

Feb. 14, 1961

D. PARKER

2,971,283

WRITING INSTRUMENT

Filed May 23, 1958

2 Sheets-Sheet 1

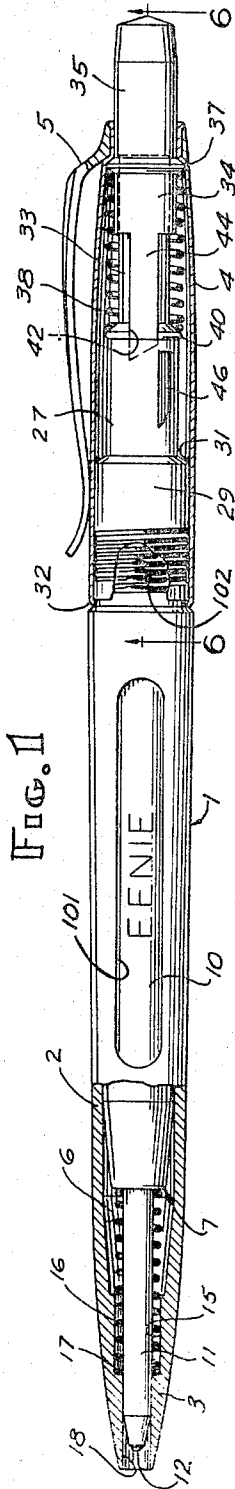


FIG. 1

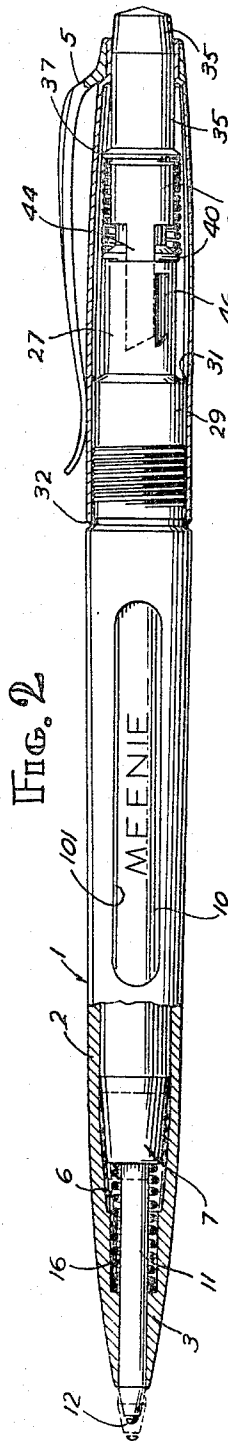


FIG. 2

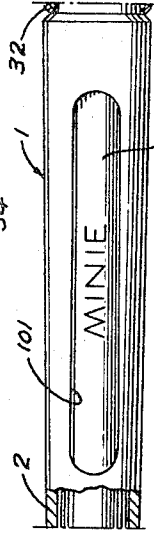


FIG. 3

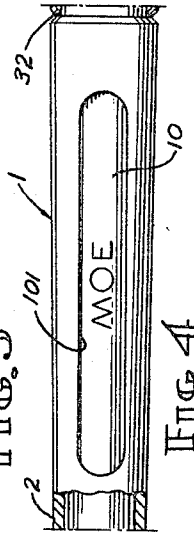


FIG. 4

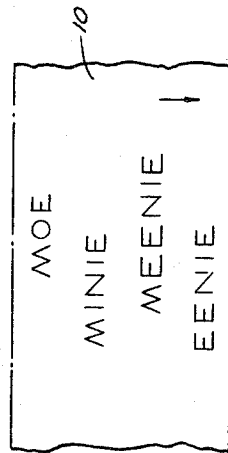


FIG. 5

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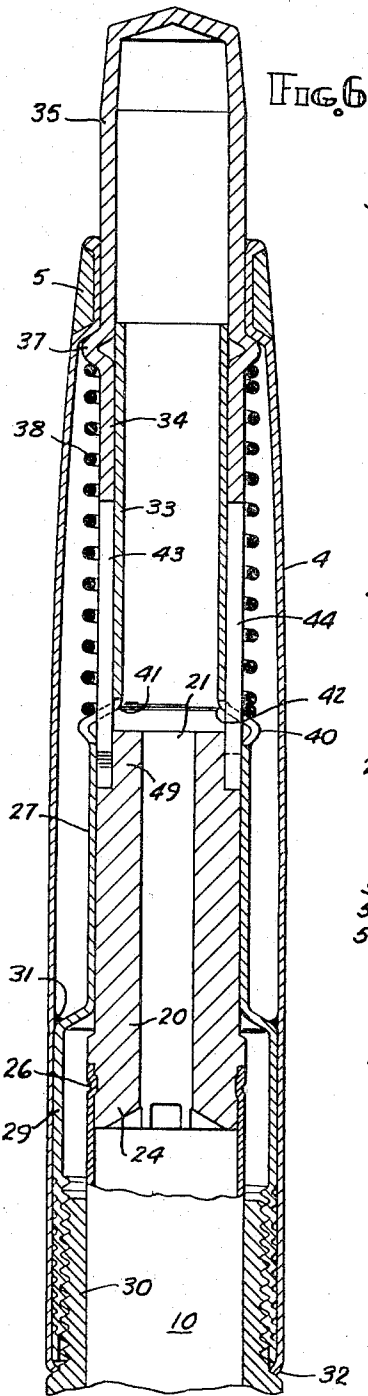


FIG. 6

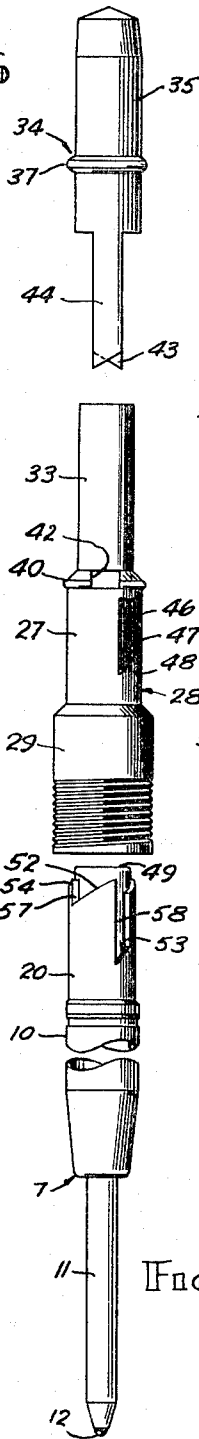


FIG. 7

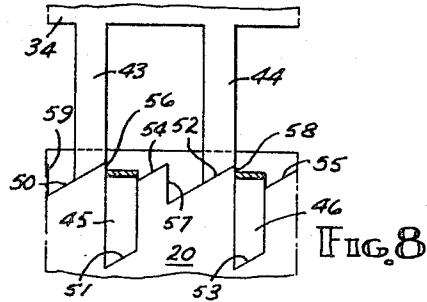


FIG. 8

