June 4, 1963 H. ERDMANN 3,092,287

DISPENSING APPARATUS FOR SPRING RETAINING RINGS

Filed July 12, 1960 4 Sheets-Sheet 1

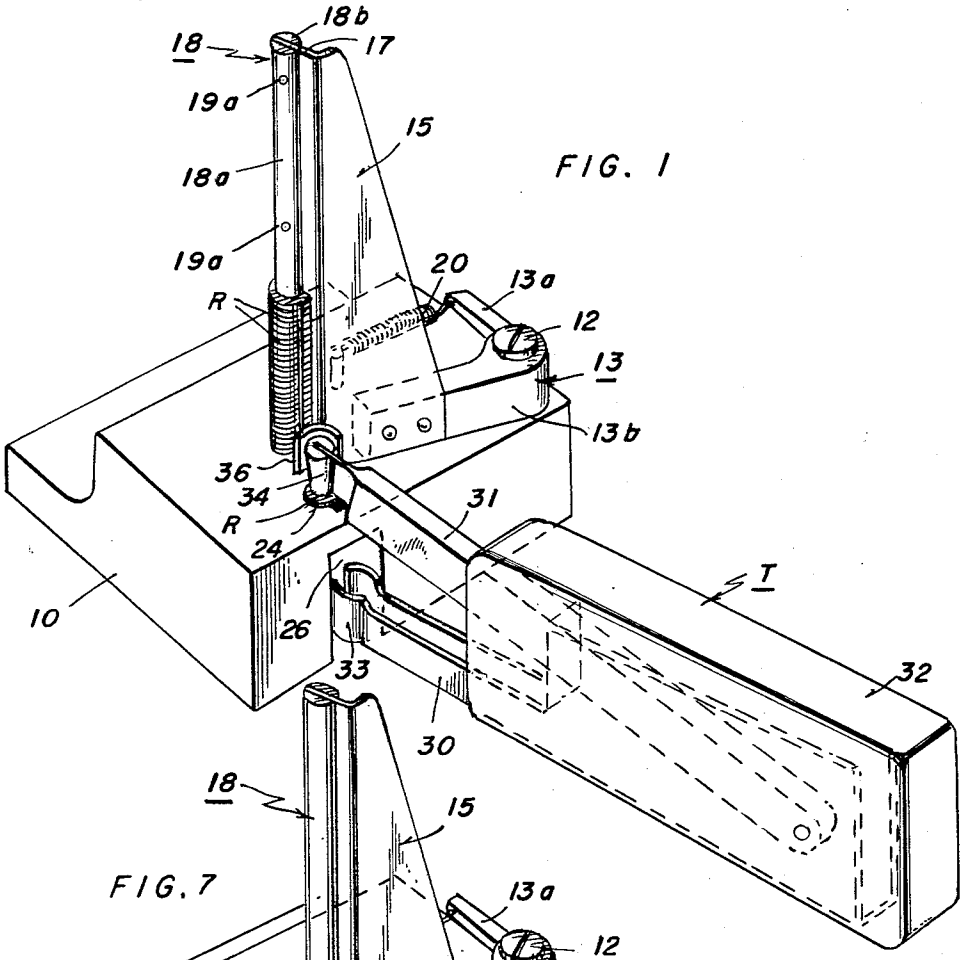


FIG. 1

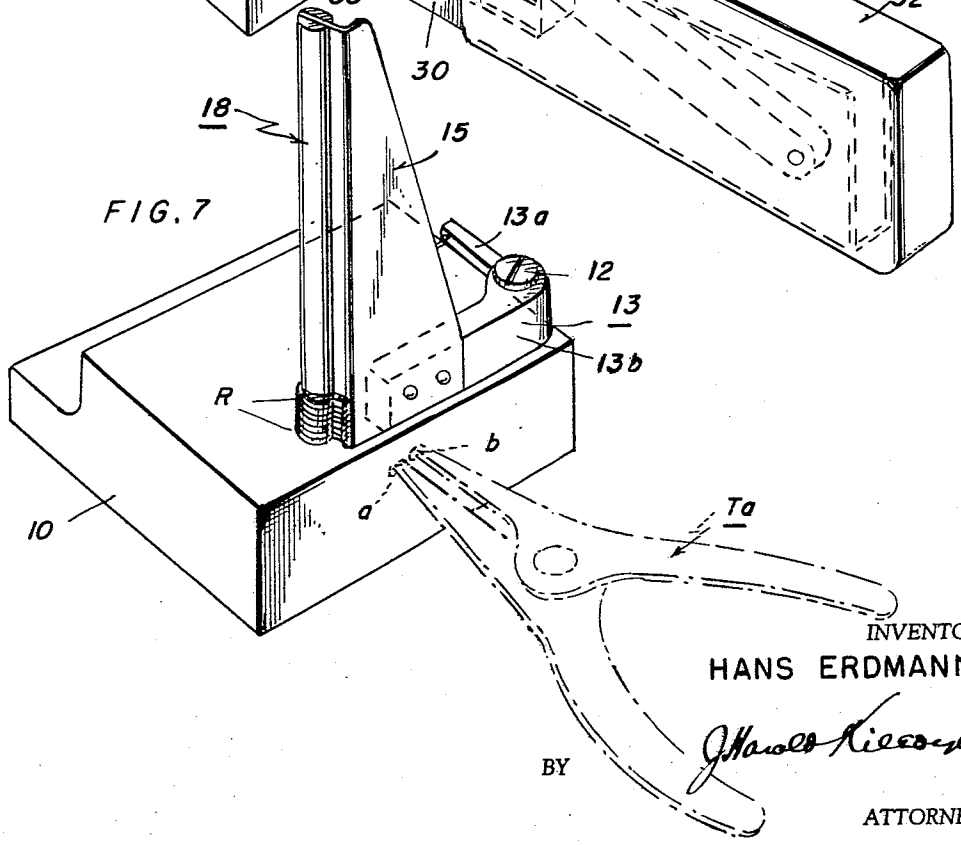


FIG. 7

INVENTOR
HANS ERDMANN

BY

ATTORNEY

June 4, 1963 H. ERDMANN 3,092,287

