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(19)



(54) IMPROVEMENTS IN OR RELATING TO DISPENSERS

(71) We, WALDES KOHINOOR INC., of 47—16 Austel Place, Long Island City, New York, 11101, United States of America, a corporation organized and existing under the laws of the State of New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to dispensers for dispensing external spring retaining rings of the type designed for radial assembly in shaft and spindle grooves.

Dispensers are used for dispensing clip-type retaining rings, one at a time as needed, from a supply thereof maintained in a spring-loaded stack or column thereof on an elongate dispenser-provided magazine rail, and are capable of being "operated" by the same leverage-advantage type hand manipulable tool known as an applicator which is later employed to assemble each so-dispensed ring in its groove. By the term "operated" as just used and when used hereinafter in the same context is meant the acts or sequence of acts of manually co-operating the gripping jaws of the applicator with the endmost ring of the stack thereof then in the so-called "dispense-ready" position, and of thereupon picking off and withdrawing said endmost ring from the stack by bodily withdrawing the tool and ring gripped thereby from the dispenser.

As is well known, external spring retaining rings designed for so-called radial assembly in their grooves are characterized by a relatively wide gap between their open ends, i.e. a width of gap either actual or effective which is only slightly less than the diameter of the circle of the groove bottom, as enables such ring to be assembled by a straight push or thrust force applied to the outer-edge portion thereof disposed generally opposite its said gap as causes the ring to move against the shaft in the plane

of the groove and finally to spring-seat itself against the groove bottom.

According to the present invention, there is provided a dispenser for radial assembly-type spring retaining rings adapted to be "operated" by the same hand-manipulable applicator employed to effect their installation in shaft or spindle grooves and which applicator includes an elongate rigid strap member and an applicator blade mounted substantially flush against the relatively under face of said strap member and which terminates at its working end in arcuate grip jaws having ring-edge backing flanges disposed in slightly offset relation and in the direction of said strap-member face from the plane of the grip jaws and wherein said grip jaws when pushed against the outer edge of a retaining ring are adapted to grip said ring preliminary to withdrawing same from the dispenser and which grip-jaws terminate at a position spaced apart from the corresponding end of the strap member of the applicator, the dispenser comprising:

an elongate magazine rail for securing a supply of the rings to be dispensed in column formation thereto while permitting feed movement of the column therealong;

a support for said magazine rail;

a ring-column stop member extending transversely across one end of the rail;

spring-feed means for feeding the column of rings longitudinally along said rail in the direction of said column-stop member;

said rail being devoid of its ring-securing property for a short length portion thereof disposed immediately adjacent said column-stop member and whose length is substantially equal to the axial thickness of one ring of the column thereof;

and means providing a guide channel for an applicator as aforesaid which extends transversely through the dispenser and is disposed relatively beyond said magazine-rail end, the width of said guide channel for its length portion extending between its entrance end and said ring-column stop

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member being substantially equal to the combined thickness of the strap member and applicator blade, and the width of the channel throughout its remaining length portion being substantially equal to the thickness of the strap member only, the construction and arrangement being such that when the applicator turned on edge and with the applicator blade facing the ring column is inserted in and pushed rearwardly along the guide channel, the grip jaws of the applicator blade will move against and grippingly engage the endmost ring of the column thereof along a portion of its outer edge, the end portion of the strap member which extends beyond said grip jaws being meanwhile accommodated in said remaining length portion of said channel, and that responsive to subsequent withdrawal movement of the applicator from the channel the so-gripped ring is picked off from the magazine rail and withdrawn from the dispenser.

An embodiment of the invention will now be more particularly described with reference to the accompanying drawings, in which:—

Figure 1 shows a front elevation of a dispenser embodying the invention;

Figure 2 shows a plan view of the dispenser shown in Figure 1 as viewed from the top thereof;

Figure 3 shows an end elevation of the dispenser shown in Figs. 1 and 2, with parts broken away to better show the details of the working end of the dispenser;

Figure 4 shows a fragmentary perspective view of the working end of the dispenser and the working end of a leverage-advantage type applicator during the course of its movement towards the dispenser to effect a ring dispensing, i.e. ring pick-off and withdrawing operation; and

Figures 5 and 6 show fragmentary detail views, of which Figure 5 illustrates the section of the magazine rail and the manner in which clip-type rings hold thereto during the course of their spring-loaded movement towards their dispense-ready position, and Figure 6 illustrates preferred configurations of the ring-column stop member mounted at the end of the magazine rail towards which the rings to be dispensed are fed and also of the magazine rail proper both along its major length portion and at the end thereof immediately adjacent said column stop member.