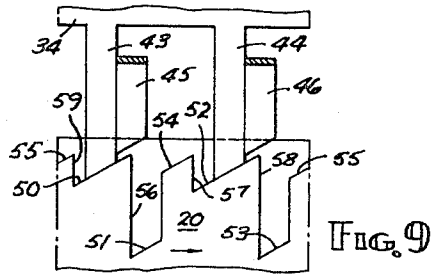


FIG. 9

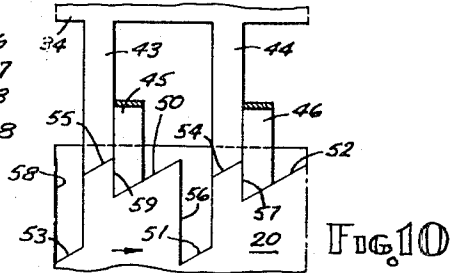


FIG. 10

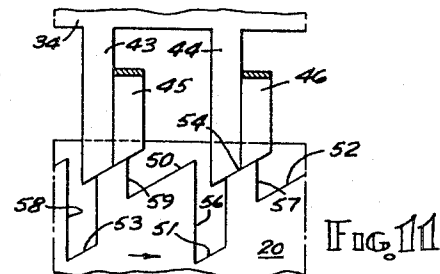


FIG. 11

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WRITING INSTRUMENT

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3 Claims. (Cl. 40—334)

This invention relates to retractable ball point writing instruments having moving message display means, and relates particularly to such devices wherein a plurality of message segments are consequently displayed in response to operation of the projection-retraction means.