DISPENSING APPARATUS FOR SPRING RETAINING RINGS

Filed July 12, 1960 4 Sheets-Sheet 2

FIG. 2

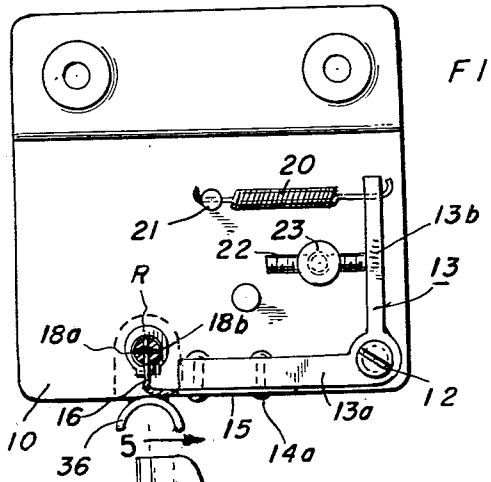


FIG. 3

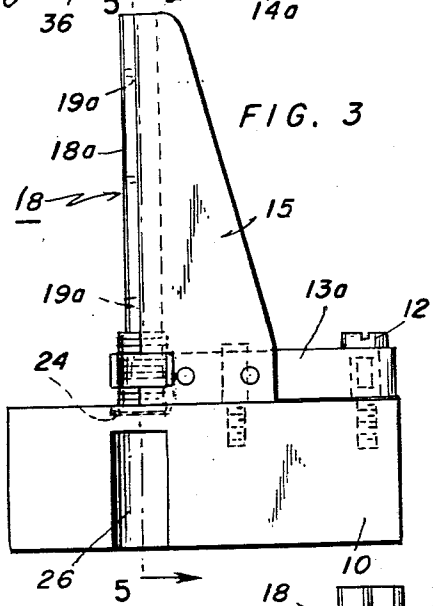


FIG. 5

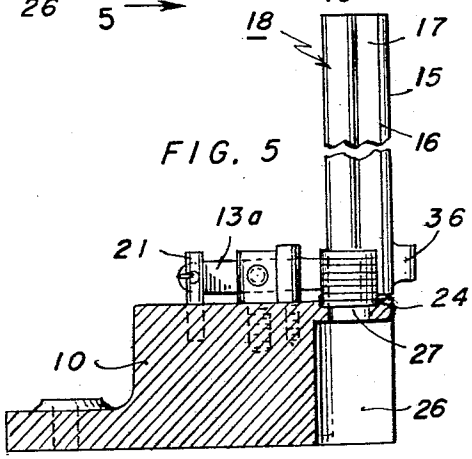


FIG. 6

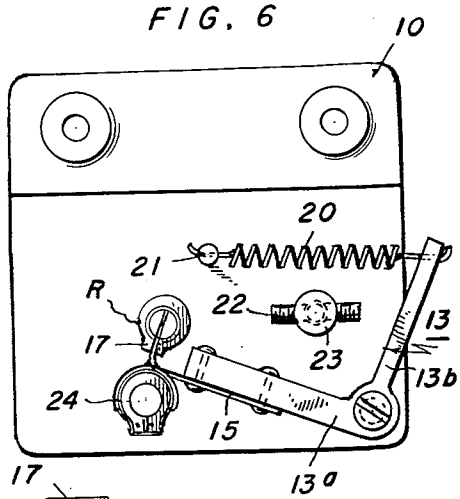
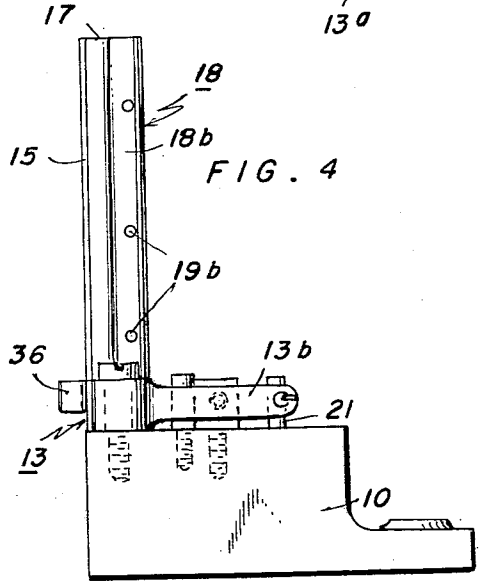


