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(54) **WORD PUZZLE ASSEMBLY AND METHODS RELATED THERETO**

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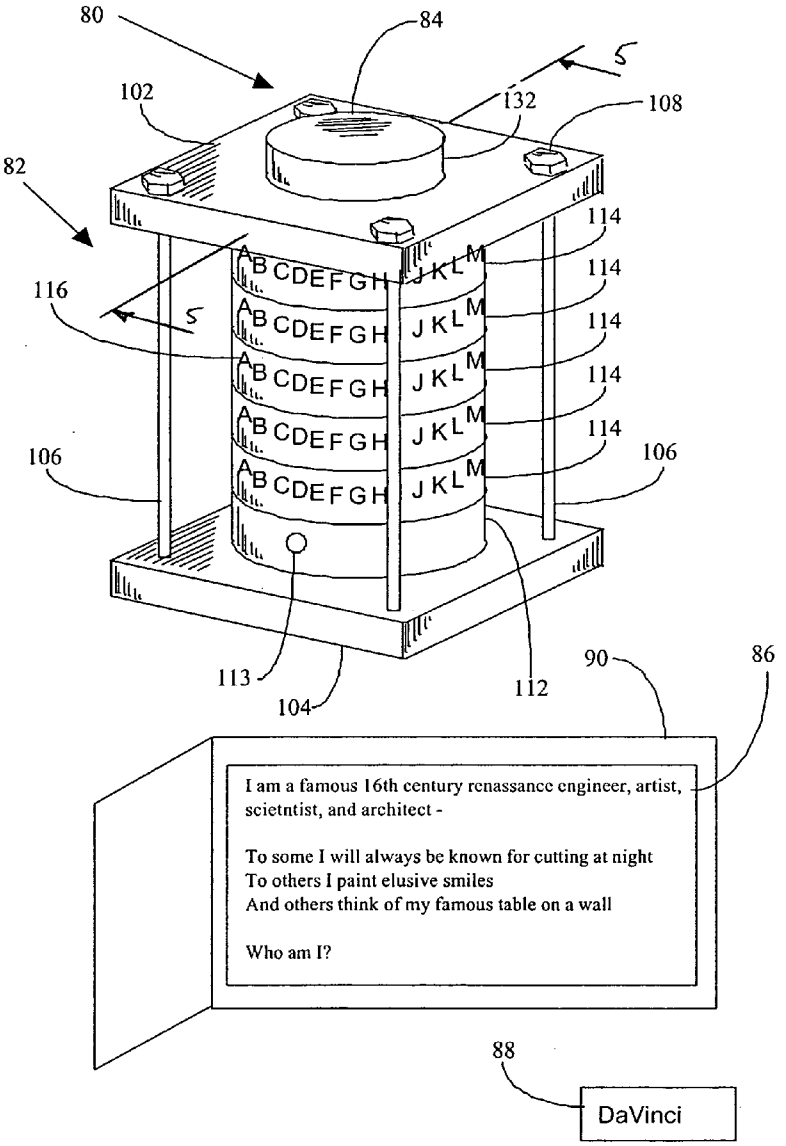
(57) **ABSTRACT**

An apparatus and related methods for providing a locking mechanism wherein tumblers are used to indicate an answer word to a word puzzle or the like, the mechanism including a retainer to retain either a message or an item that is obtainable when the locking mechanism is unlocked, the tumblers adjustable to modify the code in at least some embodiments.



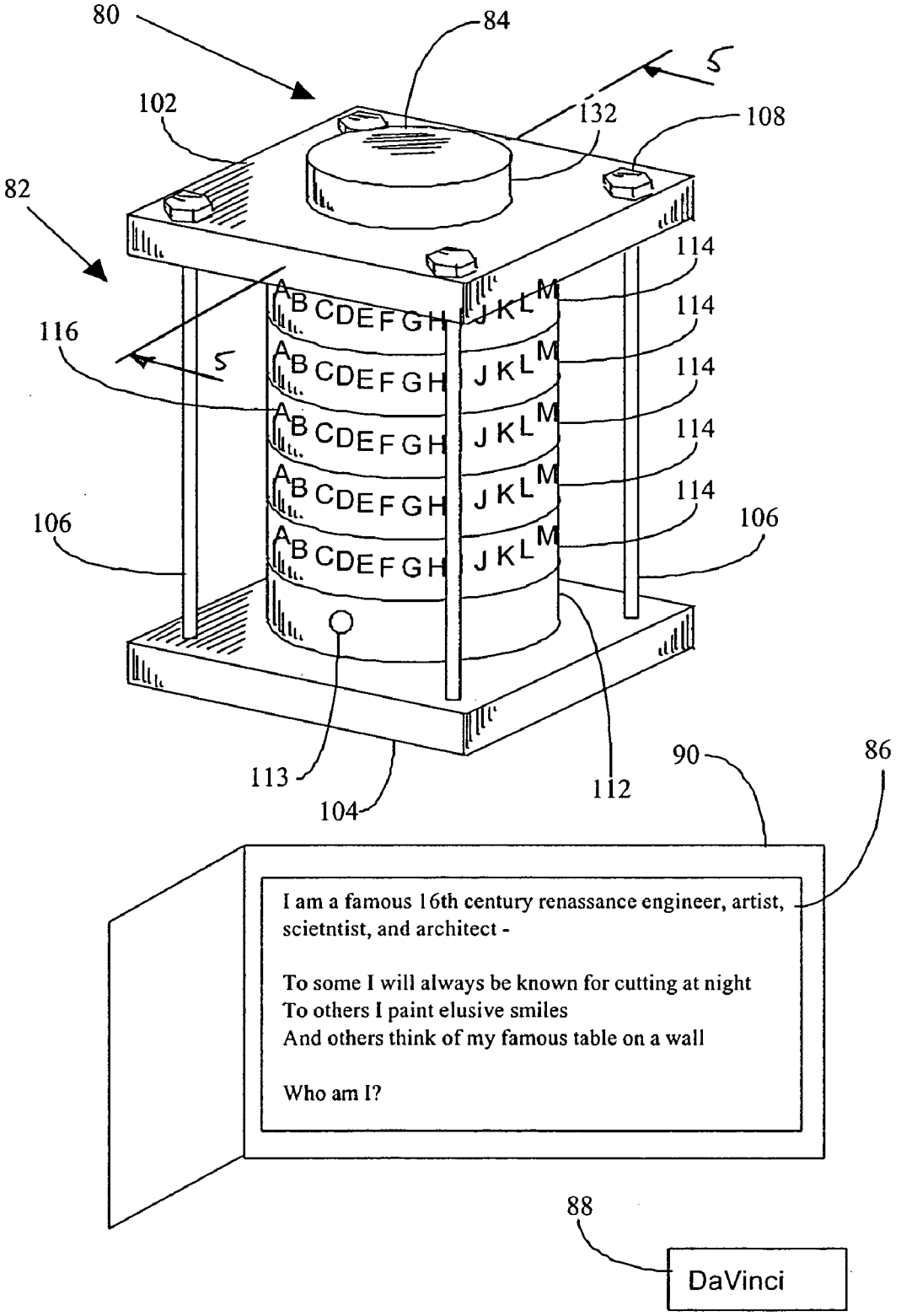
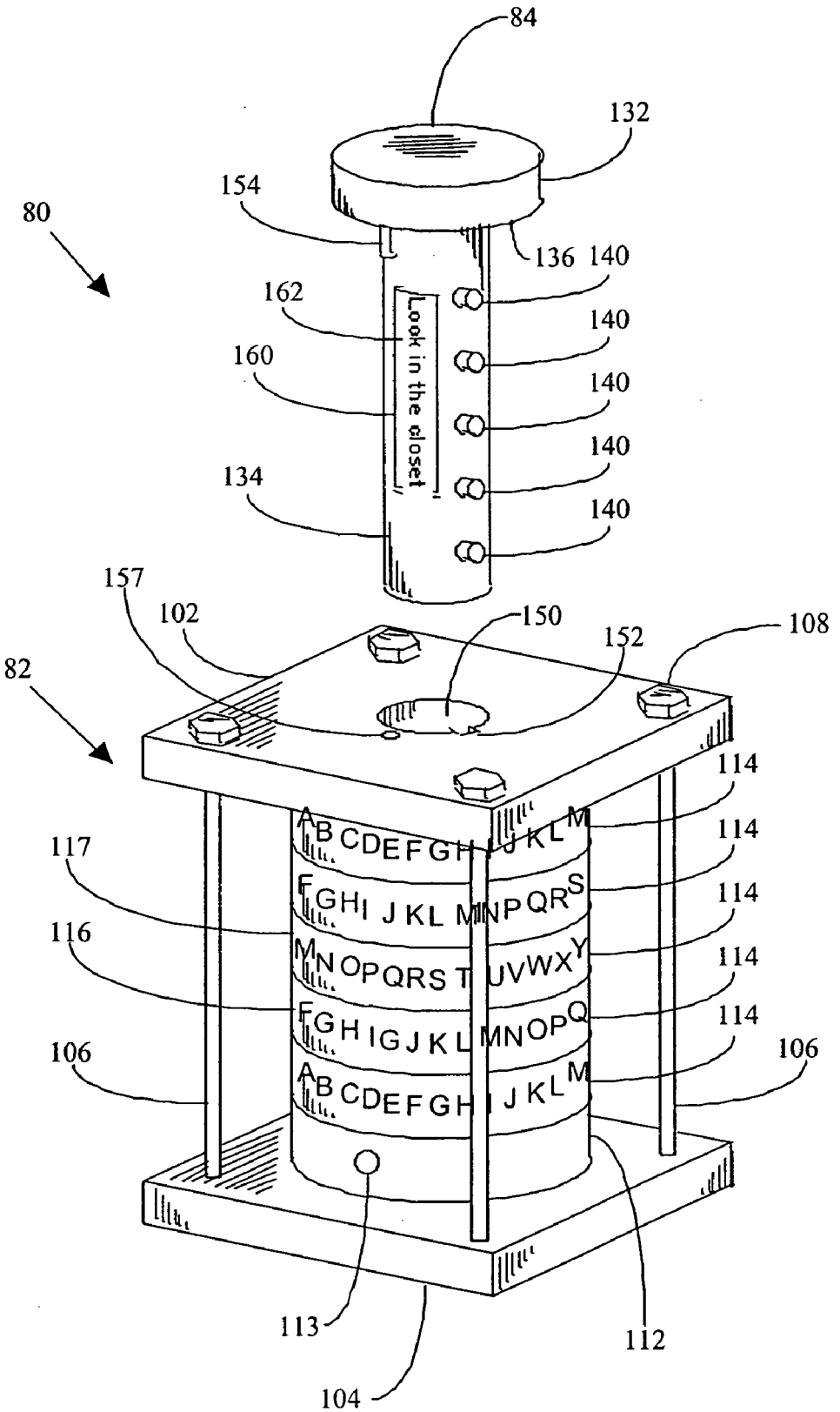

80
84
5
102
132
108
82
114
116
5
A B C D E F G H J K L M
106
106
113
104
112
90
86
I am a famous 16th century renassance engineer, artist, scietntist, and architect -
To some I will always be known for cutting at night
To others I paint elusive smiles
And others think of my famous table on a wall
Who am I?
88
DaVinci

Fig. 1


84
132
154
80
136
140
162
Look in the closet
140
160
140
140
134
140
157
102
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152
108
82
114
117
114
114
116
114
114
106
106
113
112
104

Fig. 2

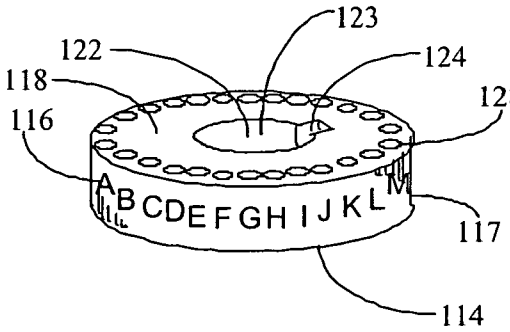


Fig. 3

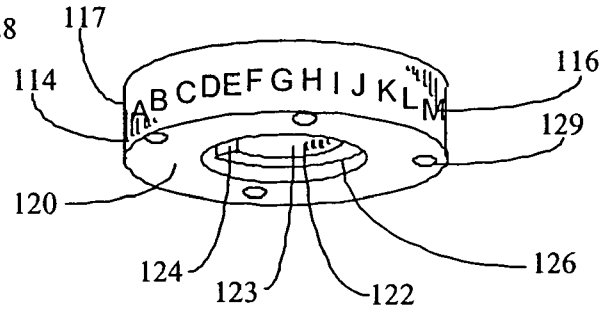


Fig. 4

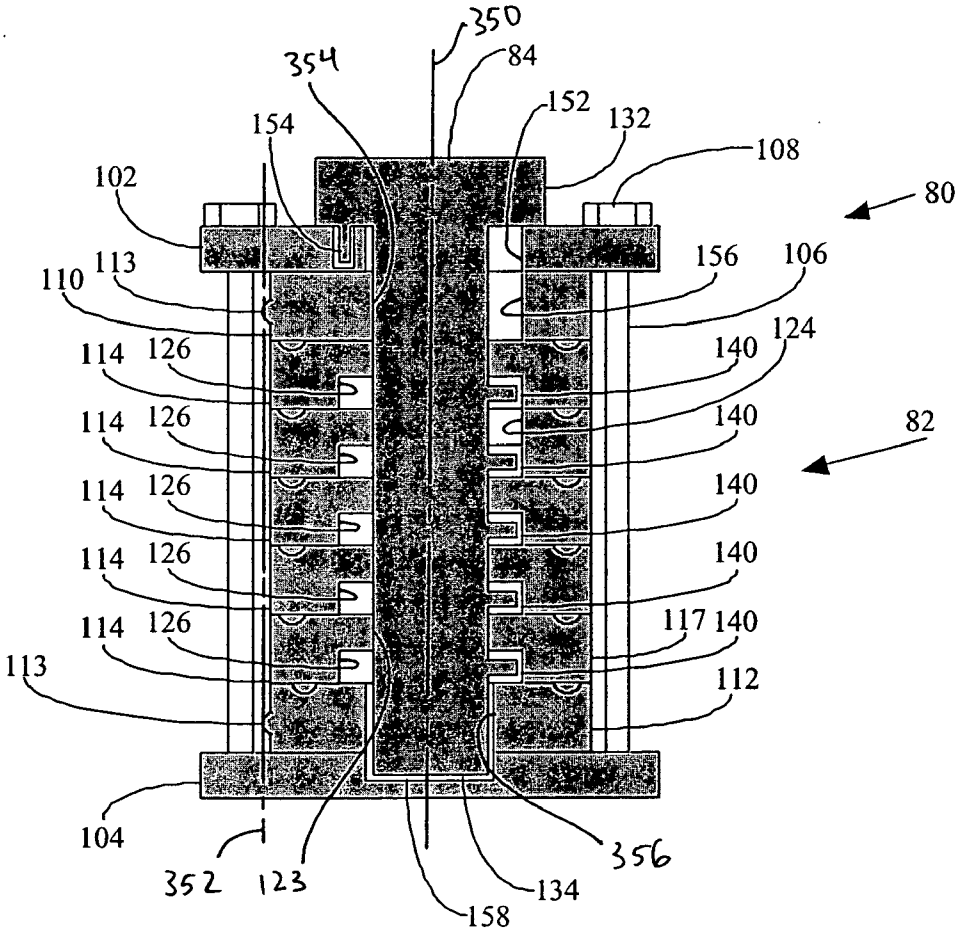
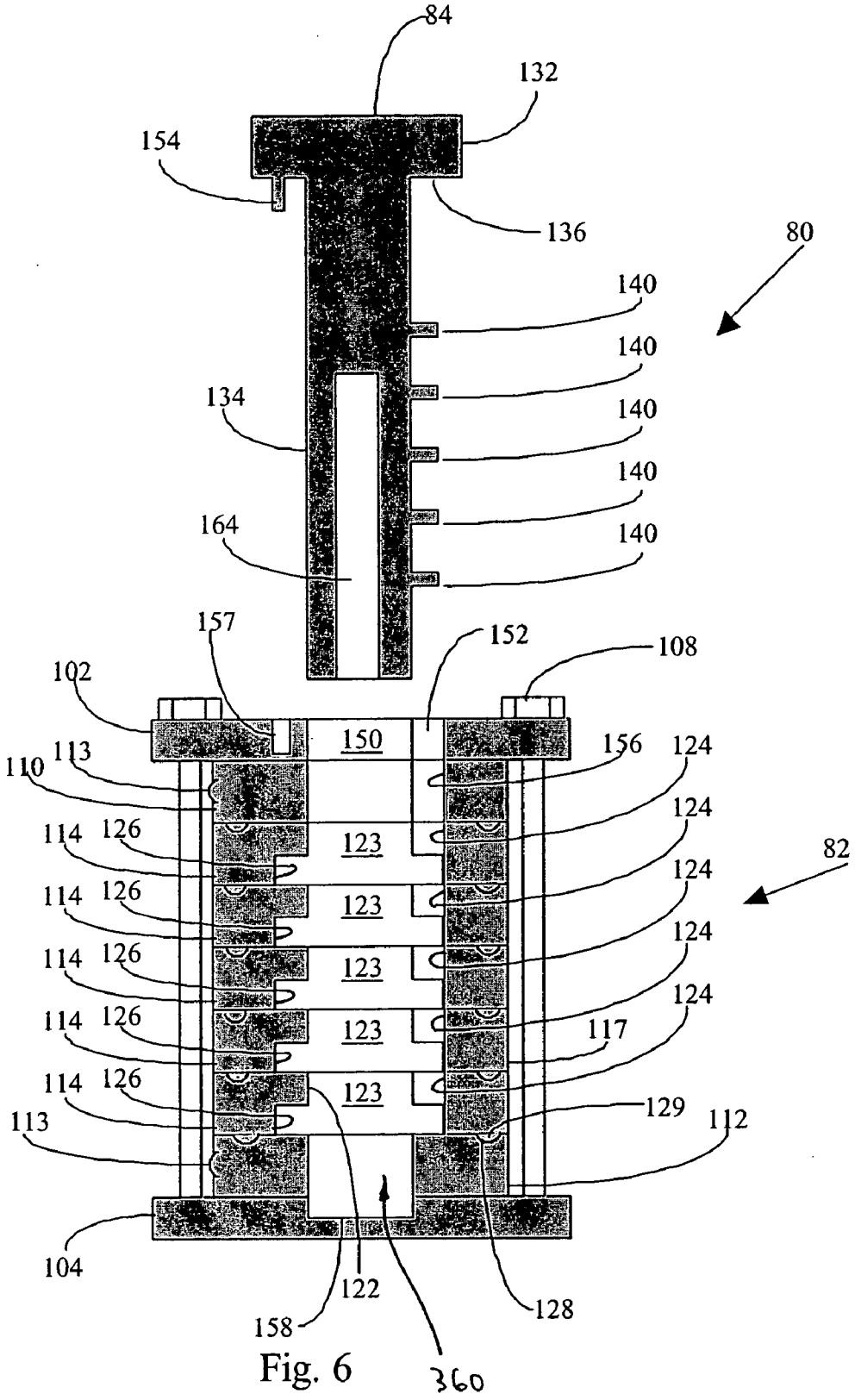


Fig. 5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132
154
136
80
140
140
140
140
140
134
164
157
152
108
102
150
156
124
110
113
124
114
126
123
82
124
114
126
123
124
114
126
123
124
114
126
123
124
117
114
126
123
129
113
112
104
122
128
158
360

