward in response to the force in response to the force exerted by the spring-pusher mechanism 118a and 118b.

The stacked queue of top rubber bands 114 is stopped in its upward movement when the top-most rubber band contacts two flanges 126. However, the ends of the rubber band are not constrained by the flanges 126 because there are gaps in the flange and are free to extend upward out of the housing 120. To further direct the distortion of the rubber band to form a graspable portion, the internal guideway 127b of the housing 120 is formed with a slight indentation configuration 127b at the exit point causing the top rubber band to flex and thus protrude at the ends 128. Thus, a single rubber band may be extracted by grasping the protruding portion 128 further allowing the spring mechanism 118 to push the next rubber band in the cue into the extraction position.

It should be further noted that the upward sequencing pressure against the rubber band stack provided by the spring-pusher mechanism 118b and 118a shown using coil springs 118b in the foregoing discussion may alternately be provided by a wide variety of mechanisms well-known in the mechanical arts. Without limitation, these include compressible foam, compressible elastomer, gas-filled pistons, or leaf springs. Additionally, the protrusion 127b provided at the exit of the housing may take a wide variety of forms, each able to cause distortion of the exiting rubber band 128 to make it graspable. These may include a separate piece or an integral part of the housing (as shown here). It may be a slot, a wedge, a cylinder, or any other shape suitable to make distort and/or guide the exiting rubber band. The core 112 holding the queue of rubber bands 114 may be a disposable cassette unit pre-loaded with rubber bands, or may be refillable by the user, in which case the core 112 itself may either be removable or a fixed component of the dispenser mechanism. Interchangeable cassette-type cores 112 holding different sizes of rubber bands 114 may also be used.

FIGS. 2a-2e illustrate a manually-operated mechanically actuated version of the present invention. FIG. 2a shows the rubber band dispenser 202 in the stand-by position. FIG. 2b shows it in the depressed, dispensing position in which a graspable portion 210 of a single rubber band is erupted from the dispenser due to its distortion forced by the mechanism.
continuous pressure on the queue of rubber bands 325 so that the top most rubber band is pressed against the inner lip of the outer housing 336 surrounding the dispensing orifice 338. When the rubber band pusher presses on the top most rubber band, the rubber band flexes and the center part protrudes out of the dispensing orifice 338.

[0044] The electric actuator may take the form of a solenoid, motor or any similar device. An external power source may be substituted for the batteries. The batteries may be rechargeable or disposable. Any electrical storage device such as a fuel cell, capacitor or similar device may also be used in addition or in the alternative. Photovoltaic recharging may also be employed.

[0045] FIG. 4a is a cross sectional view of an alternative embodiment using an ejection mechanism. This alternative differs from the foregoing embodiments in that it does not rely on distorting a rubber band to create a grasping portion. Here, a stacked queue of rubber bands 410 is disposed around a core 412 inside a housing 416. A spring mechanism 420 moves the stack of rubber bands upward until they are stopped by the inner surface 422 of the housing 416. If used, the core 412 is configured to permit the stack of rubber bands 410 to extend past the top of the core 412 by approximately the width of a single rubber band. An aperture 426 is provided in the side of the housing 416 aligned with the top most rubber band 428 in the stack 410. A plunger 430 is configured to push the top most (first) rubber band 420 and separate it from the stacked queue of rubber bands 410, pushing it through the aperture 426 where it may be grasped by the user.

[0046] FIG. 4b is a perspective view of the alternative embodiment using an ejection mechanism. It may be seen that, in this embodiment, the housing may be opened to insert a stacked queue of rubber bands 410 over the core 412 by removing the top portion 434 of the housing 416 from the bottom portion 436 of the housing after pressing release tabs 440 on each side of the housing 416 and pulling the two halves apart. In this way, pre-packaged stacks of rubber bands 410 may be conveniently inserted.

[0047] FIG. 5 is a cross sectional view of a gravity-fed embodiment of an ejection type embodiment of the present invention. Here, as in the prior embodiments, a stacked queue of rubber bands 504 is disposed around a core 506 and enclosed in a housing 508. A dispensing orifice 510 in the housing is located aligned with the bottom-most rubber band 512 in the stacked queue 504. A plunger 514 is configured to push the bottom-most rubber band 512 out of the orifice 510. To keep the stacked queue of rubber bands 504 pushed downward when the bottom-most rubber band 512 is dispensed, sequencing the next rubber band into position for dispensing, a weight 518 is disposed on top of the stacked queue of rubber bands, around the core 506. The weight 518 is free to slide down the core 506 as successive rubber bands are removed through the dispensing orifice 510. Since the weight 518 will tend to make the device top-heavy, a wide base 522 should be employed to provide stability. As in previously-described embodiments, a refill of a stack of rubber bands may be slid off a temporary core onto the dispensing core 506 built into the device, or the dispensing core 506 may be a replaceable part provided with the refill (not shown in this view). The rubber bands 504 and then the weight 518 are inserted into the top of the device after removing the top cover 526, which is then replaced after the unit is refilled.