FIG. 4



INVENTOR
HANS ERDMANN

BY J. Harold Kissinger

ATTORNEY

June 4, 1963 H. ERDMANN 3,092,287

DISPENSING APPARATUS FOR SPRING RETAINING RINGS

Filed July 12, 1960 4 Sheets-Sheet 3

FIG. 9

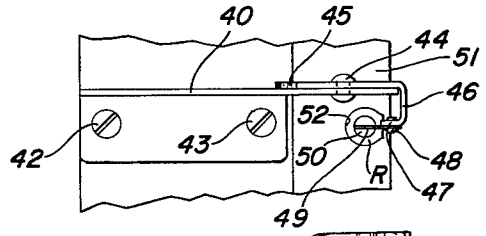
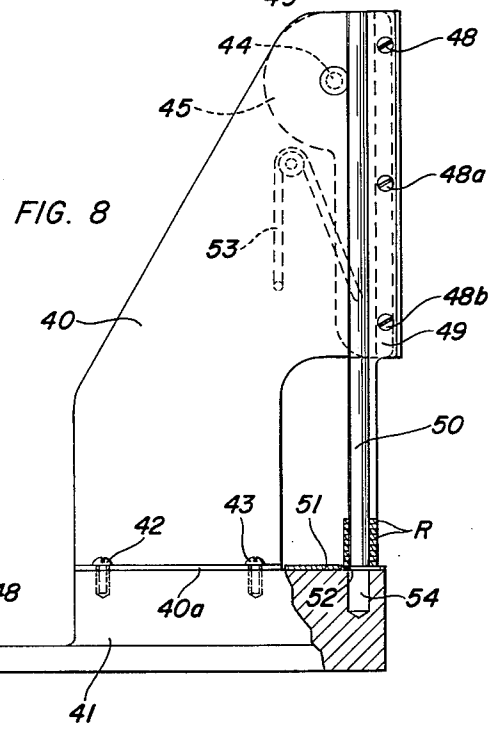