Fig. 6

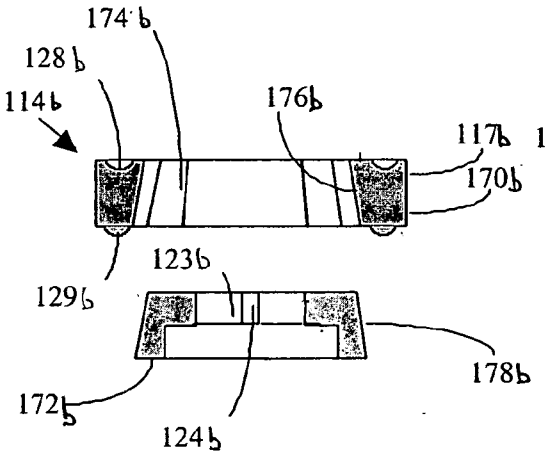


Fig. 7

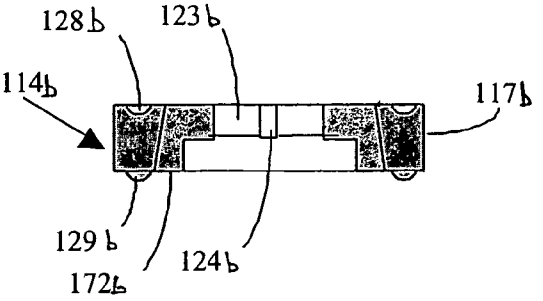


Fig. 8

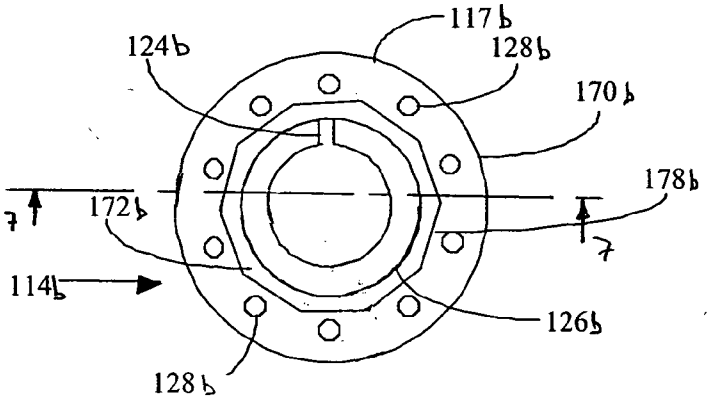


Fig. 9

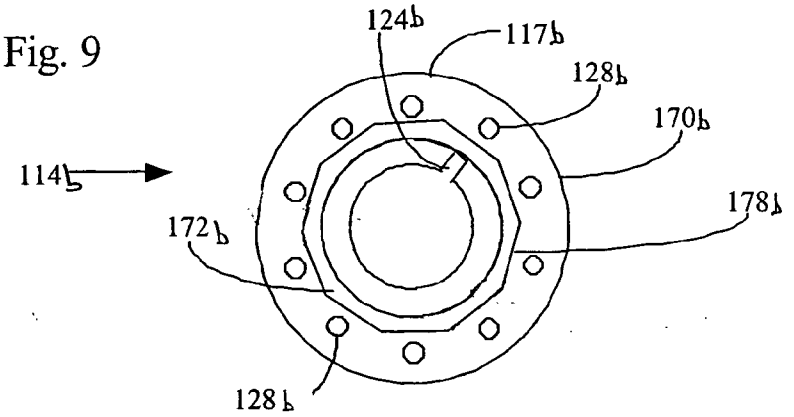


Fig. 10

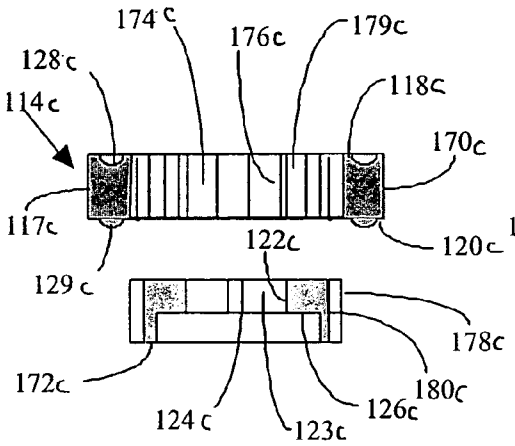


Fig. 11

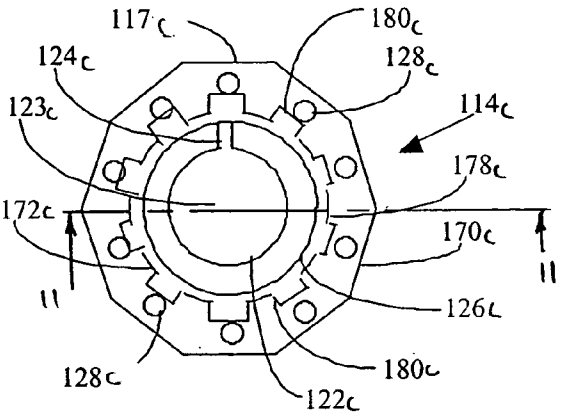


Fig. 12

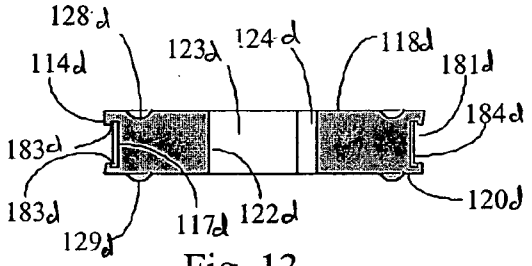


Fig. 13

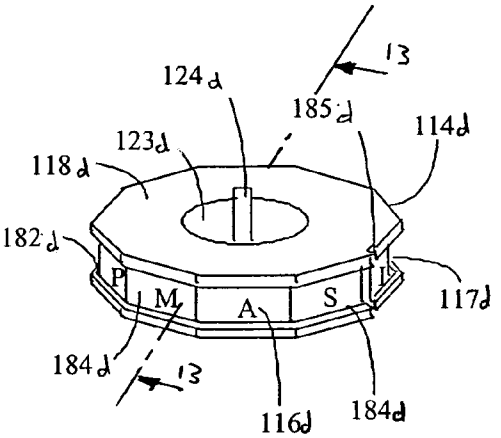


Fig. 14

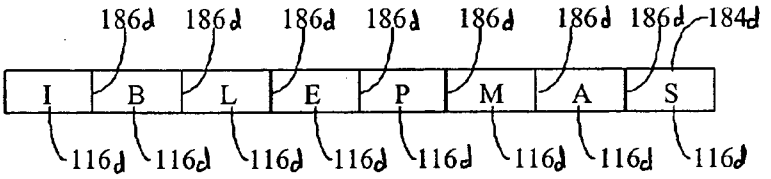


Fig. 15

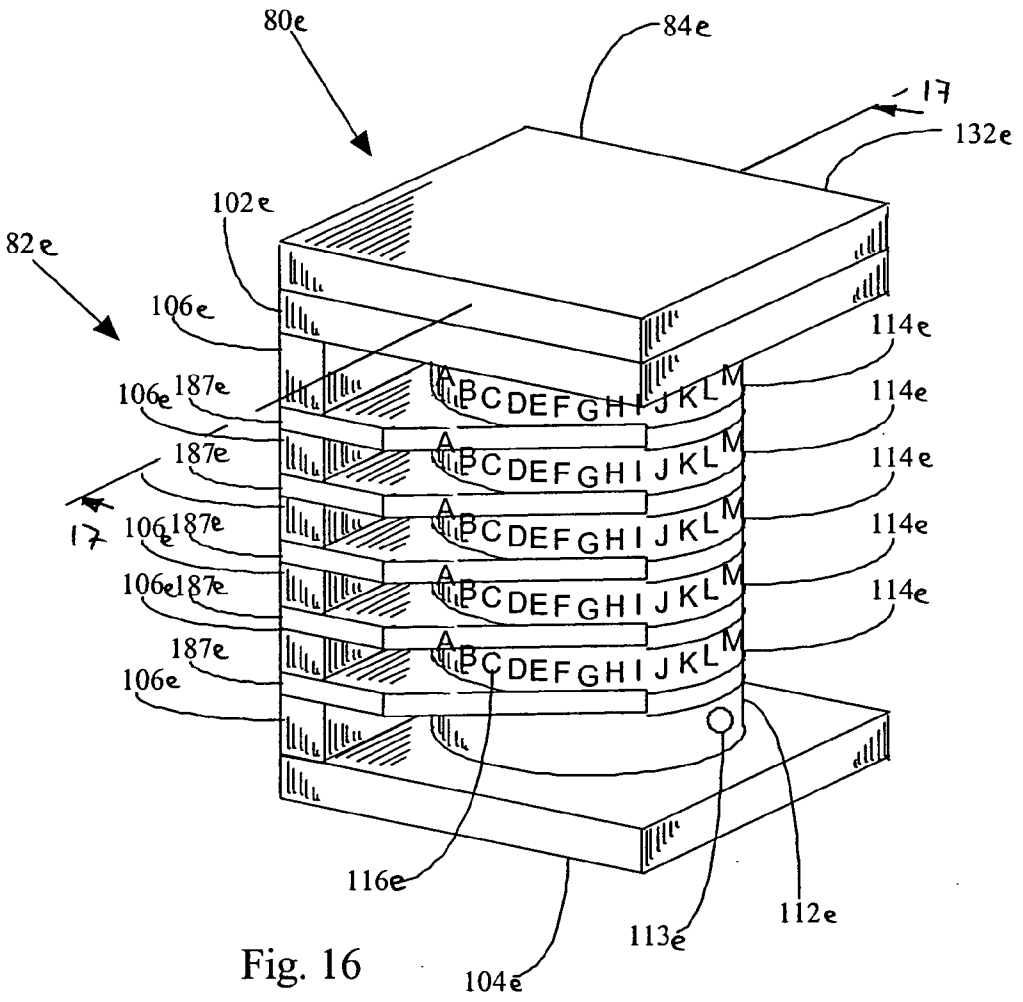
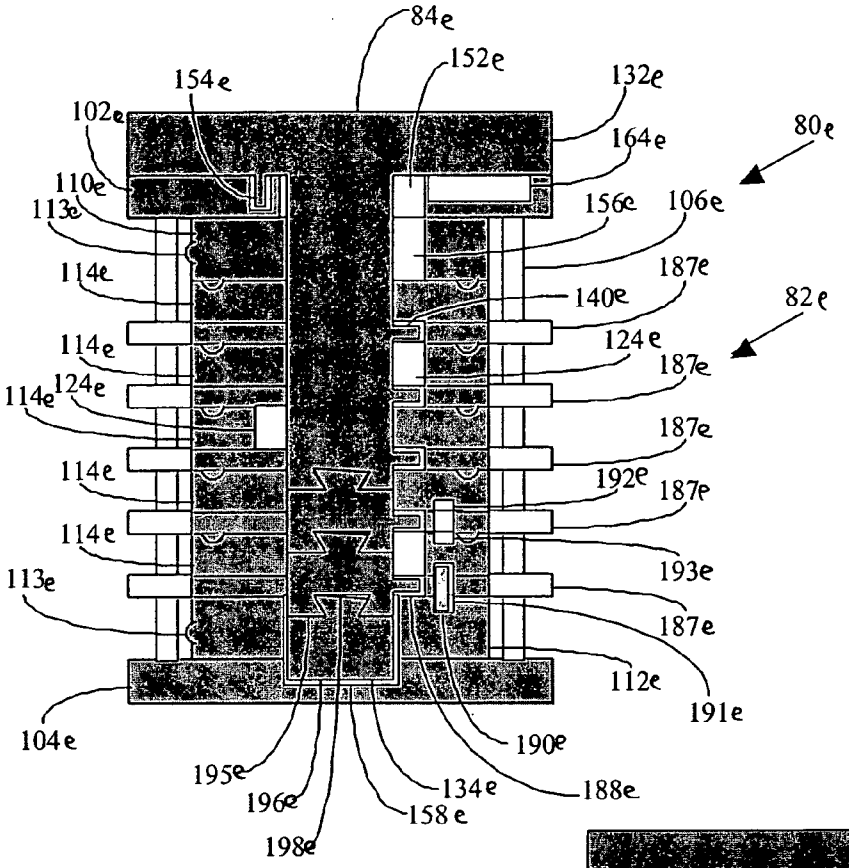

80e
84e
17
132e
102e
82e
106e
114e
187e
A B C D E F G H I J K L M
17
116e
112e
113e
104e

Fig. 16


84e
152e
154e
132e
102e
164e
80e
110e
113e
156e
106e
114e
187e
140e
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114e
124e
187e
114e
124e
187e
114e
192e
187e
114e
193e
113e
187e
112e
191e
104e
190e
195e
188e
196e
134e
158e
198e

Fig. 17

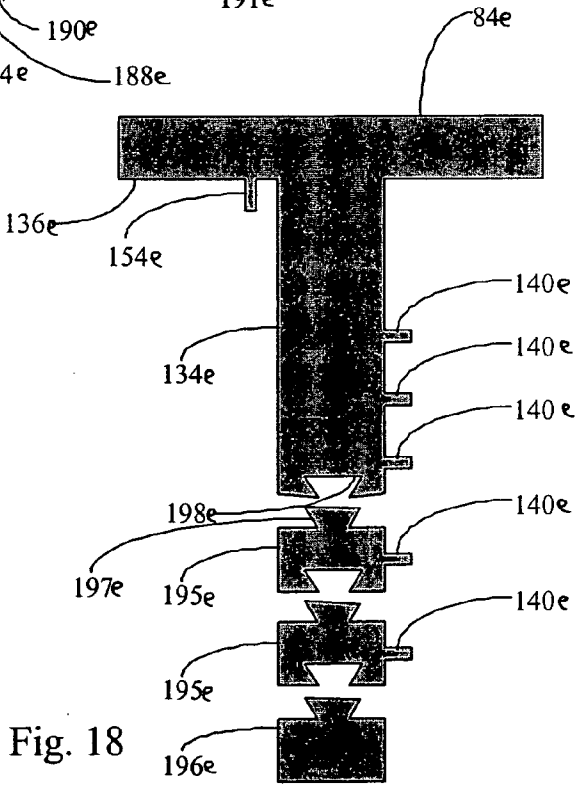

84e
136e
154e
140e
134e
140e
140e
198e
140e
197e
195e
140e
195e
196e

Fig. 18

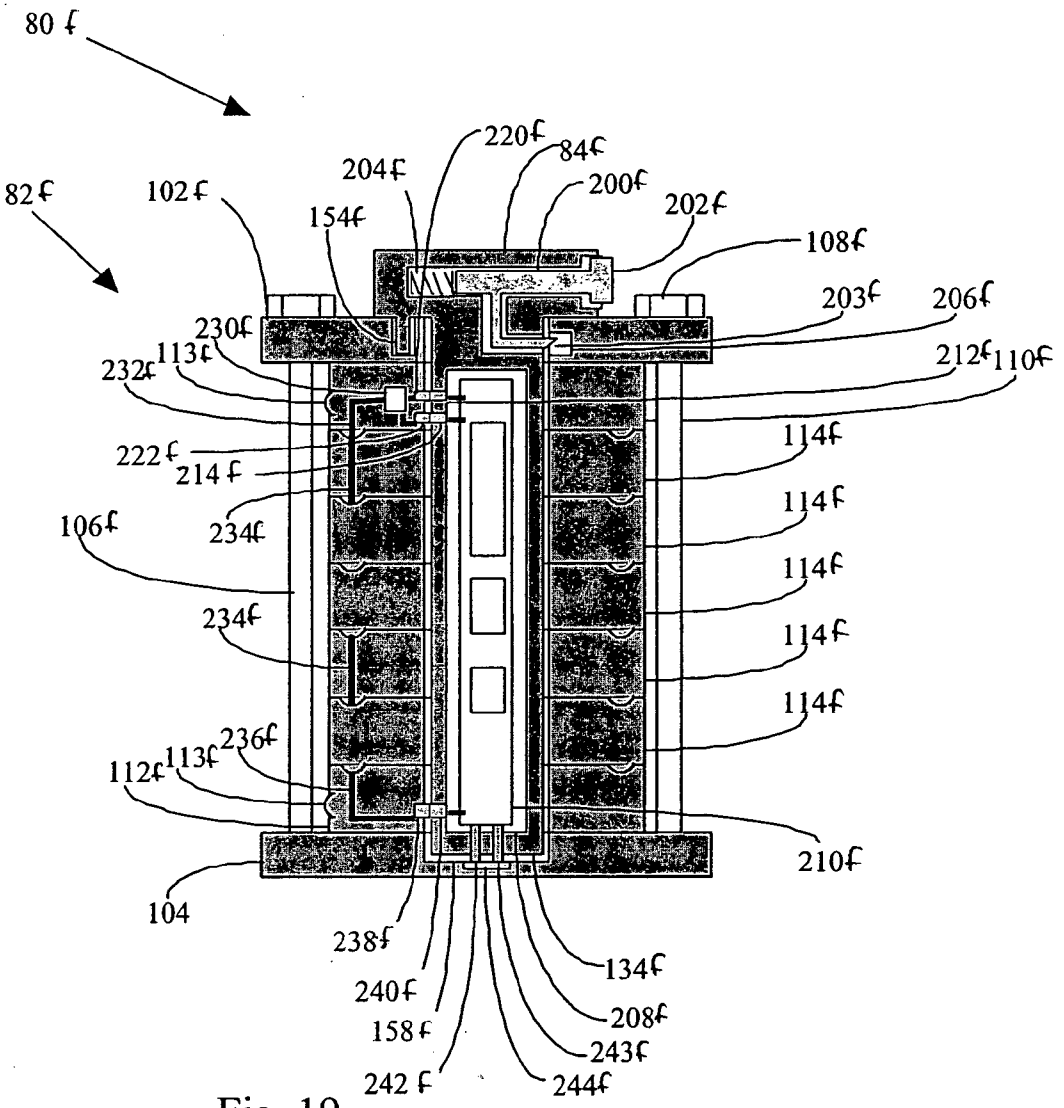
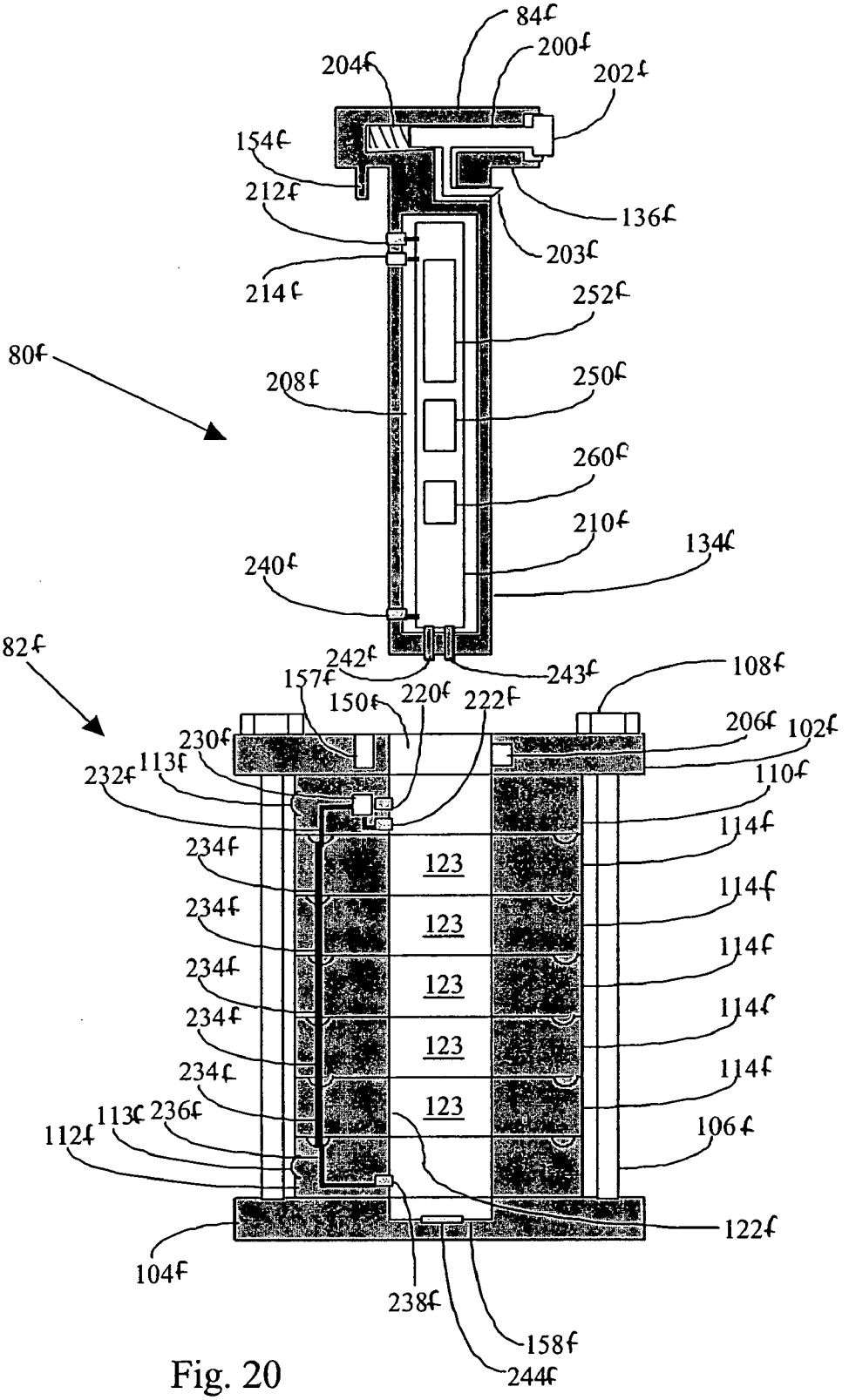