An object of the invention is to provide novel means for conveying a message (such as a slogan, name, address, telephone number), by rotating the message segments of the message consecutively into view at one station of the instrument.

Another object of the invention is to provide a retractable ball point writing instrument having a window therein and having a reciprocable and rotatable member carrying a plurality of message segments which are brought consecutively into view through the window upon consecutive operations of the instrument's projection-retraction means to thereby convey the message.

A further object is to provide such a device having means insuring that the message segments register with the window in perfect alignment, both axially and circumferentially.

Other objects and advantages of the invention will appear from the following description taken in connection with the appended drawings, wherein:

Fig. 1 is an elevational view of a ball point writing instrument embodying the invention, showing the internal members in elevation, the housing partly in section, and the writing point in retracted position;

Fig. 2 is a view similar to that of Fig. 1 but showing the writing point moved to its projected position and illustrating that the cartridge has rotated;

Fig. 3 is a view similar to portions of Figs. 1 and 2, of a portion of the writing instrument, illustrating the further rotation of the cartridge when the writing point is next moved to retracted position;

Fig. 4 is a view similar to that of Fig. 3 but showing the rotated position of the cartridge when next moved to the projected position;

Fig. 5 is a flat layout developed view of that portion of the cartridge having the message segments thereon, and indicating the direction of rotation of the cartridge;

Fig. 6 is a fragmentary, longitudinal sectional view through the rearward portion of the instrument taken along the line 6—6 of Fig. 1 and showing the cartridge member and the projection-retraction mechanism in their retracted positions;

Fig. 7 is an exploded view of elevation of the cartridge member (central portion removed) and the projection-retraction mechanism;

Figs. 8, 9, 10 and 11 are diagrammatic developed views illustrating step-by-step the manner in which camming surfaces of a cam body carried by the cartridge member are engaged alternately by stationary actuating means and longitudinally movable actuating means to effect the axial and rotating movement of the cartridge member during the retracting-projecting operation.

Referring to the drawings, the illustrated embodiment

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of the invention comprises a housing 1 having a forward section 2 with a tapered tip 3, and a rear section 4 carrying a pocket clip 5. The housing 1 is formed with a bore defining a chamber 6 which receives the front end of a cartridge member 7 which is associated with a projection-retraction mechanism to be described hereinafter.

The cartridge member 7 which may simply be referred to as the ball point cartridge of the instrument, includes an ink reservoir section 10 containing a quantity of ink suitable for use with ball point writing instruments, an ink feed section 11, and a ball writing point 12 carried at the forward end of the member 7 and mounted firmly in a seat (not shown) in communication with a feed channel (not shown) within the ink feed section 11 and leading to the reservoir section 10.

Forwardly of the chamber 6 is a reduced diameter section 15 for receiving one end of a return or retracting spring 16 for the cartridge member 7, seated against a shoulder 17 and bearing against the forward end of the reservoir section 10, and a bore 18 of a smaller diameter than section 15 which receives and guides the forward reduced ink feed section 11.

Secured rigidly in the rearward end of the reservoir section 10 and forming a self-contained part of the cartridge member and replaceable therewith is a cam body 20 which constitutes an essential part of the projection-retraction mechanism of the instrument. The cam body 20 is provided with a central opening or bore 21 for supplying air uniformly to the rear end of the ink column in the reservoir section 10 to fill the space left by ink withdrawn from the writing end of the unit. The cam body 20 is secured to the rear end of reservoir section 10 in ink-tight relation therewith by providing a cylindrical end portion 24 fitting snugly within the end of the reservoir section up to a shoulder 25 and by firmly securing them together as by crimping, as indicated at 26.

The cam body 20 is rotatably and slidably disposed within a tubular central portion 27 of a stationary guide member 28 so as to in effect be "floating" therein. The guide member 28 has formed integrally therewith an internally threaded, enlarged, forwardly extending portion 29 in engagement with an externally threaded end 30 of the forward section 2 of the housing 1. The guide member 28 is secured within the rear housing section 4 as by a soldered joint 31 and a pinned-over edge 32 of the end piece. A rearwardly extending, reduced diameter portion 33 of the guide member 28 serves as an internal guide for a tubular plunger 34 formed integrally with a push button 35. Plunger 34 is the reciprocable operating member of the instrument. The push button 35 projects through a rear opening 36 in the rear housing section 4 and is provided with a shoulder 37 for limiting the extent of its rearward movements and serving as an abutment for a push button return spring 38 whose other end bears against a shoulder 40 on the guide member 28.