FIG. 8



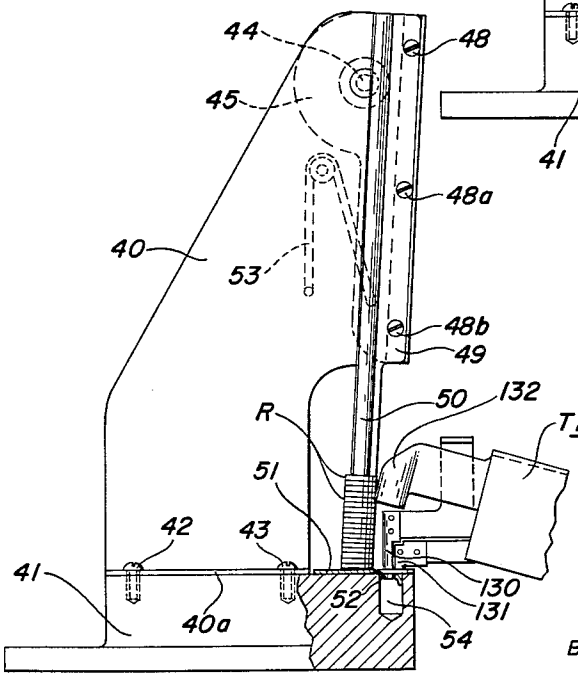


FIG. 10

INVENTOR
HANS ERDMANN

BY Harold Kissoyue

ATTORNEY

June 4, 1963 H. ERDMANN 3,092,287

DISPENSING APPARATUS FOR SPRING RETAINING RINGS

Filed July 12, 1960 4 Sheets-Sheet 4

FIG. 11

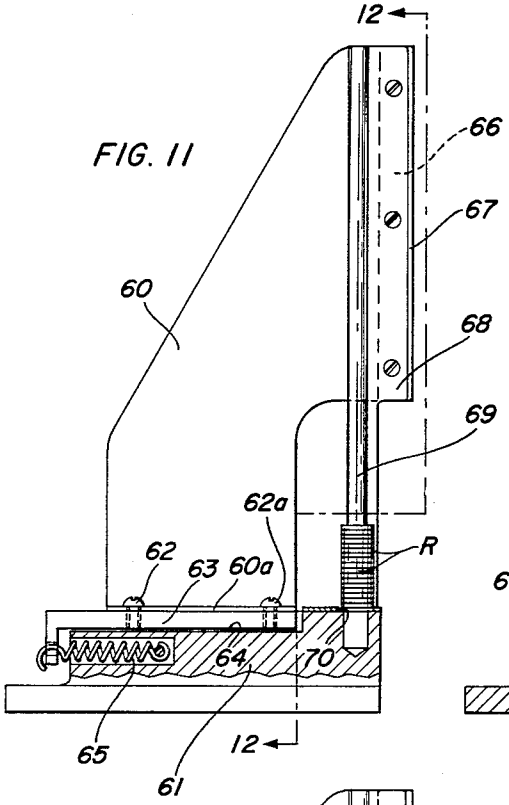


FIG. 12

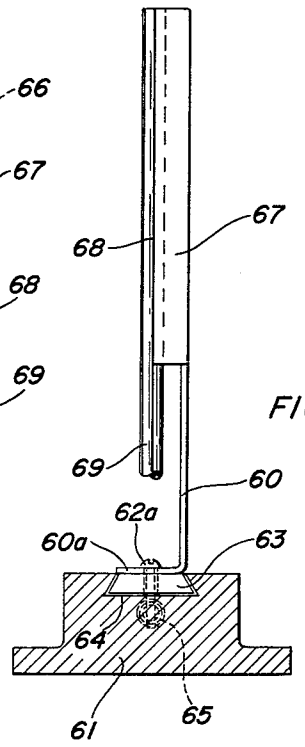
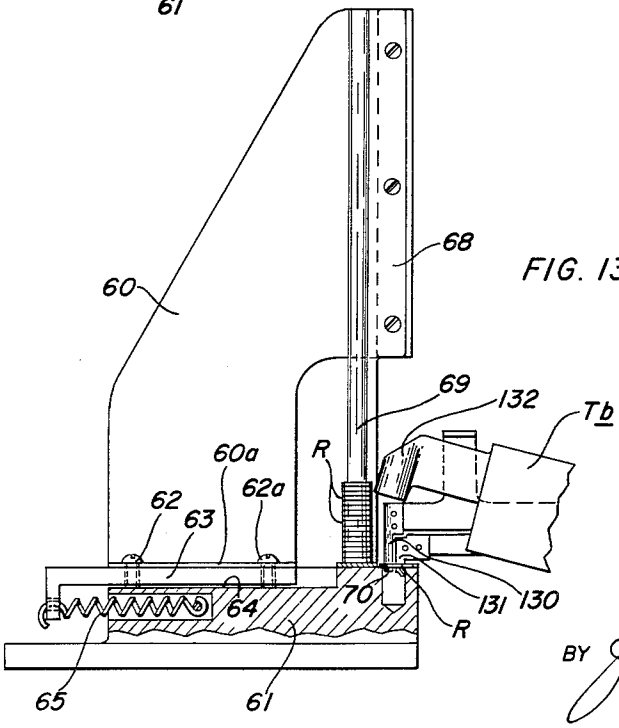


FIG. 13



INVENTOR
HANS ERDMANN
BY J. Harold Kiesow
ATTORNEY

United States Patent Office 3,092,287 Patented June 4, 1963

3,092,287

DISPENSING APPARATUS FOR SPRING RETAINING RINGS

Hans Erdmann, Maplewood, N.J., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y., a corporation of New York

Filed July 12, 1960, Ser. No. 43,270
14 Claims. (Cl. 221—189)

This invention relates to improvements in dispensing apparatus for spring retaining rings and more particularly in dispensers for dispensing split or open-ended spring retaining rings of the type adapted, when spring-seated in the groove of a cylindrical workpiece or carrying member, to provide an artificial locating shoulder thereon; and further in dispenser-tool combinations employing the improved dispenser as herein contemplated. The present application is a continuation-in-part of my prior application Serial No. 835,276, filed August 21, 1959 (now abandoned).

As is well known, split spring retaining rings are now used extensively in all branches of industry, and thus it is a practical necessity to provide dispensers which mount a readily available supply of the rings in readiness to be dispensed, from which they can be withdrawn one by one as needed. Usually, the dispenser mounts its supply of retaining rings in vertical column formation on a vertically disposed stack rod and with the lowermost ring of the stack being free of said stack rod for withdrawal by a tool of a type adapted to grip said lowermost ring about its outer edge with the requisite force as to free it from the next higher ring and the weight of all of the rings above the latter. Conventionally, such a tool may also be employed in subsequently handling and assembling the withdrawn ring on its grooved shaft, the latter as by positioning the tool in the plane of its groove and pushing the ring over the shaft directly into the groove.

However, there are numerous ring applications and required modes of ring assembly which make the use of other forms of ring withdrawing and assembling tools desirable, if not necessary. For example, if a particular ring application requires that the ring must be assembled by spreading it over the end of its shaft and shifting it axially therealong to the plane of its groove, the well known pliers-type tool is employed for the assembly operation, since such a tool is provided with working points which are adapted to be inserted into the apertures provided in the ends of the ring for this purpose, and hence it is capable of picking up and holding, and thereupon spreading, said ring over the end of the shaft on which its assembly is to be effected. A more modern type of pliers tool capable of being used for this purpose is that shown in my pending application Serial No. 817,668, filed June 2, 1959, now Patent No. 3,015,882, dated January 9, 1962, wherein the working ends of the tool, rather than being formed with tips as heretofore, are instead formed as a push head and a spreading head, respectively, the push head responsive to closing of the tool arms being adapted to push a ring positioned between said heads axially along the spreading head and, in so doing, to spread it the diameter of and thence over the end of the shaft on which the ring is to be assembled.

However, use of these plier-type tools to effect withdrawal of the lowermost ring of a vertical column of such rings maintained on a dispenser stack rod has not been possible heretofore with existing ring dispensers. Such follows from the fact that existing ring dispensers fail to make adequate provision for clearance of the plurality of rings of the column which are disposed just above the lowermost ring thereof (which as a matter of practical necessity is always the ring which is dispensed) during the course of each ring withdrawal operation, as is necessary for the plier-head or the working points of a pliers-type tool moving into proper position with respect thereto as enables said tool to pick up said lowermost ring preliminary to its withdrawal. Thus, there exists in the particular art the need for a retaining ring dispenser of the type which maintains its supply of rings in a vertical stack or column, and which at the same time is designed to make the lowermost ring of the stack accessible to a pliers-type tool whose ability to withdraw the lowermost ring of the column depends in the first instance on its ability to move against said lowermost ring from a face side thereof, rather than on its ability to grip the ring along its outer edge.