80f
82f
102f
154f
204f
220f
84f
200f
202f
108f
203f
206f
230f
113f
232f
212f
110f
222f
214f
234f
114f
106f
234f
236f
112f
113f
210f
104
238f
240f
158f
242f
134f
208f
243f
244f

Fig. 19


84f
200f
202f
204f
154f
212f
136f
203f
214f
252f
80f
208f
250f
260f
210f
134f
240f
82f
242f
243f
108f
157f
150f
220f
222f
206f
102f
230f
113f
232f
110f
114f
234f
123
114f
234f
123
114f
234f
123
114f
234f
123
114f
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123
114f
106f
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112f
122f
104f
238f
158f
244f

Fig. 20

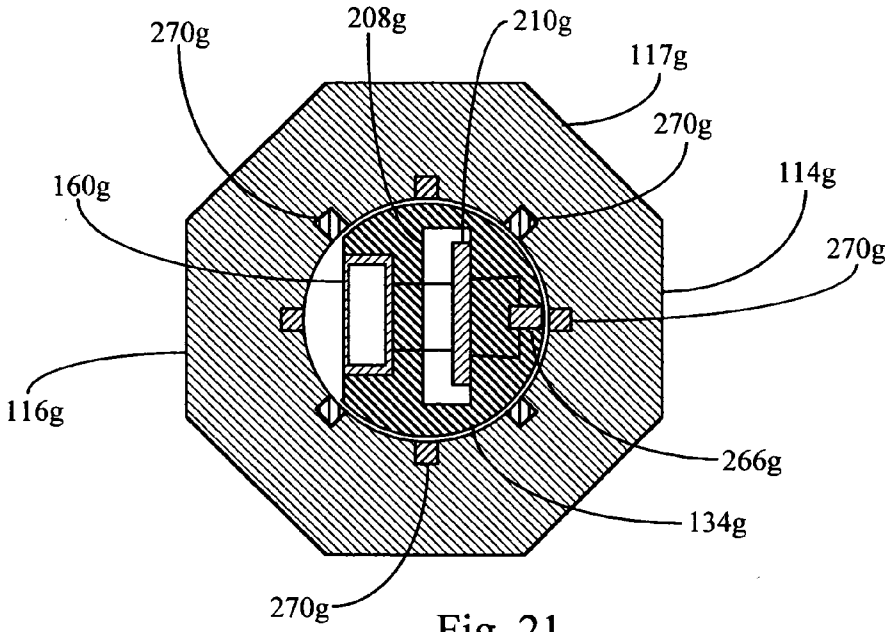

270g
208g
210g
117g
270g
160g
114g
270g
116g
266g
134g
270g

Fig. 21

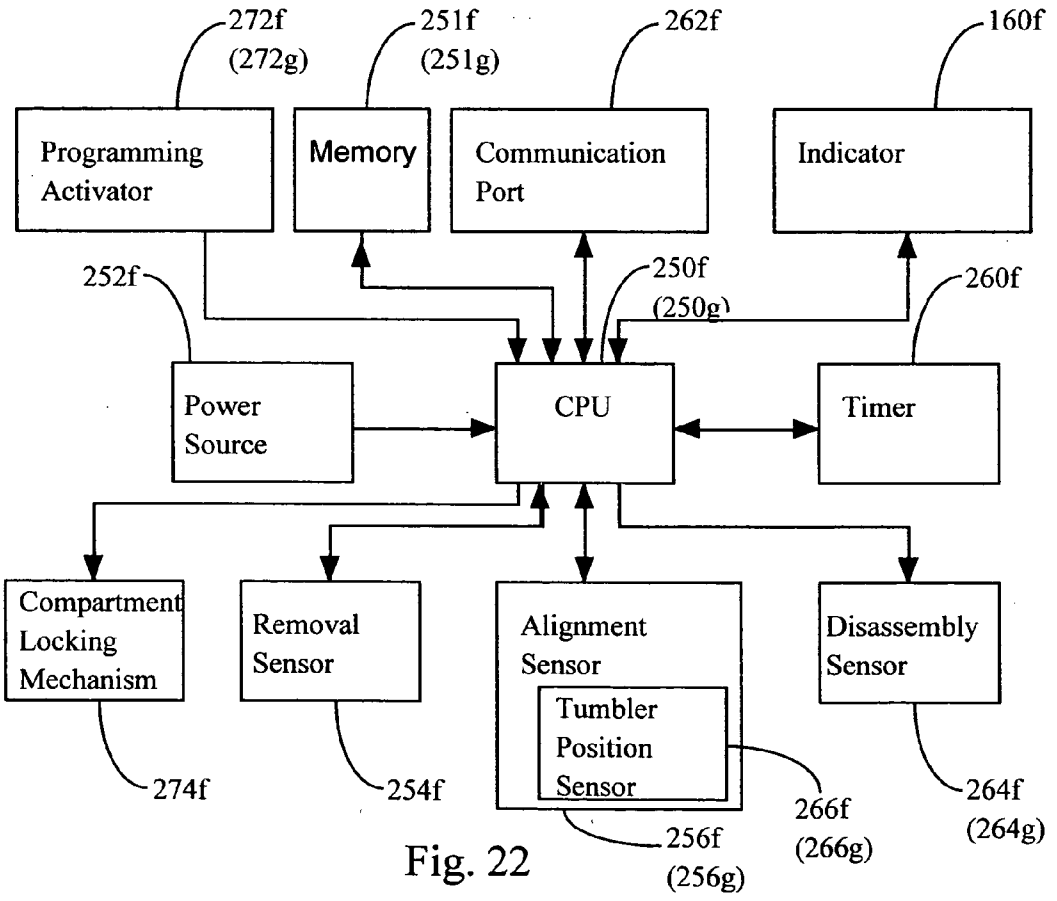

272f
(272g)
251f
(251g)
262f
160f
Programming Activator
Memory
Communication Port
Indicator
252f
250f
(250g)
260f
Power Source
CPU
Timer
Compartment Locking Mechanism
Removal Sensor
Alignment Sensor
Tumbler Position Sensor
Disassembly Sensor
274f
254f
266f
(266g)
256f
(256g)
264f
(264g)

Fig. 22

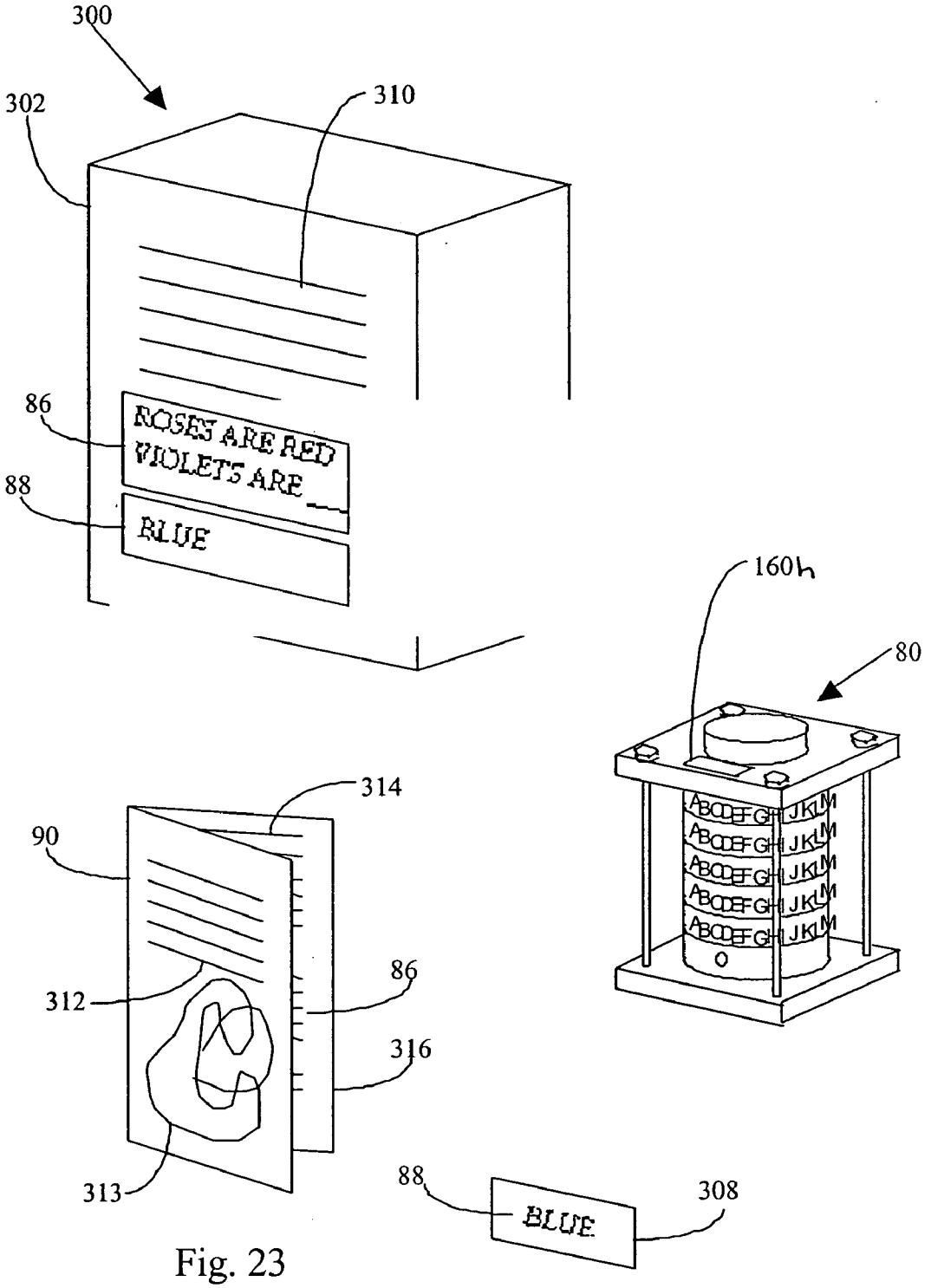

300
302
310
86
ROSES ARE RED
VIOLETS ARE
88
BLUE
160h
80
314
90
312
86
316
313
88
BLUE
308

Fig. 23

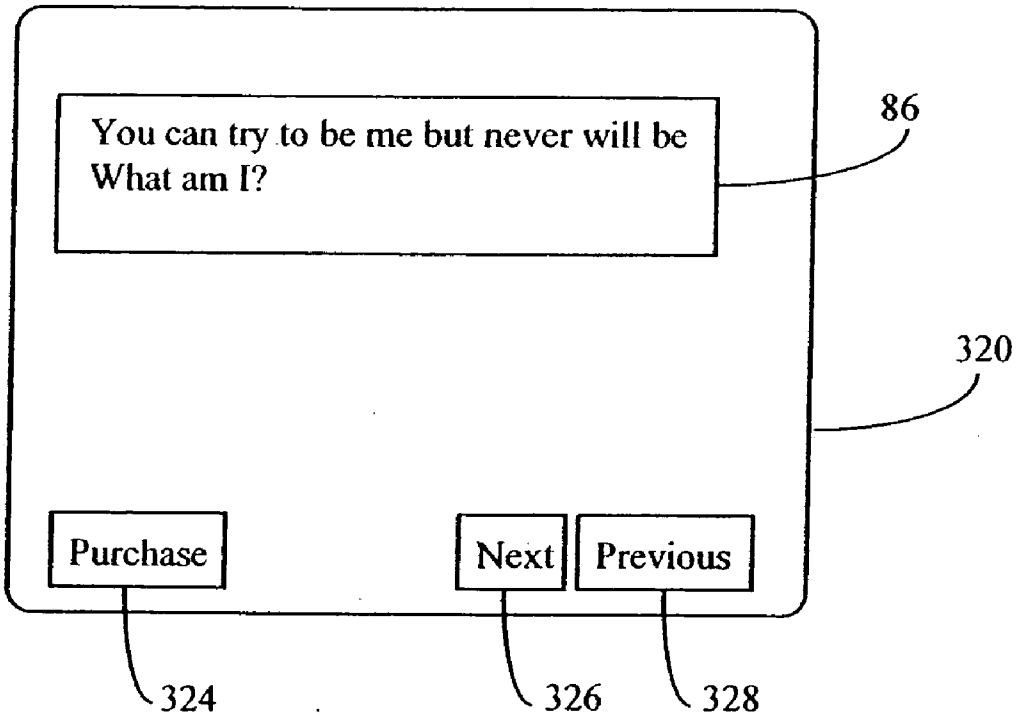

You can try to be me but never will be
What am I?
86
320
Purchase
Next
Previous
324
326
328

Fig. 24

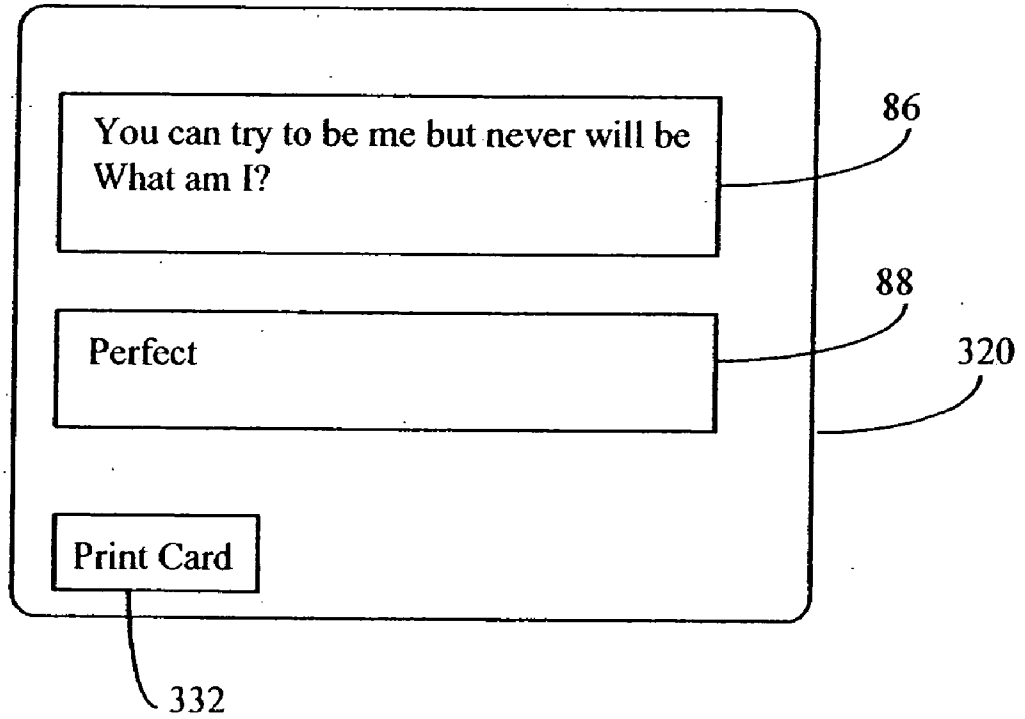

You can try to be me but never will be
What am I?
86
Perfect
88
320
Print Card
332