[0048] The weight substituting for a spring may also be employed in a rubber band distorting device similar to those described in FIGS. 1a and 1b by adding a distorting indentation or similar structure causing a portion of the bottom-most rubber band 512 to protrude through the dispensing orifice 510. In such a device a plunger 514 would not be required. Thus, it may be seen that the same approach using a weight to gravity-feed the rubber bands may substitute for a spring mechanism.

[0049] FIG. 6 is a perspective view of one example of an armature type core 600 to hold the stacked queue of rubber bands. It will be seen that this element of the present invention may be applicable to each of the foregoing embodiments as they all may employ a core to hold a stacked queue of rubber bands. While a solid surface tube may be used as a core, it may be advantageous to create an armature type core as shown here, employing pin type structures 604 for at least a portion of the length of the core 600. Use of pins 604 not only reduces material used in fabrication, it may allow for reduced friction to facilitate better movement of rubber bands along their length. Cores such as this may be made as a permanent part of the dispenser mechanism or disposable as part of a rubber band cassette refill.

[0050] FIG. 7 is a perspective view with cutaway showing a refill 700 of stacked queue of rubber bands 710 covered with removable shrink wrap plastic 711 and inserted over an optional core 712. The shrink wrap packaging material may be perforated 713 to facilitate removal for insertion into a dispenser device. If a core 712 is used in the refill, as shown in this view, it may be removed for insertion into a dispenser, or may function as the core inside the dispenser. Typically, in this example, the entire core-rubber band assembly 700 would be pushed onto the dispenser mechanism's built-in core (not shown in this view), pushing the temporary core 712 out of the stack of rubber bands. The shrink wrap material is removed either before insertion of the stack into the dispenser, or after insertion. Alternatively, the rubber band refill may be provided without any core at all, the rubber bands 610 held together by the shrink wrap package material 711. Additionally, or in the alternative, small nibs connecting each rubber band 710 with its adjacent rubber band may be left or added during manufacture, temporarily holding them in an organized stack until they are detached when dispensed. Other forms of temporary connections between adjacent rubber bands such as adhesive, hot-melt glue, ultrasonic spot welds or the like may also be used to temporarily hold adjacent rubber bands together in a queued stack. The strength of the connections between adjacent rubber bands must be high enough to keep them together for handling, insertion and sequencing, but weak enough to easily break during dispensing. A wide variety of alternatives is well known to those skilled in the art.

[0051] FIG. 8 is a perspective view of a multi-unit assembly. Here, it may be seen that multiple size rubber bands may be loaded, each in a different dispenser, allowing the user to choose from a variety such as “narrow, medium and wide.” The individual dispensers 802 may be held in a common base 810 for placement in a convenient location, but removed from the base 810 for reloading or individual use. As is applicable to any of the foregoing embodiments, messages 814 or decorative artwork may be placed on the exterior of the dispensers.

[0052] The specific implementations disclosed above are by way of example and for enabling persons skilled in the art to implement the invention only. We have made every effort to describe all the embodiments we have foreseen. There may be embodiments that are unforeseeable or which are insubstan-
tially different. We have further made every effort to describe
the invention, including the best mode of practicing it. Any
omission of any variation of the invention disclosed is not
intended to dedicate such variation to the public, and all
unforeseen or insubstantial variations are intended to be cov-
ered by the claims appended hereto. Accordingly, the inven-
tion is not to be limited except by the appended claims and
legal equivalents.

1. A rubber band dispenser apparatus comprising an actua-
tor means for ejecting one and only one rubber band at a time
from a cassette of rubber bands.

2. The apparatus recited in claim 1 further comprising
detachable interconnections between adjacent rubber bands
in said cassette, a dispense sequencing means and a rubber
band flexing means.

3. The apparatus of claim Error! Reference source not
found. wherein said flexing means comprises a rubber band
pushing member.

4. The apparatus of claim Error! Reference source not
found. further comprising a rubber band stacked queue push-
ing means.

5. The apparatus of claim 2 wherein said flexing means
urges the formation of a graspable portion in one and only one
rubber band in said cassette of rubber bands.

6. A rubber band dispenser comprising a queue of rubber
bands, a pusher mechanism to exert pressure against said
queue of rubber bands to keep them continuously pressed
against a flange, said flange having at least one gap to facil-
itate the flexing out of a single rubber band from said queue of
rubber bands.

7. The rubber band dispenser of claim 6 further comprising
a core to hold said queue of rubber bands.

8. The rubber band dispenser of claim 6 wherein said at
least one gap in the band dispenser housing further comprises
a rubber band distorting configuration in the rubber band
guideway of said housing.

9. (canceled)

10. (canceled)

11. (canceled)

12. (canceled)

13. A cassette of rubber bands comprising a multiplicity of
individual rubber bands pre-arranged in sequence for dis-
pering one and only one at a time.

14. The stacked queue of rubber bands of claim 13 further
comprising a core disposed within said stacked queue of
rubber bands.

15. The stacked queue of rubber bands of claim 13 further
comprising a removable external package disposed around
said rubber bands.

16. The cassette of rubber bands of claim 13 further com-
prising releasable interconnections between adjacent indi-
vidual rubber bands in said cassette.

17. A prearranged sequence of individual rubber bands
arranged in a generally tubular stack conducive for mechani-
cally dispensing one and only one said rubber band at a time.

* * * * *