Stated broadly, an object of the invention is the provision of a vertical stack rod form of dispenser capable of satisfying this need and which is accordingly characterized by a construction which is adapted to make the lowermost ring of a vertical column thereof accessible to a pliers-type ring withdrawing and assembly tool, thereby enabling said tool to pick up said lowermost ring and remove it from the dispenser for its subsequent assembly on a cylindrical shaft or similar workpiece.

A more specific object of the invention is the provision of a dispenser incorporating positive means for making the lowermost ring of the stack thereof accessible to a pliers-type withdrawing and assembly tool as aforesaid, which means is so constructed and arranged as to be operable by the tool itself responsively to its movement toward the dispenser to ring pick-up position.

Yet another object of the invention is the provision of a dispenser of the character described, wherein the ring-accessibility feature is made possible by the use of a stack rod which can be bodily moved from its normal or active position to an inactive position in which it presents the lowermost ring of the ring stack to the action of the pliers-type withdrawing tool, responsively to movement of said tool to its ring pick-up position.

A more particular object of the invention is the provision of a retaining-ring dispenser as last described, wherein the return movement of the stack rod from its inactive to its normal position is utilized to condition the dispenser for the next ring-withdrawing operation.

Yet another object of the invention is the provision of alternate practical embodiments of retaining ring dispensers operating on the basic principle of the present invention as explained above, and which at the same time are sufficiently flexible as to be actuable by any of the various pliers-type ring withdrawing tools which are adapted to grip a ring to be withdrawn by movement of a tool part against a face of the ring, rather than by gripping the ring along its outer edge.

The above and other objects and features of advantage of the invention will, it is believed, be clear from the following detailed description thereof, in which reference is made to the accompanying drawings illustrating various forms which the herein proposed dispenser may take, in which:

FIG. 1 is a perspective view of one form of movable stack-rod dispenser according to the present invention shown in the process of being operated by a pliers-type ring withdrawing and applying tool of the type disclosed and claimed in my aforesaid Patent No. 3,015,882;

FIGS. 2, 3 and 4 are top plan, front and side views, respectively, of the dispenser shown in FIG. 1, with the stack rod thereof being disposed in normal or active position;

FIG. 5 is a section along line 5—5 of FIG. 3;

FIG. 6 is a top plan view corresponding to FIG. 2 but illustrating the stack rod in its retracted or out-of-the-way position in which it is also shown in FIG. 1;

FIG. 7 is a view similar to FIG. 1, which is intended to

illustrate the ability of the dispenser therein shown of being operated by the more conventional pliers-type retaining ring assembly tool having working points adapted to be inserted into the aperture of the end ears or lugs in which the open ends of spring retaining rings are usually formed;

FIGS. 8–10 inclusive illustrate another form of movable stack-rod type of retaining ring dispenser according to the present invention, of which FIG. 8 is a side elevation thereof, partly in section;

FIG. 9 is a fragmentary top plan view thereof; and

FIG. 10 is a view similar to FIG. 8 but illustrating the dispenser being operated by a more advanced design of pliers-type withdrawing and applying tool as disclosed and claimed in my application Serial No. 19,207, filed April 1, 1960, now Patent No. 3,073,014, dated January 15, 1963; and

FIGS. 11–13 illustrate yet another form of movable stack-rod type of retaining ring dispenser according to the invention, of which FIG. 11 is a side elevation thereof, partly in section;

FIG. 12 is a section taken along line **12—12** thereof; and

FIG. 13 is a view similar to FIG. 11 but illustrating the dispenser being operated by a hand tool similar to that shown in FIG. 10.

Referring to the drawings in details, FIGS. 1–6 inclusive illustrate a form of dispenser according to the invention which maintains its supply of retaining rings in vertical column formation and is designed to make the lowermost ring thereof accessible to a withdrawal (and assembly) tool of the type adapted to engage said lowermost ring responsive to its movement against a face thereof, i.e. its top face, by bodily movement of the stack rod and all rings thereon to an out-of-the-way position relative to said lowermost ring. Illustratively, such a dispenser comprises a block-form base **10** having an elevated forward portion whose top surface is horizontally disposed. Pivotally secured to said base so as to swing in a horizontal arc across its said top face, as by a pivot pin **12**, is a two-arm lever **13**. To the forward arm **13***a* of said lever which normally extends along the front of the base **10** is fastened, as by rivets **14**, **14***a*, an upright right-angled bracket **15** whose rearwardly disposed flange is formed thin as at **16** and extends as a rearwardly disposed, blade-like part **17** to which a vertical stack rod **18** is affixed. Such a stack rod is preferably formed of two cylindrical half-sections **18***a*, **18***b* of stiff material such as metal, which are secured flush against the side faces of the said blade-like part **17**, as by pins or rivets **19***a*, **19***b*, and thus the stack rod is of rigid construction throughout. The stack rod terminates at its lower end just above the top surface of the base so as to be freely movable thereover.

As best seen in FIGS. 2 and 6, the other lever arm **13***b*, which is disposed at a right angle to the aforesaid lever arm **13***a*, extends rearwardly over the horizontal top face of the base **10**. The lever **13** as a whole, and hence the stack rod **18** carried by the latter, are maintained in the normal or operative position by means of a spring **20** connected to and extending between the rearward end of the lever arm **13***b* and a fixed stud **21** or other fixed point on the base **10**. The normal position of the lever and stack rod is determined by a stop bolt **22** whose axial position may be adjusted by a thumb screw **23**, such functioning to provide a fine adjustment of the normal or working position of the stack rod **18**. Due to the pivotal mounting of the lever, and hence of the stack rod **18**, the latter may be moved bodily to a retracted position responsive to swing movement in clockwise direction imparted to said lever **13**.