Fig. 25

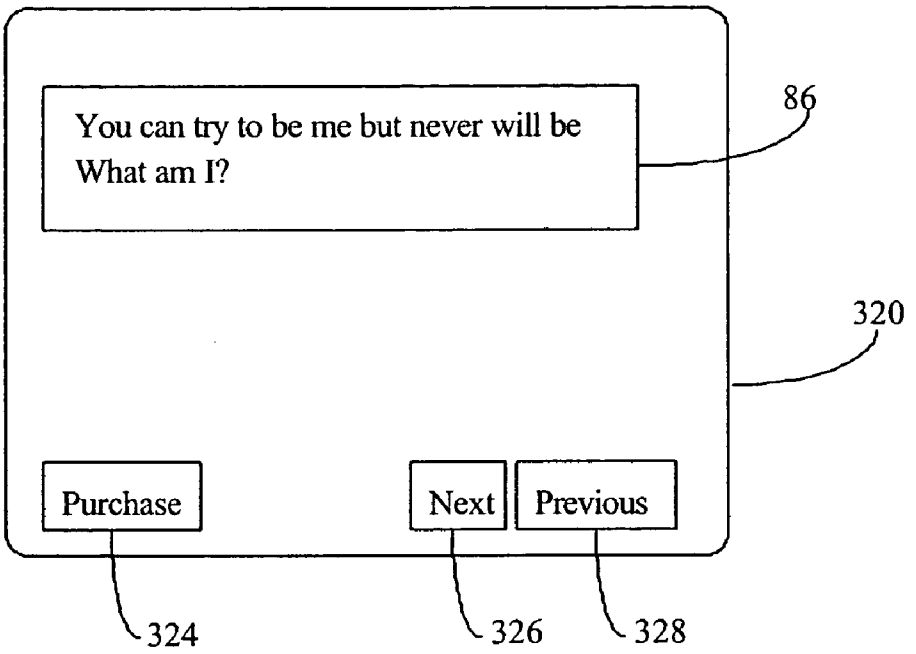


Fig. 25A

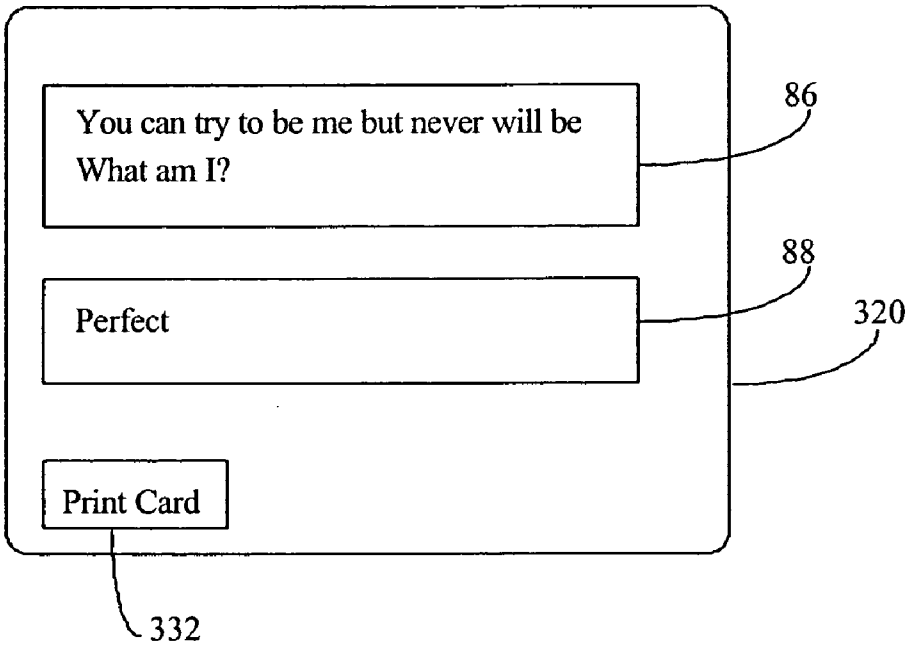


Fig. 25B

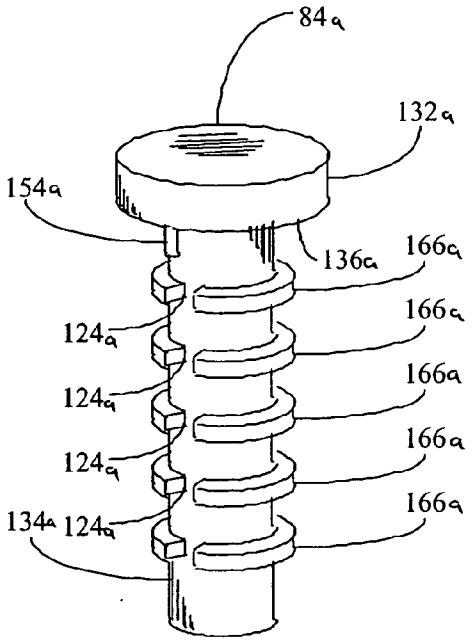
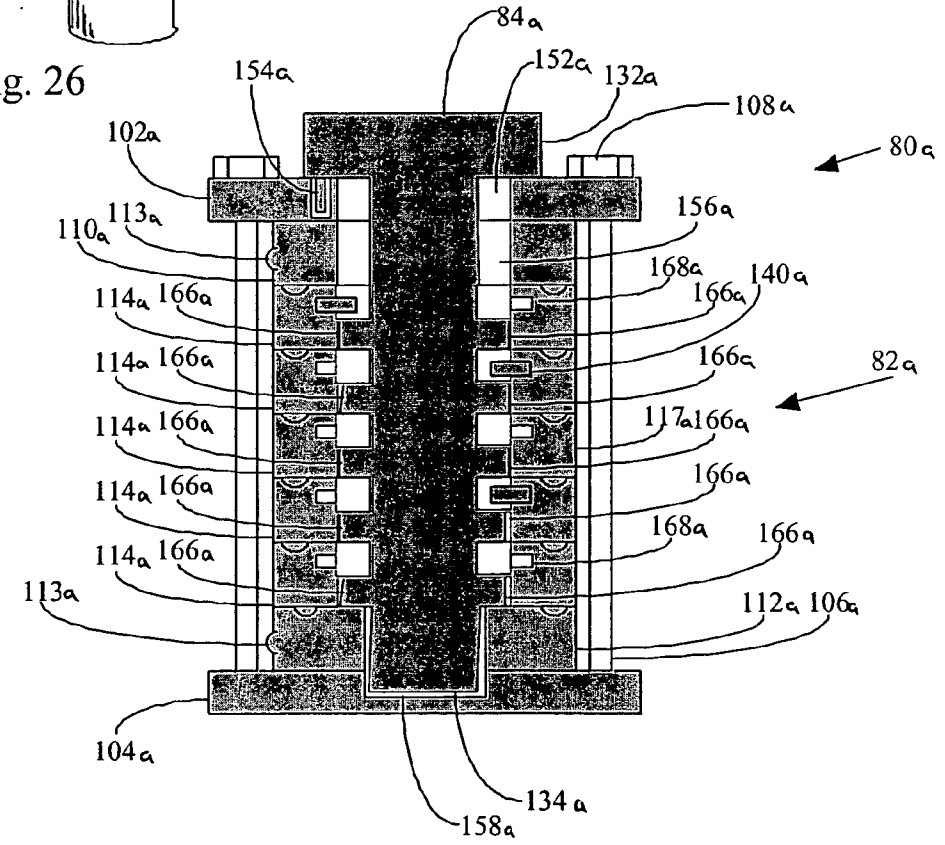

84a
132a
154a
136a
166a
124a
134a

Fig. 26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132a
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102a
80a
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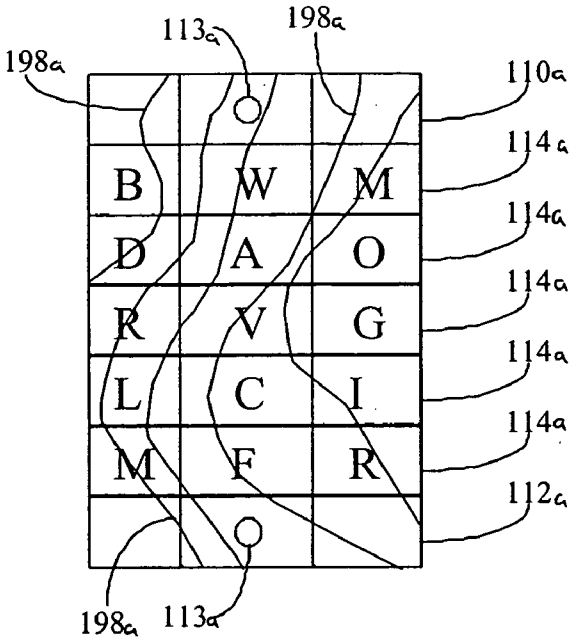
117a
112a
106a
104a
158a
134a

Fig. 27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198a
110a
114a
114a
114a
114a
114a
112a
B W M
D A O
R V G
L C I
M F R
198a
113a

Fig. 28

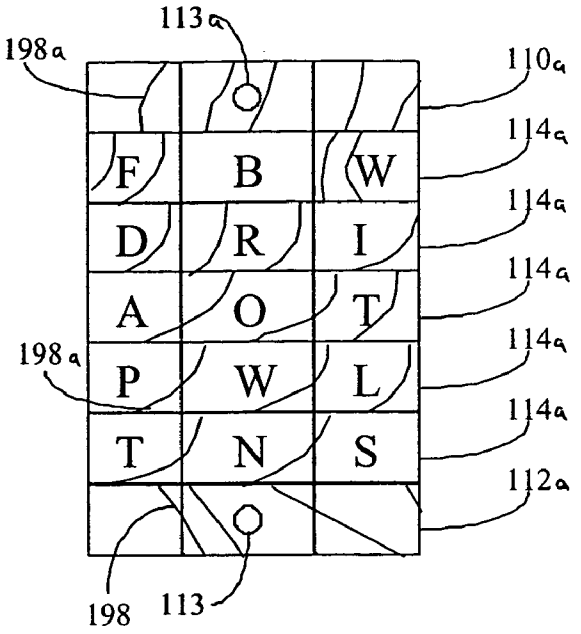
113a
198a
110a
114a
114a
114a
114a
114a
112a
F B W
D R I
A O T
198a
P W L
T N S
198
113

Fig. 29

WORD PUZZLE ASSEMBLY AND METHODS RELATED THERETO

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not applicable.

BACKGROUND OF THE INVENTION

[0003] This invention relates generally to locking compartments and more specifically to an assembly that includes a compartment that is concealed when a key member is received within rotatable tumblers and related methods.

[0004] This section of this document is intended to introduce various aspects of art that may be related to various aspects of the present invention described and/or claimed below. This section provides background information to facilitate a better understanding of the various aspects of the present invention. It should be understood that the statements in this section of this document are to be read in this light, and not as admissions of prior art.

[0005] A recent book by Author Dan Brown, "The DaVinci Code" (hereinafter "the book"), has generated a renewed interest in mysteries and word puzzles. Featured in the book is a contraption referred to as a DaVinci Cryptex (hereinafter "the Cryptex"). As described, the Cryptex is a cylindrical assembly that is generally small enough to be manipulated within a person's hands and includes multiple rotating sections and a "key" that is removably receivable within the rotating sections. The exterior of each Cryptex section has the alphabet inscribed around its perimeter. Characters in the book are presented with a mystery/puzzle, the solution of which is a single word answer, presumably of a character length equal to the number of rotating sections in the Cryptex. The sections can be rotated so as to spell the correct word answer to the puzzle after which the key is removable from the lock which reveals the text of a new puzzle written on papyrus.

[0006] As the story in the book progresses, the characters go on an elaborate journey in search for clues regarding the correct answer word and, over time, ascertain the correct word which enables removal of the key. In the book, one of the Cryptex components forms a compartment in which an item (e.g., a second smaller Cryptex, a note, an item, etc.) can be concealed until the key is removed. In the book a message is written on a sheet of papyrus that is placed within the compartment.

[0007] In addition to the components above, the Cryptex in the book includes a glass vial of vinegar presumably within compartment that is designed and positioned with respect to the other Cryptex components to break if the Cryptex is forced open prior to the tumblers being aligned to spell the correct word answer. Vinegar apparently destroys papyrus and hence would destroy the message printed on the papyrus if spilled thereon. Thus, the characters in the book, in effect, get only one chance to open the Cryptex correctly.

[0008] While a Cryptex is an interesting contraption, the Cryptex described in the book has several shortcomings as a product for mainstream mystery and puzzle use. First, for a Cryptex like the one described in the book, the Cryptex is specifically designed for a single correct answer word and the Cryptex cannot be reused with other puzzles and associated answer words. A Cryptex that has only a single correct answer word can only be effectively used a single time with a specific person—once the answer word is determined by a person, the word is known and opening the Cryptex is no longer an interesting challenge.

[0009] Second, where separate Cryptex have only a single answer word, the cost of manufacturing the unique Cryptex would be relatively expensive. To this end, where there are 1000 separate puzzles and associated answers, 1000 differently configured Cryptex would have to be designed and manufactured—a costly proposition.

[0010] Third, as with most products that can only be effectively used once, where a Cryptex has only a single answer word, a maximum purchase price for most purchasers will typically be low. A low purchase price combined with the costs of manufacturing many different Cryptex configurations (i.e., a separate configuration for each puzzle and associated answer word) would make it difficult at best to make a profit in the Cryptex business.

[0011] Fourth, while the concept of destroying a message or item inside a Cryptex if the Cryptex is opened prior to spelling the correct answer word via the Cryptex tumblers is intriguing, using a breakable glass vinegar vial or the like is a messy and potentially dangerous solution which would not be acceptable to many potential purchasers.

[0012] Fifth, one of the interesting things about the journey to find clues to the correct word answer in the book is that an elaborate and automatically unfolding scheme is set up to yield the clues over time. In the book, the scheme generally involves activities independent of the Cryptex. While it would be extremely difficult to set up a scheme as elaborate as the one in the book, it would be advantageous if answer clues could be automatically presented over the course of a predetermined period thereby simulating a journey akin to the journey that occurs in the book. The Cryptex in the book is incapable of simulating a journey alone.

[0013] Sixth, in many cases a Cryptex user may want to come up with her own puzzle and answer word that may have a special meaning to the user and a person that receives the Cryptex. Here, where Cryptex are configured for use with a single answer word, personalized puzzles and answer words usually would not be supported.

[0014] Seventh, Cryptex like the one in the book require at least two people to be useful, a first person to design the mystery, craft the puzzle and the answer word and configure the Cryptex and a second person to receive the Cryptex and the puzzle and to solve the puzzle to reveal the contents of the compartment. In at least some cases it would be advantageous to have a system whereby a single person could use a Cryptex to play a mystery game.

[0015] Locking mechanisms have been designed for luggage and the like that include tumblers and a locking key received therein where the key is only removable when the tumblers are aligned in a specific orientation (e.g., so that a numeric code is aligned along an axis perpendicular to the tumblers). Here, in some cases, the mechanisms are

designed so that the codes can be altered in some fashion. For instance, an exemplary locking mechanism includes a spring loaded configuration wherein, when the tumblers are in the unlocked position, a spring loaded member can be slid into a code setting position, the tumblers can be rotated until a new desired code is aligned and the spring loaded member can then be released.

[0016] While luggage type locking mechanisms are useful for locking luggage compartments or the like, luggage type locking mechanisms do not include a separate compartment that is concealed when the key is received within the tumblers and therefore are not suitable for use as a Cryptex. In addition, while a message or item could be placed inside a luggage compartment and locked therein via a luggage type lock, the resulting configuration and operation would not have the same appeal as a self contained Cryptex that can be held and manipulated in a users hands. Moreover, while codes can be altered in the case of some luggage type locking mechanisms, the length of the code cannot be altered in any known luggage type locking mechanism so that, even if. Furthermore, while spring type mechanisms have been designed for luggage locking mechanisms to modify codes, it is unclear how such mechanisms would be configured for use with a Cryptex that includes a concealed compartment.

[0017] Therefore it would be advantageous to have a Cryptex that can be used with more than a single puzzle and associated answer word. In addition, it would be advantageous to have a Cryptex wherein the answer word could be modified relatively easily and where a single person, in at least some cases, could use the Cryptex to play a puzzle game. Moreover, it would be advantageous to have a system wherein clues could be periodically provided to a Cryptex user thereby simulating a journey in search of clues.

BRIEF SUMMARY OF THE INVENTION

[0018] Certain aspects commensurate in scope with the originally claimed invention are set forth below. It should be understood that these aspects are presented merely to provide the reader with a brief summary of certain forms the invention might take and that these aspects are not intended to limit the scope of the invention. Indeed, the invention may encompass a variety of aspects that may not be set forth below.

[0019] It has been recognized that a Cryptex type assembly can be configured that includes both a retainer for a message or an item and a tumbler assembly where the tumblers can be manipulated to alter a correct answer word that enables a key to be removed from the tumblers. Thus, a Cryptex like assembly can be provided that can be used multiple times and with many different word puzzles.

[0020] It has also been recognized that an electronic Cryptex type assembly can be provided that includes a processor and a small display screen (e.g., LCD display, other flat panel technology, etc.) wherein a message may be displayed via the screen when the key is removed. In this case, the message stored for presentation via the display screen may be easily altered and, in at least some cases, could be modified over time.

[0021] In some embodiments of the present invention an exemplary Cryptex is a linear combination lock that is generally opaque or translucent so that its inner workings are not visible. The lock may include multiple rotating sections or tumblers with a fixed linear key that has a series of projecting pins along its length. Each tumbler may include a series of markings (e.g. the 26 characters of the alphabet or 10 digits) on the exterior wall(s) and a central hole through which the key passes to be locked in or removed when unlocked. In some cases the tumblers also have an enlarged countersunk hole or recess centered over the main hole. Here, the tumblers are sized in height to match the spacing of the pins in the key and the counter sunk holes are sized so that the tumblers can rotate freely around the projecting pins of the key. The tumblers may be in a cylindrical form, but other sectional shapes can be used as desired.

[0022] Each tumbler may also have a keyway cut radially from the center hole through to the countersunk hole. The keyways are sized to allow the projecting pins of the key to pass through the tumbler when properly aligned. In this manner when the tumblers are arranged according to a combination by orienting the markers in a pattern against a fixed alignment marker, the keyways are then all aligned in a row. The projecting pins of the key pass thru all of the keyways and the key is easily removed from the lock.

[0023] Besides having the rotating tumblers, in at least some embodiments the lock includes fixed top and bottom sections where one of the sections includes an alignment marker. The top and bottom sections are secured together so that when the key is in the lock and the lock is locked, the tumblers interfere with the key and the key cannot be removed from the lock. This can be done using external posts between the top and bottom sections or any of a variety of other fastening or joining methods. When posts are used, they can be glued, attached with threads and matching nuts (e.g. with tamper resistant or locking nuts), welded, or riveted to the top and bottom.

[0024] The top section may have a hole cut in it and a keyway (if the hole is not sized so the projecting pins can pass thru it) so the key can pass through it. The bottom section may generally be solid, although it can have a countersunk hole to prevent the key from moving laterally. In some embodiments, when the key is inserted into the hole, the key is restrained by a pin, flange, or gear teeth from rotating, so that the key maintains a fixed position relative to the lock.

[0025] In some cases the tumbler only has the center hole and the cut keyway, but not the countersunk hole for the pins of the lock. Instead a fixed spacing washer can be inserted between tumblers, the washer having a central hole sized to allow the key to be inserted and removed or to have a central hole and keyway positioned to align with the key and its projecting pins.

[0026] In some embodiments the key is designed so that it has a head that extends over the center hole and the keyway in the top section of the lock. The head prevents a user from sighting down the inside of the lock to crack its combination by looking for the keyways. In some cases the key head is sized so that it covers over any nuts or fasteners used with the posts to connect the top and bottom parts of the lock, providing protection against tampering with the nuts to open the lock.

[0027] To assist with aligning the tumbler sections, a ratchet or detente mechanism may be provided so that the

external markings are easy to maintain in a chosen position and do not rotate spontaneously. One design for a ratchet mechanism is to provide small recesses or dimples spaced on the top of each tumbler according to the number and spacing of the external markings of the tumbler. The bottom surface of each tumbler forms one or more rounded bumps that extend outwardly. When stacked together the bump(s) of one tumbler naturally rest in one of the dimples of an adjacent tumbler. Just enough space is provided between the assembled tumblers so that when one tumbler is rotated its projecting tip(s) or bump(s) rise out of one dimple and naturally drop into the next dimple after partial rotation.

[0028] In some cases it is desirable that the pattern of letters that opens the lock be adjusted to another pattern (word). To do this, in a t least some cases, the lock is taken apart so the individual tumblers can be removed and separated from each other. To allow a user to change which letter on each tumbler is aligned with the keyway when the tumblers are in the unlocked orientation, the tumbler is composed of two pieces, an outer one and an inner one. The inner and outer pieces can be separated and the inner one rotated so the keyway is positioned to align with a new external letter or marking. The inner and outer pieces are then pressed together. To keep the two pieces properly oriented the inner and outer pieces may be in the shape or a regular polygon with the number of side equal to the number of markings on the perimeter of the outer piece of the tumbler. Alternately a series of matching gear teeth (the number of which equals the number of external markings) can be cut in the inner and outer pieces so they mesh together. Other positioning methods are anticipated, such as pins or one of the pieces can have a partial gear teeth cut into it, but not limited to these.