The shoulder 40 is provided with a pair of radially opposite slots 41 and 42 for receiving respective ones of a pair of diametrically opposite fingers 43 and 44 formed integrally with a portion extending forwardly from the plunger 34 inside the central, tubular portion 27 of the guide member 28. The two stop members 45 and 46 extend longitudinally within the central portion 27 of the guide member 28, adjacent and parallel with the fingers 43 and 44, respectively. The stop members 45 and 46 may conveniently be formed by a pair of parallel, longitudinal cuts 47 and a diagonal cut 48 in the tubular wall of the central portion 27 of the guide member 28 to form a tab which then is displaced inwardly to depend at its rearward end from the guide member.

A cylindrical cam body 20 is provided with a plurality

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of cam surfaces 50, 52, 54, 55, diametrically opposite pairs of which are successively engageable by the fingers 43 and 44 to impart unidirectional rotational movement as well as longitudinal reciprocating movement to the cam body and the connected cartridge member 7 when the push button 35 is repeatedly depressed to thereby align alternate cam surfaces with the stationary stop members 45 and 46 disposed to abut the cam surfaces and bottom surfaces 51, 53, to positively maintain the cartridge member-cam body alternately in projected and retracted positions.

The cam surfaces 56, 52, 54, 55 face toward the rear of the writing instrument and are equidistantly spaced from the axis of rotation of the cam body throughout their entire extent. The shapes and relative positions of the cam surfaces are better seen in the exploded view in Fig. 7 and in the developed views of the cam body shown in Figs. 8 to 11. Each of the cam surfaces preferably follows a 45 degree helix about the cylindrical cam body. The cam surfaces 50, 52, 54, 55 are oriented in the same sense, i.e., they are oriented so as to impart a unidirectional rotational movement to the cam body when moved against a rotationally fixed cam actuating means. Each of the diametrically opposite bottom surfaces 51 and 53 is located axially forwardly of the cam surfaces 50, 54, 52, and 55, respectively. A stop surface 56 extending substantially parallel of the axis of the cam body is disposed between the trailing edge of the bottom surface 51 and the leading edge of the cam surface 50. A stop surface 57 is disposed between the trailing edge of cam surface 52 and the leading edge of cam surface 54. Similar stop surfaces 58 and 59 are connected between the trailing edge of bottom surface 53 and the leading edge of cam surface 52, and between the trailing edge of cam surface 50 and the leading edge of cam surface 55, respectively. The cam surfaces and bottom surfaces taken together are angularly contiguous and stop surfaces 56, 57, 58 and 59 are spaced apart by substantially ninety degrees, the cam surfaces 50 and 52 each being substantially twice as long as each of the cam surfaces 54 and 55 and bottom surfaces 51 and 53.

There are provided two contiguous sets of cam and stop surfaces, each set comprising a bottom surface 51, 53 flanged by a cam surface 50, 54 and 52, 55, respectively, axially spaced rearwardly thereof. The cam surfaces are formed so as to provide a central hub 49 of such diameter as to slidably fit between actuating fingers 43 and 44 and between stationary stop members 45 and 46. Fingers 43 and 44 and stationary stop members 45 and 46 have the respective ends thereof formed at an angle corresponding to that of the cam surfaces 50, 52, 54, 55 and in the same sense. The plunger 34 carrying the push button 35 is normally biased rearwardly by the spring 38, with the shoulder 37 of the plunger abutting the inside rear end of the rear housing section or end piece 4 of the housing. The cartridge member is biased rearwardly by the return spring 16 which also serves to provide the motive power for effecting the axial retracting movement and rotational movement of the cam body 20 by biasing opposite pairs of cam surfaces 54, 55 or 50, 52 (Figs. 8 and 10) of the cam body against the stationary stop members 45 and 46, depending upon the angular orientation of the cylindrical cam body with respect thereto. If the orientation of the cam body 20 within the guide member 28 is such that the stop members 45 and 46 engage the cam surfaces 50 and 52, the cartridge member will be maintained in its projected position, while if the orientation of the cam body 20 is such that the stop members will engage bottom surfaces 51 and 53, the cam body 20 and the cartridge member will be permitted to extend further into the guide member 28 by a distance equal to the axial distance between the cam surfaces 50, 52 and bottom surfaces 51, 53, wherein the cartridge member will be in its retracted position. Successive full depressions (forward movements) and full retractions (rearward movements) of