Sunk into the top surface of the base **10** at a location thereon which directly underlies the stack rod **18** is a shallow ring recess or pocket **24** of depth corresponding to the axial thickness of one of the rings to be dispensed and being configured along its edges to accurately complement the outline of a ring being dispensed turned so that its gap faces forwardly. The arrangement so far described is thus one in which the stack rod normally positions the lowermost ring of the stack thereof which if carries in the so-called withdrawal readiness position in the pocket **24**, but it is free bodily to move or retract relatively rearwardly therefrom, thus to move all of the rings of the stack, except the said lowermost ring, rearwardly away from said pocket, and thereupon to partake of return movement to its aforesaid normal position.

As best seen in FIG. 3 and 5, the dispenser base **10** is formed in its front face with a large-diameter cut-out **26** which teminates at its upper end short of the ring pocket **24**, but is connected thereto by an opening **27** having substantially less diameter than that of said pocket. Thus, the ring pocket **24** is separated from the cut-out **26** by an apertured wall which defines the bottom of the ring pocket, but it is accessible from below through said opening **27** so that a ring becoming stuck in the pocket may be readily dislodged from same.

As forecast above, the dispenser according to FIGS. 1–6 is particularly suited to be operated by a pliers-type retaining ring assembly tool according to my aforesaid Patent No. 3,015,882. Such a tool, which is generally designated T, FIG. 1, comprises two pivotally interconnected arms **30**, **31** extending forwardly from a handle member **32**. The arm **30**, which is normally the upwardly disposed arm, mounts at its forward or working end a so-called ring push-head **33**, and the companion arm **31**, which is normally the lower arm, mounts at its forward or working end a frusto-conical spreading head **34**, the smaller-diameter end of which preferably has a diameter slightly less than the free or unstressed inner-edge diameter of the rings being assembled, and whose larger-diameter end has a somewhat greater diameter which corresponds substantially to that of the shaft on which ring assembly is to be effected.

As explained in my aforesaid application, such a tool is adapted to pick up a ring to be assembled from a horizontal supporting surface by inverting the tool so that the smaller-diameter end of the spreading head **34** is downwardly disposed, and thereupon, with arms spread, moving said head downwardly on to the ring to be assembled so that said smaller-diameter end moves into the opening of the ring. Then, by exerting slight downward pressure of the spreading head **34** against the ring, the latter frictionally grips itself to said small-diameter end of the spreading head. Thereupon, responsive to movement of the tool arms towards one another, the ring pushhead **33** actuates the so held ring axially along the spreading head, which movement effects its spreading to the diameter of the shaft or workpiece on which it is to be assembled.

Assuming the stack rod **18** and its supply of rings R of a dispenser according to FIGS. 2–4 inclusive to have moved rearwardly from the ring pocket **24**, such a pliers-type retaining ring assembly tool as just described may be employed to pick up the lowermost ring of the stack then positioned in the ring pocket **24** thereof simply by moving the tool with its arms spread into a position such that the tool spreading head **34** is disposed slightly above the ring pocket, the ring push-head **33** being meantime accommodated in the front-face cut-out **26** provided therefor in the dispenser base **10**, and thereupon pressing the spreading head downwardly into gripping engagement with the inner edge of the pocketed ring. The movable mounting of the stack rod **18** as described above of course makes this desirable pick-up operation possible.

According to another feature of the invention, retracting movement of the stack rod **18** and its supply of the rings to be assembled to the rearward or inactive position as aforesaid is effected by the movement of the tool T into its aforesaid ring pick-up position. Such may be simply achieved by attaching to the bracket **15**, just forwardly of the stack rod **18**, a concave push head **36** positioned so as to be capable of guiding the tool T toward

the stack rod and at the same time receive the thrust of the spreading head **34** of said tool upon the latter moving to ring pick-up position aforesaid. That is to say, during the initial movement of the spreading head **34** to pick-up position, it engages against the guide head **36**, whereupon tool thrust is utilized to actuate the stack rod and its supply of retaining rings to the retracted position. Upon the tool picking up the ring from the dispenser pocket **24** and withdrawing same bodily from the dispenser, the aforesaid spring **20**, which has been extended by movement of the stack rod to its retracted position, releases its energy in returning the stack rod to its normal operative position. Such results in the now lowermost ring of the column thereof on the stack rod dropping into the ring pocket **24** of the dispenser base, thus conditioning the dispenser for the next ring-dispensing operation.

As indicated in FIG. 7, it is also possible to operate the aforesaid dispenser in the described manner by means of the more conventional pliers-type ring withdrawing and applying tool T*a* shown in FIG. 7. As is well known, such a tool is provided with working points *a* and *b* which are angularly bent out of the plane of the working tips or ends of the tool arms proper and are designed to be inserted into the apertures of the ears with which the free ends of split spring retaining rings of the type under consideration are usually formed. Obviously, this form of pliers-type tool can be engaged with a ring to be assembled for pick-up purposes only by movement of its working points against a face of the ring, generally as with the pliers-type tool illustrated in FIG. 1, for example. The dispenser as described is suited to being operated by the pliers-type tool shown in FIG. 7 equally as with the tool T of FIG. 1, since the working points *a*, *b* thereof may be simply thrust against the bracket **15** with enough force to effect retraction of the stack rod **18** as a whole together with its supply of rings rearwardly away from the ring then contained in the ring pocket **24**, whereupon the working points of the tool may be pressed into the ring-end apertures and the ring withdrawn in well known manner. Consequent to this withdrawal, the retracted stack rod **18** and column of rings thereon moves back to its normal position and, in partaking of this movement, drops a ring from the stack into the ring pocket, thus conditioning the tool for the next ring-withdrawing operation.