[0029] To secure the inner and outer sections together one of the sections may be undercut or have a ridge to keep the two sections together.

[0030] In some cases, it may be desirable to construct a Cryptex from highly valued materials such as wood, stone or metal. The machining of complex surfaces in such materials can be cost prohibitive. A tumbler composed of three pieces would allow changing letters on tumblers without requiring complex machining on the outer, visible portion of the tumbler. The previously mentioned inner and outer rings would become the inner and middle rings of a three ring arrangement. The inner and middle rings would operate as previously described. The outer ring can have a round, easily machined hole through its center, into which the outside of the middle ring is fit via any of a number of fastening techniques (e.g. pressure, adhesive). The combination of middle and outer rings then perform as the outer ring in the previous description.

[0031] When the Cryptex has provision for a seven letter word (forming a seven letter combination), but the word chosen to unlock it only has five letters, the lock is taken apart and the bottom two tumblers can be pinned together and to a non-rotating lock bottom section. In this example, the two bottom tumblers are aligned so that their keyways allow the key to be removed without further action. Preferably, when so aligned, the external markings include a space or blank "marking" that is aligned with the alignment marker on the top section or bottom section In this way a person using the Cryptex will know that the bottom two tumblers are not used.

[0032] Another method to accommodate shorter words is to assemble the lock with only 5 tumblers and to adjust the length of the linear key. One method of adjustment is to cut the key to the proper length, however this is not desirable as the key could not thereafter be used with longer words. Instead the key may be made in segments equal in length to the height of one of the tumblers. By removing two sections a key for 7 tumblers can be adjusted to fit a lock of five tumblers. Any method of adjusting the key length must ensure the key does not come apart when in or being removed from the lock and that the key or any section of it does not rotate in the lock.

[0033] Another Cryptex type embodiment includes a secret message associated with a key and incorporates the feature of allowing the key to be withdrawn when the tumblers are in any position. The secret message may be presented in this case on a display screen or the like when displayed. In this case, if the tumblers are not properly aligned to define the correct answer word when the key is removed, the secret message may be erased. Here, when the tumblers are properly aligned, the key is removable to reveal the secret message via the display.

[0034] In some electronic versions of Cryptex type assemblies the key may not have pins along its length. Instead the key may have an internal space to accommodate a circuit board including a processor, memory, power source, indicator, timer, a variety of sensors, and a communication port. Here, the memory of the key may be programmed with an external computer or PDA device with a message that is to be presented to the user via the indicator (e.g. a LCD display or a speaker) when the key is removed from the unlocked lock.

[0035] The tumblers in this embodiment may be arranged as before without the need for the countersunk holes. Instead the tumblers each may have an electrically conductive lead that passes through from the top to the bottom of the tumbler, e.g., from one ratchet dimple to the rounded projection below. The top and bottom sections of the lock have electrical contacts that are oriented to make contact with matching contacts on the key when the key is fully inserted. The top contact is connected to one of the ratchet rounded bumps for the top section and the bottom section contact is connected to one of its ratchet dimples. While the use of the ratchet mechanism is described, other provisions or areas for conducting electricity through the top and bottom sections and tumblers are anticipated.

[0036] When the tumblers are aligned so that the external markings match the pattern to unlock the lock a conductive pathway is established between the top section contact and the bottom section contact through every tumbler. The key has matching electrical contacts between the processor and the top and bottom section contacts. The processor may detect the presence of this conductive pathway and set an unlocked flag. The key also has a sensor to determine that it has been removed from the lock, for example using another set of electrical contacts, a switch, a photocell, etc. When the key is removed and the unlocked flag is set, the key may present the secret message via the display screen.

[0037] In the example here, whenever the tumblers are not properly aligned, the processor unsets the unlocked flag. If the key is removed while the flag is unset, the processor detecting the removal via its sensor for this purpose will not

present the secret message via the indicator. Instead no message can be presented or one that indicates that the wrong word or pattern of markings was used when removing the key may be presented. If desired the key can also indicate that the key will become inert for a period time that the processor uses the timer to measure. The key can be reinserted in the lock, but the key will not respond and present any message other than a period of time that must pass before the next key removal will be confirmed (e.g. a day). In this manner, several tries can be made to guess the alignment pattern of the tumblers, but consecutive attempts are separated by periods. Using this design the user cannot determine what the correct alignment of the tumblers must be because the electrical contacts on the tumblers are hidden from view.

[0038] A sensor may be used by the key to determine if the lock is being disassembled. Upon detecting of this condition the processor can erase the secret code so that it will never be displayed.

[0039] If desired the key with projecting pins can also be used with the electronic lock, but in this case the key can only be removed when the tumblers have been properly oriented to unlock the lock. In this case the removal sensor is no longer needed, but the lock disassembly sensor can be used.

[0040] To prevent the key from being inadvertently removed from the lock before the tumblers are aligned as desired, a latch, spring, or interference ridge may be used. Here, to remove the key a user must press in the latch or spring thereby de-latching the key for removal.

[0041] In some cases it is desirable to purchase the Cryptex with a preprogrammed word as the alignment pattern for the tumblers. It is anticipated that the purchaser will select a Cryptex at a store or via the Internet with a preprogrammed answer word and an accompanying word puzzle, mystery, rhyme, or phrase whose solution or conclusion is the preprogrammed answer word. Typically the word puzzle is printed as part of a greeting card format that is given to the recipient of the Cryptex without the preprogrammed answer word printed on the card. The greeting card can be customized to include another message such as "Happy Birthday" or "Congratulation on Graduating". Inside the Cryptex can be a second secret message, for example a location where a present can be found. The recipient then guesses the correct word or order of the external markings to open the Cryptex.

[0042] If the recipient fails to guess the correct word the person giving the Cryptex can provide other hints. To that end a Cryptex with a very challenging word may include more than one card so additional hints can be provided. Otherwise the original card can include an Internet web address where additional hints for this specific Cryptex are provided, for example a new hint every day or 8 hours.

[0043] In the case of an assembly where the unlocked position of the tumblers can be changed, suitable greeting cards with word puzzles and matching solution or answer words can be sold. In at least some cases it is contemplated that the answer word may be provided separate from the card. The purchaser of the assembly can buy the card, program the word into the assembly and give the assembly and the card with the word puzzle to a recipient to unlock.

[0044] Alternately, the owner of the Cryptex can review a list of puzzle questions on the Internet and purchase a greeting card with that question for download over the Internet (e.g. in a universal high quality image format such as the PDF format) to be printed on their printer. Additionally the text of the greeting card can be customized for the person to receive the Cryptex with their name or additional greeting message. The answer to the question is then provided for the purchaser/giver to retain. It may be desirable in this type of commerce that the puzzle question and the answer are not provided at the same time until a purchase has been made, otherwise the owner of the Cryptex may print the question and the answer without payment.

[0045] In some cases an answer word may be proved and the user may select a difficulty level for the puzzle question. When a purchase is made the puzzle question can be sent to over the Internet in a greeting card format that can be customize by the purchaser.

[0046] In other cases the Internet can be used to purchase a Cryptex where the puzzle question and answer is either specified and entered by the purchaser or selected from previously created questions and answers. The purchaser is then shipped an assembled Cryptex that is unlocked using the specified answer, a matching greeting card, and the answer on a separate piece of paper for retention. If desired the answer can be retained on the Internet site providing the Cryptex.

[0047] In at least some cases an external display screen or an audio output mechanism may be provided on at least one of the assembly components for providing periodic clues to an assembly user regarding the correct answer word. In addition, in at lest some cases, the external display screen may be used to provide the message when the key is successfully removed from the tumblers.

[0048] In some embodiments it is contemplated that a USB or a wireless system may be used to transmit new answer words to electronic Cryptex type assemblies wherein assembly processors could then modify the correct answer words associated therewith. Thereafter, a puzzle could be e-mailed or otherwise provided to a user of the assembly so that the user could play a word game independent of other users.

[0049] These and other objects, advantages and aspects of the invention will become apparent from the following description. In the description, reference is made to the accompanying drawings which form a part hereof, and in which there is shown a preferred embodiment of the invention. Such embodiment does not necessarily represent the full scope of the invention and reference is made therefore, to the claims herein for interpreting the scope of the invention.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0050] The invention will hereafter be described with reference to the accompanying drawings, wherein like reference numerals denote like elements, and:

[0051] **FIG. 1** is a perspective view of a first embodiment of a Cryptex type assembly in its locked state, a word puzzle associated with the assembly and an answer to the word puzzle;

[0052] **FIG. 2** is a perspective view of the assembly of **FIG. 1** in an unlocked state showing a key removed from the lock;

[0053] **FIG. 3** is a perspective view illustrating one of the tumblers of **FIG. 1**;

[0054] **FIG. 4** is a second perspective view illustrating the tumbler of **FIG. 3**;

[0055] **FIG. 5** is a sectional view taken along the line **5-5** of **FIG. 1**;

[0056] **FIG. 6** is a sectional view similar to **FIG. 5**, albeit with the assembly in an unlocked state showing the key removed;

[0057] **FIG. 7** is an exploded sectional view of an alternate embodiment of a tumbler composed of inner and outer pieces that can be rotationally rearranged to assume several different positions when placed together and taken along the line **7-7** in **FIG. 9**;

[0058] **FIG. 8** is similar to **FIG. 7**, albeit illustrating the inner and outer pieces in a mating orientation;

[0059] **FIG. 9** is a plan view of the tumbler of **FIG. 8** with the tumbler in a first orientation;

[0060] **FIG. 10** is similar to **FIG. 9**, albeit with the inner piece in a different orientation with respect to the outer tumbler piece;

[0061] **FIG. 11** is similar to **FIG. 7**, albeit illustrating another two piece tumbler subassembly and taken along the line **11-11** in **FIG. 12**;

[0062] **FIG. 12** is similar to **FIG. 9**, albeit illustrating the tumbler of **FIG. 11**;

[0063] **FIG. 13** is a cross sectional view of a tumbler with replaceable markings on a separate strip taken along the line **13-13** in **FIG. 14**;

[0064] **FIG. 14** is a perspective view of the tumbler of **FIG. 13**;

[0065] **FIG. 15** is a plan view of a separate strip of replaceable markings;

[0066] **FIG. 16** is a perspective view of another embodiment of a Cryptex type assembly that includes spacers between tumblers;

[0067] **FIG. 17** is a cross sectional view taken along the line **17-17** of **FIG. 16**;

[0068] **FIG. 18** is a cross sectional view of the key of **FIG. 17** showing that the key can be split into different key lengths;

[0069] **FIG. 19** is a cross sectional view similar to **FIG. 17**, albeit of a third embodiment of a Cryptex type assembly including an electronic key;

[0070] **FIG. 20** is similar to **FIG. 19**, albeit with the key removed from the other assembly components;

[0071] **FIG. 21** is a cross sectional view of a tumbler and key wherein the tumbler includes multiple position sensors;

[0072] **FIG. 22** is a schematic view of circuitry associated with the third embodiment in **FIG. 19**;

[0073] **FIG. 23** is a perspective view of a gift set including a Cryptex, greeting card and an answer card along with a box used to market the set;

[0074] **FIG. 24** is a computer screen view of illustrating an Internet purchase of a Cryptex based greeting card;

[0075] **FIGS. 25A and 25B** are computer screen shots illustrating a series of steps performed to purchase and print a word puzzle in a greeting card format via the Internet or the like;

[0076] **FIG. 26** is a perspective view of an alternate embodiment of a Cryptex type key shaft;

[0077] **FIG. 27** is a cross sectional view similar to **FIG. 5**, albeit including the key of **FIG. 26** and differently configured tumblers;

[0078] **FIG. 28** is a side view of exemplary tumblers made from a grained material; and

[0079] **FIG. 29** is a side view of the tumblers of **FIG. 28** rotated to an unlocked alignment.

DETAILED DESCRIPTION OF THE INVENTION

[0080] One or more specific embodiments of the present invention will be described below. It should be appreciated that in the development of any such actual implementation, as in any engineering or design project, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with system-related and business related constraints, which may vary from one implementation to another. Moreover, it should be appreciated that such a development effort might be complex and time consuming, but would nevertheless be a routine undertaking of design, fabrication, and manufacture for those of ordinary skill having the benefit of this disclosure.

[0081] The present invention relates to the construction, programming and purchase of a Cryptex type assembly **80** (see **FIG. 1** and others) referred to hereinafter in the interest of simplifying this explanation as a Cryptex. Cryptex **80** is a lock assembly having an unlocking secret word, phrase or answer word **88** that is the solution or match to a word puzzle, mystery, rhyme, or phrase **86** (see **FIG. 25**). Cryptex **80** is typically given by one person to a recipient as a gift along with word puzzle **86**, for example, as part of a greeting card **90**. Answer word **88** is not given to the recipient. The Cryptex recipient must solve word puzzle **86** to obtain answer word **88** in order to open Cryptex **80**. Answer word **88** may be any alphanumeric combination of characters or a pattern of icons in sequence. While several different word puzzles **86** and answer words **88** are shown in the figures, the invention is not limited to those examples

[0082] Cryptex **80** shown in **FIG. 1** includes a lock **82** and a matching key **84**. Lock **82** is comprised of a top section **102**, a bottom section **104**, one or more linking members or connectors **106** (two of which are labeled in **FIG. 1**), which may be posts, bars, struts, or a solid extension between top section **102** and bottom section **104**. In some cases connector(s) **106** are secured to top section **102** and bottom section **104** with one or more mating devices **108** such as nuts, screws, bolts, rivets, etc. Mating devices **108** can be designed to be tamper proof or locking so they cannot be removed. In some cases connectors **106** can be welded (e.g. sonic or arc welding) or hammered (e.g. riveted) to top **102**

and bottom **104** sections. Together, top **102** and bottom sections with connectors **106** define a tumbler retainer.

[**0083**] Below top section **102** is an optional spacer **110** (see **FIG. 5**) that is fixed to top section **102** and above bottom section **104** is an optional spacer **112** that is optionally similarly fixed to or part of bottom **104**. An alignment marker **113** (or more than one marker) is placed on some portion of top section **102**, bottom section **104**, spacer **110**, or spacer **112**. The purpose of marker(s) is explained below.

[**0084**] Top section **102** forms a central opening **150** that is aligned with axis **300** when section **102** is stacked at one end of the tumbler stack. In addition, section **102** forms a keyway **152** that extends laterally from opening **150**. A hole **157** is formed in a top surface (not labeled) of top section **102** adjacent opening **150**.

[**0085**] In the illustrated embodiment, each of spacers **110** and **112** form a central opening **354** and **356**, respectively, and spacer **110** forms a keyway **156**. Bottom section **104** forms a central countersink hole, recess or opening **158**. As illustrated, when sections **102** and **104**, spacers **110** and **112** and tumblers **114** are stacked together, the components form a tumbler channel **360** (see **FIG. 6**) about tumbler axis **350**.

[**0086**] Between top **102** and bottom **104** sections are a series of rotating tumblers **114** which can be circular or multi-sided in plan view. Tumblers **114** are arranged in a stack about tumbler axis **350**. Each of the tumblers is similarly constructed and operates in a similar fashion in at least some embodiments and therefore, unless indicated otherwise and in the interest of simplifying this explanation, only one of tumblers **114** will be described here in detail.

[**0087**] Referring to **FIGS. 1-5**, on external surface or wall **117** of tumbler **114**, marks or indicia **116** are formed or printed that may include letters (including the space character) and/or numbers and/or icons. Typically, indicia **116** are uniformly spaced around external wall **117** of tumbler **114**, however gaps or spaces can be provided as well. The periphery of tumbler **114** is shown as a circle, however, it may include a plurality of flat surfaces (e.g., one surface per letter/number). When characters are used, tumbler **114** need not include all 26 characters of the alphabet. Instead, each tumbler may have a smaller number of characters (e.g., 6-8).

[**0088**] Each tumbler has a top (i.e., first) surface **118** (see **FIGS. 3 and 4**) and a bottom (i.e., second) surface **120**. When the tumblers **114** are stacked along axis **350**, the bottom surface **120** of one tumbler **114** rests on the top surface **118** of an adjacent tumbler. In addition to the external surface **117**, each tumbler has an internal surface **122** that defines an opening **123** that is centered on the tumbler axis **350** when the tumblers **114** are stacked. When the tumblers **114** are stacked, alignment markers **113** define an alignment axis **352** that is parallel to the tumbler axis **350** (see **FIG. 5**).

[**0089**] Vertical keyway, recess or gap **124** extends laterally from opening **123** and stops short of external wall **117**. Cut into bottom surface **120** is a countersunk hole or opening **126** that has the same center line as opening **123** and a radius generally equal to the distance from the center of tumbler **114** to the distal end of keyway or gap **124**. Openings **123** and **126** come together at a ridge and form a tumbler coupler or collar where gap **124** extends through a portion of the collar.

[**0090**] Optionally, tumblers **114** can have a detent feature or ratchet mechanism to help an assembly user keep tumblers **114** aligned after rotation. The detent mechanism is provided such that the separate tumblers **114** rotate more readily when indicia thereon is misaligned with markers **113** than when the indicia is aligned with the markers **113**. Thus, for instance, assuming six equispaced letters arranged about external surface **117**, if a first letter is aligned with marker **113**, initially the detent feature will impede rotation of the tumbler but, after rotation through a small angle (e.g., 5°), rotation will be relatively easy until the next adjacent letter is aligned with marker **113** (i.e., after 60° of rotation). In at least some embodiments the ratchet mechanism includes one or more dimples or recessions **128** arranged on top surface **118** so as not to interfere with keyway **124**. The dimples are arranged to correspond to indicia **116**, so if there are 26 markers uniformly spaced on tumbler **114** there may be 26 matching dimples. The top surface of bottom spacer **112** also includes recessions **128**.

[**0091**] Referring to **FIGS. 4 and 5**, bottom surface **120** has one or more rounded bumps or raised members **129**, sized to rest in recessions **128** and therefore arranged an equal distance from the center axis of the tumbler **114** as are recessions **128**. The bottom of top spacer **110** similarly includes one or more matching raised members **129**. Other forms of ratchet mechanisms are envisioned such as springs, brackets, and wires that are common in the prior art which may bear upon the tumblers external surface **117** or internal surface **122**.

[**0092**] Referring to **FIGS. 2, 5** and **6**, linear key **84** as shown has a generally circular cross section sized to pass through opening **123** of the tumblers **114** when the tumblers are stacked. In some embodiments, key **84** may have a multi-surface (e.g., polygon) cross section. Key **84** includes a head member **132** and an elongated shaft member **134**. The underside **136** of head member **132** is arranged as explained below. A series of key couplers or projecting pins **140** are spaced along the length of shaft member **134** to align with the tumbler openings **126** when the tumblers **114** are stacked and key **84** is received therein.

[**0093**] An alignment pin **154** extends from head member **132** in the same direction as shaft member **134** and is spaced apart from shaft **134** to be aligned with, and is sized to be received within, hole **157**, when shaft member **134** is received and passes through opening **150**. Pin **154** and hole **157** cooperate to restrict/prevent rotation of key **84** with respect to top section **102**. Other methods of preventing key **84** from rotating are contemplated such as rotation restrictors, gear teeth, flanges, or first and second stop surfaces in lock **82** and key **84** that interact with each other to prevent rotation of key **84**.