Figs. 1, 2 and 3 show three views of a dispenser which comprises an elongated generally rectangular base casting 10 formed with a preferably upright rail support 12 which extends longitudinally along the relatively rearward edge of said base casting, said rail support having secured to its top edge as by spaced-apart screws 14 an elong-

ate magazine rail-providing member 16 disposed in forwardly overhanging relation with respect to the upright rail support and whose forward side edge is formed with T-section, thus to constitute the magazine rail proper 18 of the dispenser on which a supply of clip-type retaining rings R to be dispensed are disposed in face engagement and in elongate stack or column formation. As best shown in phantom in Figure 1, the aforesaid column of rings is spring-loaded toward the left end of the magazine rail 18 (as viewed in Figures 1 and 2), from which the rings are ultimately to be dispensed, by a spring-feed means shown to comprise a follower 20 riding on said magazine rail and an elongated coil spring 22 connected at one end to said follower and being trained around a shoulder screw 24 threaded into the front face of the upright 12 and from thence extending generally back on itself and having its other end fixedly secured to said upright as by a screw 26.

Secured as by screws 28 (Figure 3) to that end of the rail-providing or forming member 16 towards which the ring column moves under its aforesaid spring loading is a ring-column supporting and stop member generally designated 30. By reference to Figures 4 and 6, it will be seen that said stop member is of one-piece construction and has elongated L-section, with one (the longer) arm 32 of the L providing a plate-form member which extends transversely across the dispensing end of the aforesaid magazine rail members 16 and 18, and the other arm 34 of the L being set into a machined recess provided therefor in the end of the rail-providing member 16 and being therein secured by the aforesaid screws 28. Consequent to said arms 32, 34 having different thickness, there is provided on the rail and ring-column side of the L member the forwardly facing step or shoulder 36 which is disposed directly to the rear of each then endmost ring of the column thereof and is further set back from the rail proper 18 by an amount such that it is capable of serving as a back-up surface for said endmost ring during the course of the latter being gripped along its forward outer edge portion by the applicator as a preliminary to its being withdrawn from the dispenser.

The magazine rail 18, rather than extending fully to the stop plate-providing arm 32, is instead effectively terminated short thereof by an amount slightly greater than the axial thickness of one ring of the column thereof to be dispensed. Such effective termination of the rail may be achieved by the simple procedure of removing, by cutting or grinding away as at 18a, 18b (Figure 6) the free end of the cross bar of

the T which provides the rail proper, which ends normally secure the rings feeding along the magazine rail by their projection into the ring interior spaces relatively behind the spaced-apart inner-edge projections p_1 , p_2 which are defined in the rings shown by the intersections of the concentric inner edges of their diametrically opposed segmental grip jaws and the adjacent sharply receding inner arcuate edges at the ends of the bending arm portions of such rings, all as illustrated in Figure 5 in particular.

An applicator for "operating" the dispenser is shown in Figure 4 and comprises an applicator blade 50 mounted substantially flush against the relatively under face of an elongate bar or strap member 52 having a hook formation 54 at its one end which projects a substantial distance beyond the arcuate ring grip-jaws 56a, 56b and the ring-edge backing flanges 58a, 58b of said applicator blade, it will be appreciated that the dispenser must be provided with applicator guide means serving to guide both the grip-jaw provided-end of the applicator blade and the (projecting) end of the hook member into the dispenser to a position in which the grip-jaws of the applicator blade will align with and grippingly engage the endmost ring of the column thereof preliminary to withdrawing same from the dispenser and also to accommodate for the longer hook-provided end of the hook member 52.

Illustratively, such applicator guide means is provided by a front-to-rear end upright 60 which is preferably cast integrally with the base 10 and whose height is approximately 30% greater than that of the aforesaid upright 12 which extends along the rear wall of the base casting. On its side facing the magazine rail and associated parts, said end upright 60 is provided with a horizontal step 62 which extends completely thereacross, and to its same side but below the aforesaid step 62 is secured as by screws 64 a guide plate 66 of height such that its upper edge is at about the same level as that of the end upright 60. By such arrangement there is provided an upwardly opening applicator-guide channel C which extends fully across the end of the dispenser from which the rings are dispensed, which channel is defined on its sides by the facing inner-side walls of the end upright 60 and the guide plate 66, and on its bottom by the horizontally extending, upwardly facing step 62 formed on the end upright as aforesaid. The width of said channel C for the length portion thereof extending from its forward entrance end to the forward edge of the aforesaid column-stop member 30 is greater by only a few thousandths of an inch than the combined thickness of the applicator blade and its backing strap mem-

ber, and the channel-bottom defining step 62 is at a level as to support an applicator turned on edge, as in Figure 4, upon insertion thereof in said channel through its entrance end (which insertion is facilitated by the radiused corner 68 between the front wall of the upright and said step 62) at a level such that its longitudinal centre line is disposed in the same horizontal plane as that containing the centre line of each then endmost ring of the column thereof maintained on the magazine rail 18.