Referring to FIGS. 8–10, illustrative of another form of movable stack-rod dispenser according to the invention, characterized in that its stack rod is mounted to bodily retract by swinging about a horizontal axis rather than about a vertical axis as in the prior described modification, reference numeral **40** designates an upright bracket having a foot flange **40***a* which is preferably affixed to the dispenser base **41** as by screws **42**, **43**. Hingedly connected to the upper end of such bracket as by a horizontally disposed and transversely extending pivot pin or rivet **44** is a downwardly extending arm **45**, which is thus adapted to swing in a vertical fore and aft plane with respect to the base **41**. As best seen in FIG. 9, the arm **45** is shaped as a U and is arranged so that its bottom or cross wall **46** is forwardly disposed and a side flange **47** thereof extends rearwardly, to which latter is secured as by screws **48**, **48***a*, **48***b* a vertically disposed thin blade **49** which mounts the stack rod **50**, similarly to the way that the blade **17** of the prior described dispenser mounts the stack rod **18** thereof. As with the aforesaid blade **17**, the thin blade **49** of the present dispenser form is accommodated in the gaps of the rings R threaded on to the stack rod **50** and hence serves the very important purpose of maintaining the stack of rings carried by the stack rod in exact alignment and with their gaps facing or opening in forward direction.

Preferably there is secured to the top face of the base **41** below the stack rod **50** a flat, smooth- surfaced plate **51** having thickness corresponding to the axial thickness of one of the rings R, and formed in said plate is a recess **52** shaped to the general outer-edge configuration of a ring R and being disposed immediately below the stack rod in the vertical or active position of the latter to which it is biased by a spring **53**, said recess thus providing an upwardly opening ring pocket for the lowermost ring of the stack. Below said pocket, the base **41** is provided with a cut-out **54** which is shown to be closed at its bottom end and in communication at its upper end with the ring pocket, whereby it may accommodate a part or parts of a ring withdrawing and applying tool T*b* of the type partially shown in FIG. 10.

Illustratively, such tool T*b* is of the advanced type of ring-handling pliers which is disclosed and claimed in my application Serial No. 19,207, filed April 1, 1960, being characterized principally by a ring spreading mandrel comprising separable tip members **130**, **131**, which normally has diameter slightly less than that of the ring opening whereby it may be more or less freely inserted into said opening preliminary to gripping a ring along its inner edge and thereupon spreading said ring by spreading of its tip members, and a generally annular push-head **132** adapted to push the spread ring axially from the mandrel on to and over the end of a shaft to the plane of the groove thereof in which it is to be assembled. It will of course be understood that the form of dispenser under discussion is not limited to operation by a pliers-type ring withdrawing and applying tool as just described since a dispenser according to the invention may be operated by practically any type of hand tool which grips a ring by movement of one or more of its tool parts against a face of the ring, as distinguished from gripping said ring along its outer edge.

The operation of a dispenser according to FIGS. 8–10 inclusive is quite similar to that of the previously described dispenser. More particularly, to withdraw a ring, the tool T*b* is moved or thrust rearwardly against the ring stack, such causing the lower end of the stack rod **50** to swing bodily rearwardly about the axis of pivot pin **44**. Such renders the lowermost ring R of the stack, which has previously dropped into the ring pocket provided by the recess **52**, accessible to the tool T*b* and thereupon the mandrel **130**, **131** thereof is lowered in the opening of said pocketed ring, following which it is spread to grip the ring about its inner and/or gap edges. After the tool has picked up the ring and consequent to its being withdrawn from engagement with the stack rod **50** and/or rings stacked thereon, the stack rod returns to its active position under the bias of the aforesaid spring **53**.

According to the further embodiment of movable stack-rod dispenser illustrated in FIGS. 11–13 inclusive, an upright stack-rod mounting bracket **60** extends upwardly from a base **61** and is affixed as by screws **62**, **62***a* passing through its foot flange **60***a* to a slide **63** of dove-tail cross section which is slidable rearwardly and forwardly in a correspondingly shaped, upwardly opening slideway **64** sunk into the upper face of said base, said slide being movable rearwardly against the bias of a spring **65** and being returnable to its normal or active position by said spring. The upper portion of the bracket **60** is preferably formed to U-shape and to the free vertical flange **67** thereof is affixed a thin blade **68** which carries a rigid stack rod **69**, all as previously described in connection with the prior embodiments. When a pliers-type hand tool T*b*, which illustratively is the same tool shown in FIG. 10, is thrust against the stack rod, the latter together with the slide **64** moves bodily in rearward direction, thus to render the lowermost ring of the stack then disposed in a ring pocket **70** (corresponding to the afore-described pocket **52** of the FIGS. 8–11 embodiment) accessible to the tool. When said ring has been picked up, the tool is backed away from the stack rod, whereupon the latter returns to its forwardmost or active position under the urge of the spring **65**.