[**0094**] Referring to **FIG. 2**, in at least some embodiments, a message retainer **160** may be provided on an external surface of key shaft member **134** via which a message **162** can be provided. Here, the retainer could include a see-through plastic sleeve for receiving a small sheet of paper or, may simply be embodied in a sticker or label **160** on which message **162** is printed. In some embodiments, retainer **160** may include an electronic display such as an LCD indicator. Moreover, in some cases, retainer **160** my include a small audio speaker for, when key **84** is removed from other assembly components, broadcasting an audible message. In

any event, the information retained by retainer **160**, is only accessible when key **84** is removed from the assembly channel **360**.

[**0095**] Referring to **FIG. 6**, in some embodiments, a retainer compartment **164** may be provided within shaft member **134**. In the illustrated embodiment, compartment **164** is accessible via the distal end of member **134**. In other embodiments, it is contemplated that an opening may be formed through a side surface of member **134** and a compartment door (not illustrated) may be provided to cover the compartment. Compartment **164** could be provided or formed by other assembly components such as one of the tumblers, one of the top or bottom sections **110**, **112** (see **164***e* in **FIG. 17**), etc. In any event, compartment **164** is only accessible when key **84** is removed from assembly channel **360**.

[**0096**] Shaft **134** is receivable within channel **360** so that each tumbler coupler is matched to a key coupler, forming a coupler pair. To insert key **84** into the stack, keyways **124** of each tumbler are oriented so as to be in a line so projecting pins **140** can pass through the keyways **124** and so alignment pin **154** can enter hole **157**. Keyways **152** and/or **156** must also be aligned with keyways **124**. To prevent key **84** from moving laterally, countersunk hole or opening **158** in bottom section **104** is provided and receives the distal end of shaft member **134**. The position of the external markings or indicia **116** for each tumbler **114** relative to alignment markers **113** when the keyways are aligned corresponds to the secret code or answer word **88** that is used to unlock lock **82**.

[**0097**] When key **84** is fully inserted, underside **136** of head member **132** completely covers opening **150** and keyway **152** so that it is not possible to peer into lock **82** to discern the positions of the keyways **124**. In some cases head member **132** is arranged so as to cover any mating devices **108** (see **FIGS. 16 and 17**).

[**0098**] To lock Cryptex **80**, with shaft **134** received in channel **360** one or more of the tumblers **14** are rotated. Openings **126** of each tumbler **114** are sufficiently sized that pins therein can pass when the tumbler is rotated. When locked, key **84** cannot be removed from lock **82** as one or more pins **140** are blocked by tumblers **114** whose keyways or gaps **124** are not axially aligned with associated pins. When locked, answer word **88** is not obvious to the recipient.

[**0099**] When Cryptex **80** is assembled and locked and when ratchet recessions **128** and raised members **129** are used, just enough room is provided between top section **102** and bottom section **104** so that one tumbler **114** at a time can be rotated with respect to adjacent tumblers. When one tumbler **114** is rotated, the recessions **128** and raised members **129** of the rotating tumbler **114** and a tumblers **114** (or top spacer **110** or bottom spacer **112**) adjacent the rotating tumbler disengage until the tumbler **114** is rotated enough to allow the recessions **128** and raised members **129** to again align. Once the recessions and raised members re-align, the raised members snap or spring into the next set of recessions **128** of the adjacent tumblers **114**.

[**0100**] When lock **82** is unlocked and key **84** is removed, the message associated with indicator or retainer **160** is accessible or provided. The secret message can be another puzzle or mystery (e.g. a puzzle that, when solved, informs the recipient of the location of a gift). However, the message may be a simple text statement and not a puzzle. In some cases a physical item, object or gift (e.g. bracelet, money, gift certificate, or candy) may be hidden inside chamber or compartment **164** (see **FIG. 6**) that is only accessible or visible when Cryptex **80** is unlocked and key **84** is removed from channel **360**.

[**0101**] Alternate Cryptex Embodiment

[**0102**] **FIGS. 26 and 27** show an alternate Cryptex embodiment **80***a*. In **FIGS. 26 and 27** components that are similar to the components described above are identified by similar numbers followed by a lower case "a". For example, the key in **FIGS. 26 and 27**, is identified by label **84***a*. Because many of the elements in **FIGS. 26 and 27** are similar to the elements described above, while the elements are similarly labeled in the figures, they are not described again here in detail and instead the specification above should be referred to for specifics. Shaft **134***a* of key **84***a* includes a series of collars **166***a* spaced along shaft **134***a* equal in number to the number of tumblers **114***a*. Collars **166***a* form key couplers. Keyways **124***a* re cut into collar **166***a*. Each tumbler has a pin **140***a* inserted into an opening **168***a*, defining a tumbler coupler. When shaft **134***a* is inserted into tumblers **114***a* through tumbler openings **126***a*, each pin **140***a* is positioned slightly above a corresponding collar **166***a* forming a coupler pair. By rotating any tumbler **114***a*, shaft **134***a* is retained within the tumbler channel. Thus, in the case of Cryptex **84***a*, pins **140***a* extend from tumblers **114***a* instead of from key **84***a* and collars **124***a* are formed by key **84***a* instead of by tumblers **114***a*.

[**0103**] Alternate Tumbler Design

[**0104**] The alignment of tumblers to unlock a Cryptex can be established and fixed when the Cryptex is manufactured. However, in some instances, it will be desirable for a purchaser of a Cryptex to be able to change the unlocking alignment of the tumblers so that the answer word **88** associated with the Cryptex can be altered. To accomplish this task, a modifiable tumbler configuration is contemplated wherein the relative juxtaposition between the tumbler coupler (e.g., the gap) and the indicia on the external surface of the tumbler is alterable.

[**0105**] Referring still to **FIGS. 26 and 27**, in at least some embodiments, two or more holes like hole **168***a* may be provided in each tumbler **114***a* for receiving pin **140***a*. For instance, where eight letters are provided on the external surface of each tumbler, each tumbler may form eight holes, a separate hold associated with and aligned with a separate one of the letters. Here, for example, if a current answer word is "delay" and a Cryptex user desires to change the answer word to "relay", the user may disassemble devices **108***a*, remove top section **102***a* spacer **110***a* and top tumbler **114***a*, remove the pin **140***a* from the hole **168***a* associated with letter "d", place pin **140***a* in the hole **168***a* associated with letter "r" and then reassemble the components thereby changing the answer word.

[**0106**] Another modifiable tumbler **114***b* configuration is illustrated in **FIGS. 7-10**. Tumbler **14***b* is meant to be used with other assembly components described above which will not be described again here in detail. In **FIGS. 7-10**, features akin to features described above are identified by similar numbers followed by a lower case "b".

[0107] Referring to **FIGS. 7-10**, modifiable tumbler **114***b* includes an external tumbler member **170***b* and an internal tumbler member **172***b*. External member **170***b* forms external surface **116***b*, includes top and bottom surfaces that form recesses **128***b* and bumps **129***b* and forms an external surface **175***b* that includes a plurality of flat surfaces that together define an opening **174***b*.

[0108] Internal member **172***b* includes an external surface **178***b*, an internal surface **125***b* and top and bottom surfaces that are not labeled. External surface **178***b* is shaped to mirror and to mate with internal surface **175***b* of external member **170***b* in any of several different orientations where surfaces **175***b* and **178***b* restrict rotation of member **172***b* with respect to member **170***b* in each of the different orientations. For instance, as illustrated, each of internal surface **175***b* and external surface **178***b* may include ten flat subsurfaces displaced about a central axis so that ten different relative orientations are possible. Internal surface **125***b* forms a collar and gap **124***b* akin to the similar components illustrated in **FIGS. 3-6**. Here, the indicia on external surface **116***b* is aligned with the flat surfaces that form opening **174** so that, as relative orientation of members **170***b* and **172***b* is altered, relative juxtaposition of the indicia and tumbler coupler **124***b* is altered. Thus, for instance, consistent with the above example, internal member **172***b* may be removed from external member **170***b*, rotated and replaced within member **170***b* in a second relative orientation to change a "d" to an "r" in an answer word.

[0109] **FIGS. 11 and 12** show one additional tumbler configuration that is modifiable or adjustable to change relative juxtaposition between indicia and tumbler couplers. In **FIGS. 11 and 12**, features similar to those described above are identified by the same number followed by a lower case "c". In **FIGS. 11 and 12**, instead of forming multi-side surfaces, external tumbler member **170***c* has gear teeth **179***c* cut into internal wall **176***c* and internal tumbler member **172***c* has at least some matching gear teeth **180***c* cut into exterior wall **178***c*. The number of teeth is equal to the number of external indicia **116***c* and are positioned to align with indicia **116***c* of tumbler **114***c*. As above, the external tumbler member **170***c* and internal tumbler member **172***c* can be reassembled so that keyway **124***c* is alignable with any desired external indicia **116***c*.

[0110] Referring to FIGS. **13** to **15**, one additional modifiable tumbler configuration **114***d* is illustrated where features similar to those described above are identified via the same number followed by a lower case "d". In **FIGS. 13-15**, tumbler **114***d* includes an exterior channel **181***d* with overhangs **183***d* on the upper surface **118***d* and lower surface **120***d* into which is placed a removable marking strip **184***d*. Removable marking strip **184***d* can be inserted into channel **181***d* by inserting one end thereof into opening or slot **185***d* in overhang **183***d* and pushing until strip **184***d* generally covers external wall **117***d* of tumbler **114***d*. Slot **185***d* is cut in each tumbler so that slot **185***d* is randomly aligned with keyway **124***d* so that the position of keyway **124***d* cannot be guessed from the position of slot **185***d*.

[0111] Removable marking strip **184***d* is shown in **FIG. 15** as a piece of paper printed on a conventional printer (e.g. a laser or ink jet printer). Strip **184***d* has indicia **116***d* printed in any order although they should not be duplicated. Optional fold marks **186** help position removable marker strip **184***d* in channel **181***d*. By printing removable marker strip **184***d* it is possible to vary the marker that is aligned with keyway **124***d* for each tumbler allowing any answer word to be used to unlock the lock. Other methods to alter indicia **116***d* on external wall **117***d* of tumbler **114***d* are contemplated (e.g., individual adhesive letters and heat shrinkable bands, etc.).

[0112] Tumblers Combined with Spacers

[0113] In at least some embodiments it is contemplated that stationary spacers may be provided between adjacent tumblers. To this end, an exemplary Cryptex configuration **80***e* is illustrated in **FIGS. 16 and 17**, where components/features similar to those described above are identified by similar numbers followed by a lower case "e". Cryptex **80***e* is constructed so that tumblers **114***e* do not need openings **126***e*. Instead each tumbler **114***e* is separated by spacers **187** which have a thickness at least as large as the width of one of the projecting pins **140***e*. Spacers **187***e* are fixed (e.g., attached to one or more of connectors **106***e* or alternately to top **102***e* or bottom **104***e*). Spacers **187***e* also have a central hole or opening and keyway **188***e* aligned with opening **150** and keyway **152***e* of top **102***e* so shaft **134***e* can pass through the spacers when lock **82***e* is unlocked. Spacers **187***e* can also have dimples on their top surfaces and/or raised members **129***e* on their bottom surfaces as part of a ratchet mechanism to mate with recessions **128***e* and raised members **129***e* of tumblers **114***e*.

[0114] Varying Answer Word Length

[0115] In at lease some embodiments, it is contemplated that a Cryptex user may want to use a Cryptex with answer words having more than a single length (e.g., one time an answer word may include 5 characters and a following time the word may include 7 characters). Here, the present invention contemplates several mechanical solutions for altering the length or at least the effective length of an answer word. First, referring again to **FIGS. 16 and 17**, in at least some embodiments, it is contemplated that one or more tumblers **114***e*, spacers **187***e* and members **106***e* may be removed from or added to a Cryptex assembly by taking the assembly components apart and re-assembling the components in some other fashion. Here, member **106***e* may have alterable lengths, may include removable sections or may be swappable for other members **106***e* having different lengths so that variable sized stacks can be accommodated.

[0116] When the number of tumblers is altered, the key length must likewise be modified. To this end, referring to **FIGS. 17 and 18**, an exemplary key **84***e* having a modifiable length is illustrated. In **FIGS. 17 and 18**, shaft **134***e* has a relatively short length (e.g., long enough for a lock **82***e* of three tumblers **114***e*). Additional shaft members or segments **195***e*, each with a pin **140***e*, can be added to member **134***e* to increase the combined length. Optionally, an end piece **196***e* can be added to complete shaft **134***e*. In this manner, the total length of shaft **134***e* can be adjusted to accommodate as many tumblers as desired. As indicated above, connectors **106***e* must similarly be adjusted for length as well. For example, connectors **106***e* may be composed of separate segments that screw together so that length is adjustable.

[0117] Second, in some embodiments, end tumblers may be lockable so that they do not rotate about the tumbler axis,

thereby reducing the effective length of the answer word. To this end, referring again to **FIGS. 16 and 17**, in at least some embodiments, a hole **191***e* may be formed in one or more of the spacers **187***e* for receiving a locking pin or restraining mechanism **190***e*. Here, a similar hole **193***e* is formed in each tumbler adjacent one of the spacers **187***e* that forms a hole **191***e*. The holes **191***e* and **193***e* are provided such that when a pin **190***e* is received in both, the pin **190***e* restrains movement of the tumbler and so that a blank space is aligned with alignment markers **113***e*. Thus, to reduce answer word length by one character, one pin **190***e* may be used to restrain rotation of one tumbler **114***e*.

[**0118**] Shaft segments **195***e* and end piece **196***e* must be connected to each other so they do not separate due to twisting or when key **84***e* is pulled or pushed. One method of connecting segments **195***e* and end piece **196***e* together is to place a horizontal male dovetail at the top of each segment that mates with a horizontal female dovetail in shaft **134***e* or an adjacent segment **195***e*. Other methods of attaching segment **195***e* and shaft **134***e* are anticipated such as screws, pins, glue, etc.

[**0119**] When adding or removing tumblers **114***e*, it may also be necessary to lengthen, shorten, or replace connectors **106***e*. This may be expedited when individual spacers **187***e* are used with individual connectors **106**, so they can be added as sets for every tumbler **114***e* added (see **FIG. 16**).

[**0120**] Tumbler Grain Matching

[**0121**] **FIG. 28** shows tumblers **114***a* and spacers **110***a*, **112***a* that have been cut from a single piece of wood, grained stone, or variegated plastic. In this case a matching set of grain patterns **198***a* is visible. It is preferred that when the grain pattern **198***a* matches the tumblers **114***a* are in a locked alignment and when the tumblers **114***a* are in the unlocked alignment (e.g. see **FIG. 29**), at least some of the grain **198***a* patterns are not matched. Generally, most or none of the grain patterns **198***a* will match when tumblers **114***a* are in the unlocked alignment.

[**0122**] Electronic Embodiments

[**0123**] **FIGS. 19 and 20** show an electronic version of a Cryptex assembly **80***f* where components similar to the components described above are identified by similar numbers followed by a lower case "f".

[**0124**] Externally, Cryptex **80***f* has an appearance that is similar to the previous embodiments. To prevent accidental removal of key **84***f* from the channel formed by tumblers **114***f*, a latching mechanism **200***f* is provided. In one embodiment, latching mechanism **200***f* is part of head member **132***f* of key **84***f* and consists of a button **202***f* connected to a latch **203***f*. Button **202***f* and latch **203***f* are forcibly extended by spring **204***f*. When key **84***f*, is placed in lock **82***f* latch **203***f* is pressed into recess **206***f* of top section **102***f*. Key **84***f* can only be removed when button **202***f* is depressed to disengage latch **203***f* from recess **206***f*. Other means of securing or latching key **84***f* to lock **82***f* are anticipated including without limitation snaps, friction, bolts, screws, pins, tape, wedges, etc.

[**0125**] Key **84***f* includes an internal space **208***f* that houses a circuit board **210***f* and no longer includes pins **140**. Circuit board **210***f* is used to arrange the electronic components show in **FIG. 22** which include processor **250***f* and memory **251***f* linked to a power source **252***f* (e.g. battery or solar cell mounted to head member **132**), a tumbler alignment sensor **256***f*, a key removal sensor **254***f*, an indicator **160***f* (e.g. a LCD or speaker), a timer **260***f*, a communication port **262***f*, and, when desired, a disassembly sensor **264***f*. Memory **251***f* is used to store information which may consist of an answer word(s), a word puzzle(s), hints, clues, message(s), or other data.

[**0126**] When key **84***f* is inserted into lock **82***f*, key removal sensor **254***f* detects that the key is in the lock channel. This can be done by passing a current between contacts **212***f* and **214***f* and fixed contacts **220***f* and **222***f* of top **102***f* or spacer **110***f*. When there is a closed circuit, key **84***f* is in the channel. Key removal sensor **254***f* can instead be linked to latching mechanism **200***f* so that it is activated when latch **203***f* is retracted allowing key **84***f* to be removed.

[**0127**] Tumbler alignment sensor **256***f* can be constructed using a fixed contact **220***f* which is further linked to conductor **232***f* that goes to one of raised members **129** of spacer **110***f*. Each tumbler **114***f* also has a single conductor **236***f* between one recession **128***f* and a raised member **129***f* there below. Finally, another fixed conductor **236***f* is placed in one dimple of bottom spacer **12***f*. Conductor **236***f* terminates at contact **238***f*. When key **84***f* is in the channel contact **240***f* is in electrical contact with contact **238***f*.

[**0128**] Fixed conductors **232***f* and **236***f* are aligned so that they are in a direct vertical line above each other. The conductors **234***f* of tumblers **114***f* are arranged so that when the tumblers **114***f* are in any locked position, the tumblers are not all making contact with each other or with conductors **232***f* and **236***f*. Only when tumblers **114***f* are aligned in the unlocked position is a circuit made between contracts **212***f* and **220***f*, conductor **232***f*, conductors **234***f*, conductor **236***f*, and contacts **238***f* and **240***f*, together acting as an alignment sensor **256***f*, through processor **250***f*.

[**0129**] When lock **82***f* is unlocked, processor **250***f* detects the unlocked condition and sets an electronic unlock flag. When any of the tumblers **114***f* are moved, processor **250***f* unsets the unlock flag. When key **84***f* is removed from lock **82***f*, processor **250***f* detects the removal and checks the unlock flag. When the flag is set, processor **250***f* activates indicator **160***f* to present a secret message. When the flag is not set, the processor **250***f* does not activate the indicator **160***f* or uses it to present a message indicating tumblers **114***f* were not aligned so as to unlock lock **82***f*. Processor **250***f*, in this case, may then activate timer **260***f* to force a time delay before another key **84***f* removal will result in the indicator **160***f* being activated. For example it may be desired after key **84***f* has been removed once prior to using the tumblers to indicate the correct answer word, that the user must wait for 10 minutes before the next removal will be checked to determine if lock **82***f* is unlocked. Key **84***f* removal prior to 10 minutes can result in indicator **160***f* presenting a message that more time must pass before unlocking will be detected. Various timing strategies are anticipated, such as lengthening or shortening the time before the next unlock attempt will be validated.

[**0130**] It is further anticipated that key **84***f* can be extended as described above where shaft segments and an end piece can be added so as to maintain the conductive path described for alignment sensor **256***f* (see again **FIGS. 17 and 18**).

[0131] In at least some embodiments it is contemplated that the secret message presented via indicator **160***f* may be programmed by a separate computer (e.g. a personal computer, cell phone, or PDA) that has a communication port compatible with key communication port **262***f* (not separately shown in **FIGS. 18 and 19** but may use contacts **212***f*, **214***f* and/or **240***f*) such as USB or Bluetooth. Here, entering the secret message in the separate computer and communicating it to processor **250***f* and memory **251***f* will cause the processor to store the message.