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push button 35 will, through corresponding movements of actuating fingers 43 and 44, successively depress and rotate the cam body 20 so as to cause alternate pairs of cam surfaces 50, 52 and bottom surfaces 51, 53 to be engaged by the stationary stop members 45 and 46. This, in turn, will cause the cartridge member to assume alternately an extended writing position and a retracted non-writing position and to be displaced rotationally ninety degrees each time moved from one position to the other.

When the cam body 20 has been depressed to an extent sufficient to permit the rearward edges of stop surfaces 56 and 58 to clear the forward edges of stop members 45 and 46 (Fig. 9), the cam body 20 is free to rotate and does rotate (in the direction indicated by the arrow) under the influence of the return spring 16 (Fig. 1) which applies a continuous rearward force to the cam body until fingers 43 and 44 abut longitudinally extending stop surfaces 59 and 57, respectively.

When the push button 35 is released and fingers 43 and 44 are moved rearwardly, the cam body 20 will be free to and does continue its rotational movement until stop members 45 and 46 abut the longitudinal edges 59 and 57, respectively. The cam body 20 and the cartridge member 7 will thus have been rotated through an angle of ninety degrees and will be in their projected position.

Fig. 10 shows the positions of the operating parts of the projection-retraction mechanism as the push button 35 is partly depressed with actuating fingers 43 and 44 in engagement with cam surfaces 55 and 54, respectively. As the push button 35 is fully depressed the fingers 43 and 44 are displaced further forwardly and will carry with them a cam body 20 until the stop surfaces 59 and 57 clear the stop members 45 and 46, respectively, at which time the cam body rotates in a clockwise direction as indicated in Fig. 11. The cam body 20 will continue to rotate until fingers 43 and 44 engage respectively, the bottom surfaces 51 and 53 and the stop surfaces 58 and 56. The stop members 45 and 46 will now be in alignment with the cam surfaces 55 and 54. When now the push button 35 is released and moved rearwardly, the fingers 43 and 44 will be retracted and the cam body 20 will be permitted to rotate until stationary stops 45 and 46 engage the stop surfaces 58 and 56 and the bottom surfaces 51 and 53, respectively. The cam body 20 will now again be in its retracted position displaced by one-half a revolution from the corresponding position shown in Fig. 8. It will thus be seen that, as the push button 35 is successively moved forwardly and moved rearwardly, the cam body 20 and the cartridge member 7 will be successively positioned so as to engage the stop members 45 and 46 by the axially displaced pairs of the cam surfaces 50, 52 and bottom surfaces 51, 53 to alternately assume projected and retracted positions. Thus each time the cartridge member is moved from retracted position to projected position or vice versa it is turned through an angle of ninety degrees. It is thus seen that the stop means 45, 46 are received alternately, in either retracted or projected position of the cartridge member, by either the recess portions (grooves) having the bottom surfaces 51, 53 or the recess portions (grooves) having the cam surfaces 50, 52 as their bottoms.

It will thus be appreciated as the push button 35 is moved forwardly and rearwardly, the cartridge member will be moved from one of said projected and retracted positions to the other of said positions. Upon the next forward and rearward movement of the push button, the cartridge member will be moved from its present position to its former position. Each time the cartridge member is moved from one position to the other it is rotated ninety degrees with respect to the housing.

It will be noted that the cartridge member is positively held against rotation, by the fixed stop members, when

the cartridge is in either the projected or the retracted position.

A message-viewing window 101 is provided in the forward section 2 of the housing 1. A message is provided on the cartridge member. The message comprises four message segments, being shown as Eenie, Meenie, Minie and Moe. These message segments are spaced equidistantly circumferentially (peripherally) about the cartridge member. Each of the message segments is displaced ninety degrees from its adjacent message segments. The message segments are disposed upon the cartridge member so that upon actuation of the projection-retraction means to reciprocate and rotate the cartridge member, the message segments come into registry with the window in the projected and the retracted position. That is, Eenie is in registry with the window when the cartridge member is in retracted position, Meenie is in registry with the window when the cartridge member is next in projected position, Minie is in registry with the window when the cartridge member is next in retracted position, and Moe is in registry with the window when the cartridge is next in projected position.