While each of the different structural forms of movable

stack-rod type of retaining ring dispenser which have been described and illustrated herein satisfies the objectives of the invention as explained in the foregoing in fully effective and dependable manner, it is to be understood that numerous changes can be made in carrying out the above constructions without departing from the scope of the invention, and it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A Retaining ring dispenser for split retaining rings comprising, in combination, a base, a rigid stack rod mounted on and extending substantially normally from said base for disposing a supply of spring retaining rings to be dispensed in column formation thereon, a pocket in said base for receiving and holding the endmost ring of the column lowering thereinto from the stack rod in withdrawal-readiness position, means responsive to movement of a ring pickup and withdrawal tool against the lower end of the ring column and/or stack rod for moving the stack rod as a whole bodily away from said endmost ring contained in said pocket by an amount exposing substantially the entire relatively upwardly disposed face of said ring to the action of the tool, and means for effecting return movement of the stack rod to its initial position.

2. A retaining ring dispenser substantially as defined in Claim 1, wherein said stack rod has a normal position in which it is aligned axially with the pocket but is mounted so as to be movable bodily to a retracted position in which it is non-aligned with said pocket and thereby renders the pocketed ring accessible to the ring pickup and withdrawing tool as aforesaid.

3. A retaining ring dispenser for split retaining rings comprising, in combination, a base, a rigid stack rod extending substantially normal from said base for disposing a supply of retaining rings to be dispensed in column formation thereon, a pocket in said base for receiving and holding the endmost ring of the column lowering thereinto from the stock rod in withdrawal-readiness position, means mounting said stack rod in such manner that it is normally axially aligned with said pocket but is bodily movable as a whole to a non-aligned position with respect to the pocket in which it exposes substantially the entire relatively upwardly disposed face of said endmost ring to the action of a ring pick-up tool of a type depending for its action on its ability to move against a face of a ring, and means for effecting return movement of the stack rod to its normal position following each ring pickup operation.

4. A retaining ring dispenser substantially as defined in claim 3, wherein said stack-rod mounting means provides for bodily swinging movement of said stack rod as a whole about an axis extending parallel to that of the stack rod.

5. A retaining ring dispenser substantially as defined in claim 3, wherein said stack-rod mounting means provides for bodily swinging movement of said stack rod as a whole about an axis extending transversely of the stock rod.

6. A retaining ring dispenser substantially as defined in claim 3, wherein said stack-rod mounting means includes a slide operating in a fore-and-aft extending slideway formed in the top face of the base, to which said stack rod is affixed for bodily movement as a whole therewith.

7. A retaining ring dispenser substantially as defined in claim 3, wherein said stack-rod mounting means comprises an upright bracket having an edge part to which the stack rod is affixed, and pivot means providing for pivotal movement of the bracket and thereby the stack rod as a whole with respect to the base.

8. A retaining ring dispenser substantially as defined in claim 7, wherein the pivot means is operative between the bracket and the base.

9. A retaining ring dispenser substantially as defined in claim 3, wherein said pocket comprises an upwardly opening recess sunk into the upper face of the base and being configured substantially complementally to the outer-edge configuration of the rings of the column thereof.

10. A retaining ring dispenser substantially as defined in claim 3, wherein a plate member is affixed to the top face of the base intermediate said face and the stack rod, said plate member having thickness corresponding to that of one of said rings and being provided with an opening which is configured substantially complementally to the outer-edge configuration of the rings of the column thereof and which defines said pocket.

11. The combination of a dispenser for maintaining a supply of split spring retaining rings and a tool for withdrawing and assembling said rings one by one, said dispenser comprising a base, a rigid stack rod extending substantially normally upwardly from the base for disposing the supply of rings in column formation on said base, and a pocket in said base for receiving the endmost ring of said column lowering thereinto from said stack rod and positioning same in withdrawal-readiness position, said tool incorporating ring pick-up means which depends for its action on its ability to move against a face of a ring, and means mounting said stack rod for bodily retracting movement to an out-of-the-way position in which it exposes substantially the entire relatively upwardly disposed face of said ring to said tool responsively to thrust of a part of said tool against its lower end, thereby to render said endmost ring positioned in the ring pocket accessible to said pick-up means.

12. The dispenser-tool combination defined in claim 11, wherein said stack-rod mounting means mounts said stack rod for bodily swinging movement about an axis disposed parallel to its own axis.

13. The dispenser-tool combination defined in claim 11, wherein said stack-rod mounting means mounts said stack rod for bodily swinging movement about an axis extending transversely thereof.

14. The dispenser-tool combination defined in claim 11, wherein said stack-rod mounting means comprises coacting slide and slideway means on said base enabling the stack rod to slide rearwardly and forwardly thereon.

References Cited in the file of this patent

UNITED STATES PATENTS

1,244,094	Johnson	Oct. 23, 1918
2,701,722	Bone	Feb. 8, 1955
2,840,892	Erdmann	July 1, 1958
2,870,529	Erdmann	Jan. 27, 1959
2,895,214	Erdmann	July 21 ,1959
2,900,107	Erdmann	Aug. 18, 1959
2,930,114	Erdmann	Mar. 29, 1960
2,985,295	Erdmann	May 23, 1961

FOREIGN PATENTS

523,365	Belgium	Oct. 31, 1953

OTHER REFERENCES

German application 1,004,140, printed March 14, 1957 (Kl. 11–*e*).