[0132] In some cases processor **250***f*, power source **252***f*, indicator **160***f*, and other components of circuit board **210***f* may be part of lock **82***f* instead of key **84***f*, for example see indicator **160***f* in **FIG. 23**.

[0133] In some cases it may be desirable to place an additional disassembly sensor **264***f* in key **84***f*. Referring again to **FIGS. 19 and 20**, one version of this is to place contacts **242***f* and **243***f* at the bottom of shaft **134***f* that make contact with a conductive plate **244***f* located within the recess formed by bottom section **104***f*. Attempts to disassemble lock **82***f* when key **84***f* is in the lock can be detected by sensor **264***f* no longer presenting a closed circuit to processor **250***f* when removal sensor **254***f* indicates key **84***f* is still in lock **82***f*. When this happens, processor **250***f* may delete the secret message.

[0134] While conductors **236***f* are shown placed between a recession **128***f* and a raised member **129***f* of tumbler **114***f*, the conductors can be placed elsewhere and no ratchet mechanism need be provided. Furthermore it is anticipated that other sensors can be used by key **84***f* to determine when tumblers **114***f* have be placed in the unlocked position (e.g. by using a sensor along key **84***f* for each tumbler **114***f*). The sensors need not use contacts and, instead, can be magnetic, optical, or other non-contact sensors.

[0135] It is also anticipated that other type of sensing technology can be used for removal sensor **254**, alignment sensor **256**, and disassembly sensor **264** other than electrically conductive sensors. Other sensors include, without limitation, optics, fiber optics, buttons, switches, resistors, capacitors, and magnets.

[0136] As in the case of the mechanical Cryptex assemblies described above, in some cases it may be desirable to alter a Cryptex answer words. Referring now to **FIG. 21**, an exemplary alternate electronic tumbler and key configuration **80***g* includes a separate tumbler position sensor **268***b* for each tumbler where each tumbler **114***g* includes a separate resistor **270***g* for each separate mark or indicia **116***f* on external surface **117***g*. Each of the resistors **270***g* has a resistance value that is unique to the specific tumbler **114***g* and is aligned so that when an associated indicia or mark on surface **117***g* is aligned with one of the alignment markers (see again **113** in **FIG. 1**), sensor **268***g* can sense the resistance value and hence processor **250***f* can identify the position of the tumbler **114***g*.

[0137] When key **84***g* is in channel **360***g* processor **250***g* is placed in a programming mode by programming activator **272***g* which may be an external button or a radio receiver. When the programming activator is activated (e.g., pressing a button or receiving a programming radio signal), processor **250***g* senses the resistance value for each tumbler **114***f* using tumbler position sensor **266***g* and places the value in memory **251***g*. During subsequent use, processor **250***g* determines that lock **82***g* is unlocked when the same resistance values are measured for each tumbler **114***g* as stored in memory **251***g* and sets the unlock flag. Any other resistance values correspond to a locked position.

[0138] Tumbler position sensor **266***g* can sense other physical traits beside resistance, for example capacitance or reflected light color.

[0139] When the resistance values corresponding to each indicia **116***g* are known, processor **250***g* can be programmed when key **84***g* is not in lock **82***g*. Programming activator **272***g* may include communication port **262***g* in the form of a linking device or connector (e.g., a USB connector) linked to processor **250***g* or via a radio frequency link (e.g. Bluetooth or 802.11b). Communication port **262***g* receives a programming signal from an external computer using a second linking device (e.g., a matching USB connector or radio frequency link) with the resistance values for each tumbler **114***g* and sends it to processor **250***g* to store in memory **251***g*. In this manner the sequence of markings that are used to unlock lock **82***f* can readily be provided by external programming as discussed in additional detail below.

[0140] Referring again to **FIGS. 19, 20** and **22**, where an electronic version of the Cryptex **80***f* includes a compartment (e.g., 164 in previous embodiments), processor **250***f* can also be linked to a compartment locking mechanism **274***f* which is used to secure or block access to the compartment. Processor **250***f* releases compartment lock **274***f* when lock **82***f* is unlocked and key **84***f* is removed and allows access to the compartment so any object, message or gift can be removed. When key **84***f* is removed and lock **82***f* is in a locked position, compartment lock **274***f* is used to secure the compartment. Compartment lock **274***f* can be used instead of indicator **160***f* or with indicator **160***f*.

[0141] Compartment lock **274***f* can follow the same rules described above for activating indicator **160***f*. That is, if key **84***f* is removed when lock **82***f* is locked, compartment lock **274***f* can remain secured for a period of time (e.g. 1 hour) before it can be attempted to be unlocked again. When key **84***f* is removed and lock **82***f* is in the unlocked position, compartment lock **274***f* may be deactivated allowing access to the compartment. In some cases, compartment lock **274***f* is arranged to prevent key **84***f* from being removed from lock **82***f* until tumblers **114***f* are in the unlocked position.

[0142] Cryptex **80***f* can also provide additional hints, clue(s), or word puzzles to assist in discovering the answer word. A clue can either be a new word puzzle or can be a descriptor of the answer word (e.g. "it starts with a S", "it isn't a rock"). Clues can be presented using indicator **160***f* when the indicator is visible or audible outside of Cryptex **80***f*. For example, the word puzzles can be presented over a period of time or vary by the number of attempted removals of key **84***f* from lock **82***f*.

[0143] Referring again to **FIG. 21**, where a Cryptex answer word can be altered electronically, it is possible to use the Cryptex **80***g* to play more complicated multi-answer games where a recipient must answer multiple word puzzles, each with a separate answer word, to gain access to a compartment or to have a message presented. In this case, the answer words may be stored in a key memory and

Cryptex **80***g* must be unlocked by rotating tumblers **114***g* to a specific alignment orientation with the alignment markers so that indicia **116***g* spell each answer word in succession. Presumably, each word puzzle is presented to the user in succession, (e.g., as a series or cards sent or provided over time).

[**0144**] Word puzzles can also be stored in a key memory and can be presented using an externally mounted indicator where the process of presenting word puzzles can be understood by a person who has not unlocked the Cryptex or removed the key. This can be done by using a display **160***h* that is mounted on the exterior of a Cryptex as seen in **FIG. 23** or by using a speaker that can be heard outside of the Cryptex. When desired, more than one indicator can be provided. For each word puzzle, additional clues can be stored in the key memory and provided should additional assistance be required to discover the corresponding answer word.

[**0145**] Cryptex Purchasing

[**0146**] It is anticipated that one particularly useful way to sell Cryptex will be at a store as part of a novelty item or gift set **300**. To this end, an exemplary gift set **300** is illustrated in **FIG. 23**. Set **300** includes a box **302**, a card **90**, a Cryptex **80** and a second card **88**. Here, it is contemplated that cards **90** and **88** and Cryptex **80** will, in at least some cases, be placed within box **302** for sale. The exterior of box **302** may be printed with an explanation **310** which explains the operation and purpose of gift set **300**. the exterior may also include a display of word puzzle **86** corresponding to the associated Cryptex **80** so a purchaser can determine if the word puzzle **86** is one they or an intended recipient will like. Answer word **88** can also be displayed, but this is not required. Where answer word **88** is presented, the presentation will give a purchaser a clear idea how difficult it might be to solve the word puzzle **86** and appropriateness of giving the Cryptex **80** to a specific recipient.

[**0147**] Greeting card **90** can have a printed exterior greeting message **312** and/or graphic image **313** and/or an interior greeting message **314** as well as the word puzzle **86**. When desired, card **90** will also include an Internet address **316** (e.g., printed on the back of card **90**) where additional clues, hints or puzzle questions can be found related to answer word **88** for the specific Cryptex **80**. This can be of great help when the recipient cannot solve the puzzle question and unlock Cryptex **80**. The additional clues or hints can be provided as a single web page or as a series of hints that change over time so that more assistance is available but not all at once. This can also be done by changing the hint each time the person uses a browser to get a hint by using a cookie to determine the number and time of visits. Furthermore, a timer may be used to prevent the person from getting all of the hints too quickly (e.g., one per day). Additional hints can be printed and provided in box **302** and given to the recipient over time at the discretion of the purchaser/giver. Graphic image **313** can also relate to word puzzle **86** and answer word **88**. For example, in some cases, answer word **88** can be an object either in or in some cases missing from image **313**.

[**0148**] When Cryptex **80** and card **90** are given to a recipient, the purchaser/giver retains the printed answer card **308**. In some cases, printed answer card **308** is not provided and answer word **88** is not printed on box **302**. In this case, Cryptex **80** is unlocked only via solving word puzzle **86**, with or without Internet provided hints.

[**0149**] While set **300** includes box **302**, it is anticipated that set **300** may not include box **302**. For example, a blister pack, bag, or other means may be provided to keep Cryptex **80**, greeting card **90** and printed answer card **308** (when provided) from being separated before purchase.

[**0150**] Cryptex **80**, when equipped with tumblers **114** that allow the alignment of keyway **124** to be changed, can also be purchased without the remaining parts of set **300**. In this case, the purchaser will provide a greeting card of their own, for example, with the word puzzle **86** created and printed by the purchaser and the answer word **88** being a secret to the purchaser. By modifying the alignment of keyways **124** in tumblers **114**, Cryptex **80** can be unlocked using the purchaser's self chosen answer word **88**. As previously described, Cryptex **80** can have one or more lower tumblers **114** restrained to accommodate short answer words **88** or tumblers can be added or removed from lock **82** and segments **195** to key **84** to accommodate answer words of various lengths.

[**0151**] In other cases where Cryptex **80** can be modified by a purchaser to accommodate different answer words **88**, greeting card **90** with printed word puzzle **86** and matching printed answer card **308** can be purchased together, but separate from Cryptex **80**. The purchaser then rearranges keyways **124** so that when external indicia **116** match the answer word **88**, key **84** can be removed from lock **82**.

[**0152**] In some cases, set **300** is comprised only of Cryptex **80**, which can be reprogrammed, and greeting card **90**, which is blank. In this case, lock **82** and key **84** may be separated or the markings lined up to a default unlocked setting (e.g., all "A" characters). The purchaser creates their own word puzzle **86** and answer word **88**. The purchaser programs lock **82** so that tumblers **114** are in the unlocked position when the selected answer word **88** is aligned with markers **113**. The user uses a retail self service station or kiosk or their own computer with a user interface or display **320**, a selection indicator (e.g. a mouse, keyboard, or voice recognizer) and a printer to print a word puzzle **86** and any other greeting or image **313** on card **90**. The computer can also be used to program a hidden message via a processor to be displayed via an indicator. The retailer kiosk can also provide the user with choices of greeting messages **312** or **314** and images **313**.

[**0153**] It is possible to purchase greeting card **90** via an Internet commerce site. This site can display a list of word puzzles **86** on a computer interface or display **320** as shown in **FIGS. 24 and 25**. The purchaser can select to purchase (by selecting button **324** with a computer pointing device) word puzzle **86** as part of a greeting card **90** or go to the next (by selecting button **326**) or previous (button **328**) choices. Once selected for purchase, the corresponding answer word **88** is displayed and appropriate funds are transferred to the selling Internet commerce site. The purchaser can be provided with additional selections to customize greeting card **90** with additional information (e.g., a specific message, greeting, and name(s)). By selecting print button **332**, the greeting card **90** with any customized messages and the selected word puzzle **86** is printed out. The purchaser retains the answer word **88** and rearranges keyways **124** so that the answer word **88** will unlock lock **82**. When Cryptex **80**

includes a processor (see **250***g* in **FIG. 21**), separate tumbler position sensors **268***g*, and a communication port **262***g* the arrangement of the indicia **116***g* on the tumblers **114***g* that unlock lock **82***g* can be downloaded or received from an Internet connected computer. This allows the answer word to be selected or purchased and downloaded for transmission to processor **250***g* for storage by communication port **262***g* (e.g. a USB connector or radio frequency link).

[**0154**] In this case tumblers **114***g* can be considered to be an input device and communication port **262***g* can be considered an answer word setting device when used with an external computer and interface **320***g*.

[**0155**] It is also possible to let the user select the answer word **88** first for purchase and then display an associated word puzzle **86**. In either case, the purchaser is not shown both word puzzle **86** and answer word **88** prior to purchasing the combination.

[**0156**] Varying Tumbler Arrangement For a Specific Answer Word

[**0157**] When individual tumblers can be added or removed, when tumblers can be restrained from rotating (e.g. using pin **190**), or a tumbler is composed of an external member and an internal member, instructions can be provided to assist in modifying a Cryptex **80** based on a specific answer word that is selected. For example, referring again to **FIGS. 7-10**, outer external member **170***b* can be provided in a ten sided format with 10 letters. In this case, the 26 characters of the alphabet plus the space character can be deployed on three different tumblers **114***b*. For example one tumbler **114***b* may have the 10 least used letters of the English language appearing on it, while the other two would have the remaining letters. By providing only one tumbler **114***b* with the least used letters and a small selection of the other tumblers (e.g. three of each of the other tumblers), almost any seven letter answer word can be created with a Cryptex.

[**0158**] To modify the Cryptex answer word, a specific answer word is selected (e.g., at a retailer Kiosk or using an internet browser). Software then determines an arrangement of the external member **170***b* versus the internal member **172***b* for each tumbler **114***b*, so that when the tumblers **114***b* are arranged with the answer word aligned with alignment marks **113***b*, the Cryptex is unlocked. This can be aided by placing a different numeric designation on each or the four different tumblers **114***b*. The instructions can then indicate that the tumblers are to be stacked in an order corresponding to tumbler numeric designations 3, 2, 2, 1, 1, 2, 1.

[**0159**] As a further aid, external member **170***b* can have a numeric designation imprinted on its top surface **118***b* corresponding to each indicia **116***b*. By further designating this number, an inner piece can be rotated or positioned so that keyway **124***b* is aligned with a specific one of the numbers on the external member and hence with a specific one of the letters. The instructions to configure a Cryptex **80***b* that unlocks using a selected answer word would then appear as instructions to arrange external members **170** and internal members **172** in the following order. 3-5, 2-7, 2-1, 4-4, 1-6, 2-8,1-4, where the first number indicates one of the three different tumbler types and the second number in each pair indicates how the inner and outer members should be aligned.

[**0160**] In some cases the instructions may include information to pin or restrain a specific tumbler so that it cannot rotate. In other cases the instructions may indicate specific tumblers that should be purchased to build a Cryptex **80** that unlocks using a specific answer word. Purchasing of additional tumblers may be essential when tumblers are not composed of external members and internal members or otherwise adjustable.

[**0161**] In some cases, tumblers **114** are selected so that, when arranged in a specified order, they can be aligned with alignment marker **113** to spell a large variety of English or other words even if the words are not the specific answer word that could unlock the assembly. In some cases the words are selected so they could also be possible, but not perfect or intended, solutions to an associated word puzzle.

[**0162**] While the invention may be susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and have been described in detail herein. However, it should be understood that the invention is not intended to be limited to the particular forms disclosed. For example, in some cases alignment pin **154** and hole **157** may not be required. In addition, in some cases marks **113** may not be provided

[**0163**] Thus, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the following appended claims.

[**0164**] To apprise the public of the scope of this invention, the following claims are made:

What is claimed is:

1. An apparatus for concealing at least one of an item and a message that is obtainable by opening the apparatus via manipulation of the apparatus, the apparatus comprising:

a plurality of tumblers including at least one end tumbler and a sub-set of additional tumblers, each tumbler including first and second oppositely facing surfaces, an external surface between the first and second oppositely facing surfaces and indicia on the external surface, at least the sub-set of additional tumblers including an internal surface that forms an opening that extends from the first surface to the second surface of the tumbler along a tumbler axis, the end tumbler forming at least an opening in the first surface, each tumbler also including at least one tumbler coupler, the tumblers stackable with the end tumbler at one end of the stack and the first surfaces facing second surfaces of adjacent tumblers such that the tumbler openings are aligned to form a channel wherein each of the tumblers is rotatable about the tumbler axis to modify the indicia on the external surface that is aligned along an alignment axis parallel to the tumbler axis;

a key including an elongated shaft member and at least one separate key coupler for each of the tumblers in the plurality, the key couplers spaced along the shaft member such that each key coupler is proximate an adjacent one of the tumbler couplers when the shaft member is received within the channel, each proximate tumbler coupler and key coupler forming a coupler pair;

wherein, the key is moveable along the tumbler axis when the key couplers and tumbler couplers are aligned and

a portion of the apparatus including at least one of an item retainer and a message retainer; and

wherein, at least one of the tumblers is an adjustable tumbler that includes an external tumbler member and an internal tumbler member, the external tumbler member forming the external surface and also including a first inwardly facing non-cylindrical intermediate surface, the internal tumbler member forming the internal surface and also including a second outwardly facing non-cylindrical intermediate surface, the first intermediate surface configured to receive the second intermediate surface in at least first and second relative juxtapositions such that tumbler coupler and indicia are in at least first and second relative orientations such that the at least one adjustable tumbler can be manipulated to alter the position of the indicia on the external surface relative to the tumbler coupler formed by the adjustable tumbler.

2. The apparatus of claim 1 wherein a first coupler in each coupler pair includes a pin and a second coupler in each coupler pair includes a ridge that forms at least one gap, the key moveable along the tumbler axis when the pin and gap of each coupler pair is aligned and blocked from movement along the tumbler axis when at least one of the pins and gaps is misaligned.

3. The apparatus of claim 2 wherein the indicia on each external surface includes N different characters.

4. The apparatus of claim 3 wherein the first intermediate surface is configured to receive the second intermediate surface in at least N relative juxtapositions such that the gap and indicia are positionable in at least first though Nth different relative orientations.

5. The apparatus of claim 4 wherein N is between four and twenty-seven.

6. The apparatus of claim 5 wherein N is eight.

7. The apparatus of claim 4 wherein the first intermediate surface includes N sides that are substantially radially aligned with the N different characters and wherein the second intermediate surface substantially mirrors the first intermediate surface.

8. The apparatus of claim 1 wherein each of the tumblers is an adjustable tumbler.

9. The apparatus of claim 1 wherein the first surfaces of tumblers contact the second surfaces of adjacent tumblers.

10. The apparatus of claim 9 wherein each of at least a subset of the first surfaces of the tumblers forms one of a recession and a raised member and each of at least a subset of the second surfaces of the tumblers forms the other of a recession and a raised member and wherein at least a subset of the raised members is receivable in a subset of the recessions when associated tumblers are rotated into a specific relative juxtaposition such that the raised members and recessions cooperate to at least partially impede relative rotation of the tumblers that include the recessions and the raised members.

11. The apparatus of claim 9 wherein the indicia on each of the tumblers includes N separate characters equi-spaced about the tumbler axis, each of the first surfaces of the tumblers forms a separate recession for each of, and that is radially aligned with each of the characters on the external surface and each of the second surfaces of the tumblers forms at least one raised member radially aligned with one of the characters on the external surface where the raised member is receivable within any one of the recessions formed by the adjacent first surface when aligned therewith such that the raised members and recessions cooperate to at least partially impede relative rotation of the tumblers.

12. The apparatus of claim 1 wherein the indicia on each of the tumblers includes N different characters.

13. The apparatus of claim 12 wherein each of the tumblers includes detent features that impede rotation of the tumbler when the tumbler is in one of N rotational positions.