Moreover, the width of the channel portion rearwardly of the forward edge of said column stop member 30 is such as to accommodate only the leading end of the strap member 52 which extends beyond the applicator-blade grip jaws 56a, 56b. This narrowing of the channel C is provided by the column stop member 30 whose longitudinally extending, vertical plane surface which faces the channel-defining side wall of the end upright 60 co-operates with said upright side wall in providing the channel sides for the narrower rearward length portion of the channel.

The thickness of the forwardly disposed plate-form portion 32 of said column stop member is substantially equal to that of the ring-edge backing flanges 58a, 58b with which the grip jaws 56a, 56b of the applicator blade are provided and which, as is conventional, are slightly offset from said grip jaws in the direction of the hook member 52. Moreover, the position of the column stop member 30 longitudinally of the magazine rail 18 is not only such as will dispose its plate-form portion 32 in substantially exact longitudinal alignment with said ring-edge backing flanges of the applicator blade, but also will dispose the forward vertical edge of said plate-form portion in a position just short of the forwardmost position which the end edges of the grip jaws and the ring-edge backing flanges will assume in picking off the endmost ring of the ring column from said magazine rail 18.

It will be appreciated that the described arrangement of parts provides not only that the longitudinal centre line of an applicator inserted in the dispenser channel C provided for its reception will be disposed in the same horizontal plane as that containing the centre line of each then endmost ring R of the column thereof maintained on the magazine rail 18, but also that the portion 32 of the ring-column stop member 30 operates as to insure that the ring grip jaws 56a, 56b of the applicator blade will invariably move in the vertical plane of said endmost ring as is necessary to the grip jaws performing in their most effective manner.

Upon the applicator-blade grip jaws 56a, 56b having fully gripped the said endmost

ring of the column thereof maintained on the magazine rail in response to push force exerted thereon through the handle end of the applicator blade, withdrawal of the gripped ring is effected by reverse movement of the applicator along the channel C as results in withdrawal of said endmost ring, as is permitted by the aforementioned removal of the free ends of the cross bar of the T-shaped rail. Upon complete withdrawal of said ring having been effected, the next ring of the column thereof moves to the dispense-ready position on the rail in response to the spring loading of said column.

Various adjustments of dispenser parts and/or positioning thereof as may be necessary or considered to be advisable for the purpose of adapting the dispenser to the dispensing of various sizes of rings and to be operated by varying sizes of applicators are possible. More particularly, one or more shims 70 may be interposed between the guide plate 66 and the surface of the end upright to which said guide plate is secured, thus to vary the width of the guide channel so as to adapt it to various thicknesses of applicator. On the other hand, if the dispenser is intended only for constant applicator thickness, the entire applicator guide channel can be formed of one piece rather than being formed by plural parts as described. The magazine rail and supporting part from which it extends may be interchanged with corresponding parts but of different-size rails, etc. as may be required for the dispensing of various sizes of rings as aforesaid.

WHAT WE CLAIM IS:—

1. A dispenser for radial assembly-type retaining rings adapted to be "operated" by the same hand-manipulable applicator employed to effect their installation in shaft or spindle grooves and which applicator includes an elongate rigid strap member and an applicator blade mounted substantially flush against the relatively under face of said strap member and which terminates at its working end in arcuate grip jaws having ring-edge backing flanges disposed in slightly offset relation and in the direction of said strap-member face from the plane of the grip jaws and wherein said grip jaws when pushed against the outer edge of a retaining ring are adapted to grip said ring preliminary to withdrawing same from the dispenser and which grip-jaws terminate at a position spaced apart from the corresponding end of the strap member of the applicator, the dispenser comprising:
 - an elongate magazine rail for securing a supply of the rings to be dispensed in column formation thereto while permitting

feed movement of the column therealong; a support for said magazine rail;

a ring-column stop member extending transversely across one end of the rail; spring-feed means for feeding the column of rings longitudinally along said rail in the direction of said column-stop member;