To insure perfect alignment circumferentially between the window and the message segments in the projected and retracted positions, the threaded engagement between the forward housing section 2 and the rearward housing section 4 is provided with one or more deformed threads, indicated at 102, to thereby permit rotational threading displacement of forward section 2 relative to rearward section 4 without loosening the thread joint of said sections to thereby permit perfect circumferential alignment of window 101 and one of the message segments.

The message segments are staggered axially on the cartridge member so as to be centered in the window axially when they are moved into registry with the window. Circumferentially consecutive ones of the message segments are staggered axially and alternate ones of the message segments have their centers aligned circumferentially.

It will thus be seen that the message segments will be in perfect registry both axially and circumferentially, with the window, when they come into view therethrough.

This invention provides a writing instrument "pocket-sign" with moving advertising copy (or other message) wherein such advertising copy may be presented in a number of continuous moving steps (for example as here shown, four), this being an ideal message sending means for slogans, names, addresses, phone numbers and other information.

Although but one embodiment of the invention has been described herein it will be apparent to those skilled in the art that various modifications hereof may be made without departing from the spirit of this invention and from the scope of the appended claims.

I claim:

1. A retractable ball point writing instrument having moving message display means, said instrument comprising: a housing; a ball point cartridge member mounted in the housing; projection-retraction means including a reciprocable member for moving said cartridge member forwardly to a projected position and rearwardly to a retracted position and for simultaneously unidirectionally rotating said cartridge member to successively different rotative positions upon successive operations of said reciprocable member; a longitudinal window in said housing; and a plurality of message segments disposed equidistantly circumferentially about said cartridge member for successively moving said segments into view through said window upon said successive operations, the circumferentially consecutive ones of said message segments being staggered axially on said cartridge member for longitudinally centering the circumferentially alternate ones in said window in the two positions of said cartridge member.

2. A retractable ball point writing instrument having moving message display means, said instrument comprising: a housing; a ball point cartridge member mounted in the housing; projection-retraction means for simultaneously unidirectionally rotating said cartridge member and moving said cartridge member forwardly to a projected position and rearwardly to a retracted position thereby placing said cartridge member in successively different rotative positions upon successive actuations of said projection-retraction means; a longitudinal window in said housing; and a plurality of message segments disposed equidistantly circumferentially about said cartridge member for successively moving said segments into view through said window upon said successive actuations, the circumferentially consecutive ones of said message segments being staggered axially on said cartridge member for longitudinally centering the circumferentially alternate ones in said window in the two positions of said cartridge member; said housing comprising a forward section and a rearward section in threaded engagement, said cartridge member being restrained against rotation relative to said rearward section when in said projected and retracted positions, said window being in said forward section, and said threaded engagement including a deformed thread thereby permitting rotational displacement of said sections without loosening said engagement for establishing perfect circumferential centering of said message segments in said window.

3. A retractable ball point writing instrument having moving message display means, said instrument comprising: a housing; a ball point cartridge member axially slidably mounted in the housing and movable forwardly to projected position and rearwardly to retracted position; a spring urging said cartridge member rearwardly, projection-retraction mechanism including a cam body connected to the cartridge member, a reciprocable member restrained against rotation for axially moving said cam body and cartridge member, and means fixed in said housing coacting with said cam body upon axial movement thereof to unidirectionally rotate said cam body and cartridge member to successively different rotative positions upon axial movement thereof on successive operations of said reciprocable member; a longitudinal window in said housing; and a plurality of message segments disposed equidistantly circumferentially about said cartridge member for successively moving said segments into view through said window upon said successive operations; said housing comprising a forward section and a rearward section in threaded engagement, said cartridge member being restrained against rotation relative to said rearward section when in said projected and retracted positions, said window being in said forward section, and said threaded engagement including a deformed thread thereby permitting rotational displacement of said sections without loosening said engagement for establishing perfect circumferential centering of said message segments in said window; the circumferentially consecutive ones of said message segments being staggered axially on said cartridge member for longitudinally centering the circumferentially alternate ones in said window in the two positions of said cartridge member.

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