14. The apparatus of claim 1 wherein the indicia includes characters radially spaced about the tumbler axis, the apparatus further including a tumbler retainer and a portion of the apparatus forming at least one alignment mark adjacent a first end of the stack such that when a specific order of characters on the external surfaces of the tumblers is aligned with the alignment mark, the pins are aligned with the gaps.

15. The apparatus of claim 14 wherein the tumbler retainer includes first and second oppositely facing surfaces on opposite ends of the stack, the tumbler stack mounted therebetween for rotation about the tumbler axis.

16. The apparatus of claim 15 wherein the tumbler retainer includes first and second end members and at least one linking member, the first and second end members forming the first and second oppositely facing surfaces and the linking member mounted between the first and second end members to maintain their positions, the first end member forming an end member opening that is aligned with the tumbler channel, the shaft member passing through the end member opening when inserted into the tumbler channel.

17. The apparatus of claim 16 wherein the key further includes a head member, the shaft member extending from the head member.

18. The apparatus of claim 17 wherein the head member covers the channel and the gap.

19. The apparatus of claim 17 wherein a portion of the tumbler retainer comprises a first stop member, a portion of the key forms a second stop member and where the first and second stop surfaces are adjacent when the key is in the tumbler channel and restrict rotation of the key shaft member within the tumbler channel.

20. The assembly of claim 19 wherein the first stop surface includes a first rotation restrictor and the second stop surface forms a second rotation restrictor and wherein the first and second rotation restrictors cooperate to restrict rotation of the key within the tumbler channel.

21. The assembly of claim 20 wherein the first restrictor is a recess and the second restrictor is a pin that extends into the recess when the shaft member is received within the tumbler channel.

22. The apparatus of claim 16 wherein the linking member includes at least three linking members equi-spaced about the tumbler stack and each linking the first and second end members.

23. The apparatus of claim 16 wherein the linking member includes at least four linking members equi-spaced about the tumbler stack and each linking the first and second end members.

24. The apparatus of claim 1 wherein the at least one of an item retainer and a message retainer is a compartment.

25. The apparatus of claim 24 wherein the compartment is formed within one side of the shaft member.

26. The apparatus of claim 24 wherein the shaft member includes first and second ends and wherein the compartment

is formed within the first end of the shaft member and extends at least partially along the length of the shaft member.

27. The apparatus of claim 2 wherein the key couplers are pins.

28. The apparatus of claim 27 wherein the shaft member has a substantially cylindrical cross section and wherein each of the tumbler openings is substantially cylindrical between the first and second surfaces.

29. The apparatus of claim 28 wherein each ridge extends inward from an associated opening adjacent the first surface and the ridge formed by the end tumbler extends inward from the recess adjacent the first surface.

30. The apparatus of claim 29 wherein the recess formed by the end tumbler is an opening that extends from the first surface to the second surface of the end tumbler.

31. The apparatus of claim 1 wherein the indicia on each of the external surfaces includes N characters and wherein the external surface of each of the tumblers includes N similarly shaped surfaces, a separate surface for each of the N characters included thereon.

32. The apparatus of claim 1 wherein at least one of the key and at least one of the tumblers is modifiable such that at least a subset of the coupler pairs allow key movement along the tumbler axis independent of the rotational position of at least one of the tumbler members.

33. The apparatus of claim 32 wherein the key is modifiable to alter the length of the shaft member.

34. The apparatus of claim 33 wherein the shaft member includes at least first and second shaft members that are linkable at adjacent first ends, wherein the shaft member length is modifiable by de-linking the second shaft member from the first shaft member.

35. The apparatus of claim 34 wherein the shaft member further includes at least a third shaft member that is linkable to the second shaft member at a second end thereof, the shaft member length further modifiable by de-linking the third shaft member from the second shaft member.

36. The apparatus of claim 1 further including a tumbler restraint mechanism that can be optionally used to restrain at least one of the tumblers in a specific rotational orientation.

37. The apparatus of claim 36 wherein the restraint mechanism restrains the at least one tumbler into an orientation such that the coupler pair including the tumbler coupler and the associated key coupler are aligned.

38. The apparatus of claim 37 wherein the restraint mechanism includes a first restraint recess formed in at least one of the first and second surfaces of the at least one tumbler member and a restraint pin that extends into the first locking recess.

39. The apparatus of claim 38 wherein the restraint mechanism includes a second restraint recess formed by a surface adjacent the surface of the tumbler that forms the first restraint recess wherein the restraint pin extends into each of the first and second restraint recesses.

40. The apparatus of claim 39 further including a separate spacer member between each two adjacent tumblers, each of the spacer members forming a spacer opening that is aligned with the tumbler axis when the tumblers are stacked.

41. The apparatus of claim 40 wherein each of the second locking recesses is formed in one of the spacer members.

42. The apparatus of claim 1 further including a separate spacer member between each two adjacent tumblers, each of the spacer members forming a spacer opening that is aligned with the tumbler axis when the tumblers are stacked.

43. The apparatus of claim 42 further including a tumbler retainer including first and second end members and at least one connecting member that traverses the distance between the first and second end members.

44. The apparatus of claim 43 wherein each of the spacer members is connected to the at least one connecting member.

45. The apparatus of claim 44 wherein the at least one connecting member includes a plurality of connecting members that connect the first and second end members.

46. The apparatus of claim 1 wherein the at least one of an item retainer and a message retainer includes an electronic memory for storing information and a power source.

47. The apparatus of claim 46 wherein the at least one of an item retainer and a message retainer also includes at least one of a visual display and an audio device for presenting at least the message.

48. The apparatus of claim 47 wherein the at least one of an item retainer and a message retainer includes a visual display and wherein the visual display is blank until the key is removed from the channel.

49. The apparatus of claim 46 wherein the information stored in the electronic memory is alterable.

50. The apparatus of claim 1 also including a processor, an electronic memory for storing information, a power source and one of an audio and a visual information output device, the output device juxtaposed with respect to the other apparatus components so that information can be communicated thereby prior to the key being removed form the channel.

51. The apparatus of claim 50 wherein the key couplers and tumbler couplers are aligned when the indicia aligned along the alignment axis form a specific answer word, the memory storing at least one clue to the answer word and the processor presenting the clue at least once via the output device.

52. The apparatus of claim 51 wherein the memory stores a plurality of clues to the answer word and the processor presents the clues one at a time.

53. The apparatus of claim 52 further including a timer linked to the processor wherein the processor presents the clues one at a time with delay periods between the presentations of consecutive clues.

54. An apparatus for concealing at least one of an item and a message that is obtainable by opening the apparatus via manipulation of the apparatus, the apparatus comprising:

a plurality of tumblers including at least one end tumbler and a sub-set of additional tumblers, each tumbler including first and second oppositely facing surfaces, an external surface between the first and second oppositely facing surfaces and indicia on the external surface, at least the sub-set of additional tumblers including an internal surface that forms an opening that extends from the first surface to the second surface of the tumbler along a tumbler axis, the end tumbler forming at least an opening in the first surface, each tumbler also including at least one tumbler coupler, the tumblers stackable with the end tumbler at one end of the stack and the first surfaces facing second surfaces of adjacent tumblers such that the tumbler openings are aligned to form a channel wherein each of the tumblers is rotatable about the tumbler axis to modify the indicia

on the external surface that is aligned along an alignment axis parallel to the tumbler axis;

a key including an elongated shaft member and at least one separate key coupler for each of the tumblers in the plurality, the key couplers spaced along the shaft member such that each key coupler is proximate an adjacent one of the tumbler couplers when the shaft member is received within the channel, each proximate tumbler coupler and key coupler forming a coupler pair;

wherein, the key is moveable along the tumbler axis when the key couplers and tumbler couplers are aligned along the alignment axis; and

wherein, at least one of the key and one of the tumblers is modifiable such that at least a subset of the coupler pairs allow key movement along the tumbler axis independent of the rotational position of at least one of the tumbler members.

55. The apparatus of claim 54 wherein a portion of the apparatus includes at least one of an item retainer and a message retainer.

56. The apparatus of claim 55 wherein the at least one of an item retainer and a message retainer includes a compartment formed in the shaft member.

57. The apparatus of claim 54 wherein a first coupler in each coupler pair includes a pin and a second coupler in each coupler pair includes a ridge that forms at least one gap, the key moveable along the tumbler axis when the pin and gap of each coupler pair is aligned and blocked from movement along the tumbler axis when at least one of the pins and gaps is misaligned.

58. The apparatus of claim 54 wherein the key is modifiable to alter the length of the shaft member.

59. The apparatus is claim 58 wherein the tumblers are prevented from separating by placing them in a retainer, the retainer having a retainer top, a retainer bottom and at least one connector between the retainer top and the retainer bottom and where the at least one connector can be changed in length by one of altering the at least one connector or replacing the at least one connector with a different connector having another length.

60. The apparatus of claim 58 wherein the shaft member include at least first and second shaft member components that are linkable at adjacent first ends, wherein the shaft member length is modifiable by de-linking the second shaft member from the first shaft member.

61. The apparatus of claim 60 wherein the shaft member further includes at least a third shaft member that is linkable to the second shaft member at a second end thereof, the shaft member length further modifiable by de-linking the third shaft member from the second shaft member.

62. The apparatus of claim 57 wherein the key couplers are pins.

63. The apparatus of claim 62 wherein the key is modifiable to allow key movement along the tumbler axis independent of the rotational position of at least one of the tumbler members by removing at least a subset of the pins.

64. An apparatus for concealing at least one of an item and a message that is obtainable by opening the apparatus via manipulation of the apparatus, the apparatus comprising:

a plurality of tumblers including at least one end tumbler and a sub-set of additional tumblers, each tumbler including first and second oppositely facing surfaces, an external surface between the first and second oppositely facing surfaces and indicia on the external surface, at least the sub-set of additional tumblers including an internal surface that forms an opening that extends from the first surface to the second surface of the tumbler along a tumbler axis, the end tumbler forming at least an opening in the first surface, each tumbler also including at least one tumbler coupler, the tumblers stackable with the end tumbler at one end of the stack and the first surfaces facing second surfaces of adjacent tumblers such that the tumbler openings are aligned to form a channel wherein each of the tumblers is rotatable about the tumbler axis to modify the indicia on the external surface that is aligned along an alignment axis parallel to the tumbler axis;

a key including an elongated shaft member and at least one separate key coupler for each of the tumblers in the plurality of tumblers, the key couplers spaced along the shaft member such that each key coupler is proximate an adjacent one of the tumbler couplers when the shaft member is received within the channel, each proximate tumbler coupler and key coupler forming a coupler pair; and

a tumbler restraint mechanism that can be optionally used to restrain at least one of the tumblers into a specific rotational orientation;

wherein, the key is moveable along the tumbler axis when the key couplers and tumbler couplers are aligned.

65. The apparatus of claim 64 wherein the restraint mechanism is useable to restrain the at least one tumbler into an orientation such that the coupler pair including the tumbler coupler and the associated key coupler are aligned.

66. The apparatus of claim 65 wherein the restraint mechanism includes a first restraint recess formed in at least one of the first and second surfaces of the at least one tumbler member and a restraint pin that extends into the first restraint recess.

67. The apparatus of claim 66 wherein the restraint mechanism includes a second restraint recess formed by a surface adjacent the surface of the tumbler that forms the first restraint recess wherein the restraint pin extends into each of the first and second restraint recesses.

68. The apparatus of claim 67 further including a separate spacer member between each two adjacent tumblers, each of the spacer members forming a spacer opening that is aligned with the tumbler axis when the tumblers are stacked.

69. The apparatus of claim 68 wherein each of the second restraint recesses is formed in one of the spacer members.

70. The apparatus of claim 64 wherein at least one of the key and at least one of the tumblers includes at least one of an item retainer and a message retainer.

71. The apparatus of claim 64 wherein the at least one of an item retainer and a message retainer includes a compartment formed in the shaft member.

72. An apparatus for concealing at least one of a message and an item that is obtainable by via manipulation of the apparatus, the apparatus comprising:

a plurality of tumblers, each tumbler including first and second oppositely facing surfaces, an external surface between the first and second oppositely facing surfaces and indicia on the external surface, at least the sub-set of additional tumblers including an internal surface that

forms an opening that extends from the first surface to the second surface of the tumbler along a tumbler axis, the tumblers stackable with the end tumbler at one end of the stack and the first surfaces facing second surfaces of adjacent tumblers such that the tumbler openings are aligned to form a channel wherein each of the tumblers is rotatable about the tumbler axis to modify the indicia on the external surface that is aligned along an alignment axis parallel to the tumbler axis;

a key including an shaft member receivable within the channel;

the apparatus including at least one of an item retainer and a message retainer;

at least one sensor for sensing when the tumblers are in at least a first unlock position; and

a processor linked to the sensor and, when the tumblers are in the at least a first unlock position, rendering the at least one of the message and the item accessible.

73. The apparatus of claim 72 wherein the at least one sensor senses the positions of each of the tumblers.

74. The apparatus of claim 73 wherein each of the tumblers includes an electrically conductive member that extends from the first to the second surface of the tumbler and, wherein, the sensor senses when the conductor members in the tumblers are aligned.

75. The apparatus of claim 74 wherein the retainer includes at least one output device linked to the processor and, wherein, the step of rendering one of the item and message accessible includes the step of generating a message via the output device.

76. The apparatus of claim 75 wherein the output device is at least one of an audio output device and a visual output device.

77. The apparatus of claim 75 wherein the output device is a visual display device on the key that is observable when the key is removed from the channel.

78. The apparatus of claim 77 further including a locking mechanism that locks the key within the channel until the tumblers are in the first unlock position.

79. The apparatus of claim 78 wherein, when the key is removed from the channel prior to the tumblers being in the first unlock position, the message is rendered inaccessible via the display device.

80. The apparatus of claim 74 wherein the at least one of an item retainer and a message retainer includes a visual display device linked to the processor and, wherein, the step of rendering at least one of an item and a message accessible includes the step of generating the message via the display device.

81. The apparatus of claim 80 wherein the visual display device is on the key and is hidden when the shaft member is received within the channel.

82. The apparatus of claim 74 wherein the key is freely removable from the channel and, wherein, the processor only renders the message accessible when the tumblers are in the first unlock position upon removal of the key member.

83. The apparatus of claim 82 wherein, when the key is removed from the channel with the tumblers in other than the first unlock position, the processor times out a waiting period during which the message is inaccessible independent of tumbler positions.

84. The apparatus of claim 83 further including an output device linked to the processor that indicates when the waiting period has ended.

85. The apparatus of claim 72 wherein the retainer is a compartment.

86. The apparatus of claim 85 further including a locking mechanism controllable to retain the key within the channel, wherein the compartment is formed by the key and wherein the processor renders the one of the item and message accessible by unlocking the locking mechanism so that the key is removable form the channel.

87. An apparatus for concealing at least one of an item and a message that is obtainable by opening the apparatus via manipulation of the apparatus, the apparatus comprising:

a retainer for retaining at least one of an item and a message;

a processor;

an electronic memory linked to the processor for storing at least an answer word and at least one clue to the answer word;

an output device linked to the processor for presenting the at least one clue; and

an input device linked to the processor for specifying a specified word;

wherein, the processor presents the at least one word puzzle via the output device, receives specified words via the input device and renders the one of an item and a message accessible via the retainer when the specified word matches the answer word.

88. The apparatus of claim 87 wherein the memory stores a plurality of clues to the answer word and, wherein, the processor presents the clues consecutively via the output device.

89. The apparatus of claim 88 wherein the processor presents the clues at spaced apart time intervals via the output device.

90. The apparatus of claim 87 wherein the answer word and associated word puzzle are a final answer word and a final word puzzle, respectively, and wherein the memory stores a series of intermediate answer words and associated intermediate word puzzle, the processor presenting the intermediate word puzzle prior to the final word puzzle, for each intermediate word puzzle, the processor presenting the intermediate word puzzle via the output device, receiving specified words via the input device and, when a specified word matches the intermediate answer word, skipping to the next intermediate word puzzle until all of the intermediate answer words have been matched.

91. The apparatus of claim 87 wherein the retainer includes at least one of a visual display device and an audio device linked to the processor.

92. The apparatus of claim 87 wherein the retainer includes a container.

93. The apparatus of claim 92 further including a locking mechanism controllable by the processor to lock and unlock the container and, wherein, the step of rendering the at least one of the item and the message accessible includes unlocking the locking mechanism.

94. The apparatus of claim 87 wherein the input device is a keypad.

95. The apparatus of claim 87 wherein the input device includes a plurality of tumblers, each tumbler including a lateral surface, indicia on the lateral edge and rotatable about a tumbler axis.

96. The apparatus of claim 87 wherein the memory is re-programmable with other answer words and word puzzles.

97. The apparatus of claim 87 where the electronic memory is the retainer.

98. An apparatus for concealing at least one of an item and a message that is obtainable by opening the apparatus via manipulation of the apparatus, the apparatus comprising:

a plurality of tumblers including at least one end tumbler and a sub-set of additional tumblers, each tumbler including first and second oppositely facing surfaces, an external surface between the first and second oppositely facing surfaces and indicia on the external surface, at least the sub-set of additional tumblers including an internal surface that forms an opening that extends from the first surface to the second surface of the tumbler along a tumbler axis, the end tumbler forming at least an opening in the first surface, the tumblers stackable with the end tumbler at one end of the stack and the first surfaces facing second surfaces of adjacent tumblers such that the tumbler openings are aligned to form a channel wherein each of the tumblers is rotatable about the tumbler axis to modify the indicia on the external surface that is aligned along an alignment axis parallel to the tumbler axis, the tumblers having at least one unlocked juxtaposition;

a key including an shaft member wherein the key is receivable within the channel;

a retainer for retaining at least one of an item and a message;

a processor;

an electronic memory linked to the processor for storing at least an answer word;

a first sensor linked to the processor for sensing the key within the channel;

a second sensor linked to the processor for sensing the positions of the tumblers;

wherein, the processor monitors removal of the key from the channel and, when the key is removed from the channel, determines if the tumblers are in the unlocked juxtaposition and, if the tumblers are in the unlocked juxtaposition, renders the at least one item and message accessible.

99. The apparatus of claim 98 further including at least one of an audio and a visual display device and wherein the step of rendering the one of the item and the message accessible includes presenting the message via the at least one of the devices.

100. The apparatus of claim 98 wherein, when the key is removed from the channel and the tumblers are in other than the unlocked juxtaposition, the processor performs a secondary function.

101. The apparatus of claim 100 wherein the secondary function includes rendering the one of the item and the message inaccessible.

102. The apparatus of claim 100 wherein the secondary function includes rendering the one of the item and the message inaccessible independent of the positions of the tumblers and the key for a time out period and thereafter rendering the one of the item and the message accessible when the tumblers are in the unlocked juxtaposition when the key is subsequently removed from the channel.

103. The apparatus of claim 98 further including a manual latching mechanism that latches the key into the channel, the latching mechanism operable to de-latch the key so that the key is removable from the channel.

104. The apparatus of claim 98 wherein the first sensor includes at least one electrical contact on the key member.

105. The apparatus of claim 98 wherein the second sensor includes a separate electrical conductor associated with each tumbler where each conductor is positioned to form part of a closed circuit with the processor when specific indicia on the external surface are aligned along an alignment axis that is parallel to the tumbler axis.

106. The apparatus of claim 105 wherein the conductors of adjacent tumblers make electrical contact when the tumblers are aligned in the unlocked juxtaposition.

107. The apparatus of claim 98 wherein the memory is re-programmable so that each of the answer word and the unlocking juxtaposition can be modified.

108. The apparatus of claim 98 wherein the second sensor is part of the first sensor.

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