said rail being devoid of its ring-securing property for a short length portion thereof disposed immediately adjacent said column-stop member and whose length is substantially equal to the axial thickness of one ring of the column thereof;

and means providing a guide channel for an applicator as aforesaid which extends transversely through the dispenser and is disposed relatively beyond said magazine-rail end, the width of said guide channel for its length portion extending between its entrance end and said ring-column stop member being substantially equal to the combined thickness of the strap member and applicator blade, and the width of the channel throughout its remaining length portion being substantially equal to the thickness of the strap member only, the construction and arrangement being such that when the applicator turned on edge and with the applicator blade facing the ring column is inserted in and pushed rearwardly along the guide channel, the grip jaws of the applicator blade will move against and grippingly engage the endmost ring of the column thereof along a portion of its outer edge, the end portion of the strap member which extends beyond said grip jaws being meanwhile accommodated in said remaining length portion of said channel, and that responsive to subsequent withdrawal movement of the applicator from the channel the so-gripped ring is picked off from the magazine rail and withdrawn from the dispenser.

2. A dispenser as claimed in claim 1, wherein said guide channel is defined in part by an upwardly facing bottom wall adapted to support the applicator moving through the channel in position such that its longitudinal centre line is in the horizontal plane containing the centre line of said endmost ring.

3. A dispenser as claimed in either claim 1 or claim 2, wherein said column-stop member includes a forward plate-form portion having thickness substantially equal to the thickness of the ring-edge backing flanges of the applicator blade and is positioned in the channel in the vertical plane in which said backing flanges are constrained to move, thereby compensating for the offsetting of said flanges out of the plane of the grip jaws of the applicator blade and insuring movement of said grip jaws in the vertical plane of said endmost ring of the column.

4. A dispenser as claimed in claim 3,

ring of the column thereof maintained on the magazine rail in response to push force exerted thereon through the handle end of the applicator blade, withdrawal of the gripped ring is effected by reverse movement of the applicator along the channel C as results in withdrawal of said endmost ring, as is permitted by the aforementioned removal of the free ends of the cross bar of the T-shaped rail. Upon complete withdrawal of said ring having been effected, the next ring of the column thereof moves to the dispense-ready position on the rail in response to the spring loading of said column.

Various adjustments of dispenser parts and/or positioning thereof as may be necessary or considered to be advisable for the purpose of adapting the dispenser to the dispensing of various sizes of rings and to be operated by varying sizes of applicators are possible. More particularly, one or more shims 70 may be interposed between the guide plate 66 and the surface of the end upright to which said guide plate is secured, thus to vary the width of the guide channel so as to adapt it to various thicknesses of applicator. On the other hand, if the dispenser is intended only for constant applicator thickness, the entire applicator guide channel can be formed of one piece rather than being formed by plural parts as described. The magazine rail and supporting part from which it extends may be interchanged with corresponding parts but of different-size rails, etc. as may be required for the dispensing of various sizes of rings as aforesaid.

WHAT WE CLAIM IS:—

1. A dispenser for radial assembly-type retaining rings adapted to be "operated" by the same hand-manipulable applicator employed to effect their installation in shaft or spindle grooves and which applicator includes an elongate rigid strap member and an applicator blade mounted substantially flush against the relatively under face of said strap member and which terminates at its working end in arcuate grip jaws having ring-edge backing flanges disposed in slightly offset relation and in the direction of said strap-member face from the plane of the grip jaws and wherein said grip jaws when pushed against the outer edge of a retaining ring are adapted to grip said ring preliminary to withdrawing same from the dispenser and which grip-jaws terminate at a position spaced apart from the corresponding end of the strap member of the applicator, the dispenser comprising:

an elongate magazine rail for securing a supply of the rings to be dispensed in column formation thereto while permitting

feed movement of the column therealong; a support for said magazine rail;

a ring-column stop member extending transversely across one end of the rail;

spring-feed means for feeding the column of rings longitudinally along said rail in the direction of said column-stop member;

said rail being devoid of its ring-securing property for a short length portion thereof disposed immediately adjacent said column-stop member and whose length is substantially equal to the axial thickness of one ring of the column thereof;

and means providing a guide channel for an applicator as aforesaid which extends transversely through the dispenser and is disposed relatively beyond said magazine-rail end, the width of said guide channel for its length portion extending between its entrance end and said ring-column stop member being substantially equal to the combined thickness of the strap member and applicator blade, and the width of the channel throughout its remaining length portion being substantially equal to the thickness of the strap member only, the construction and arrangement being such that when the applicator turned on edge and with the applicator blade facing the ring column is inserted in and pushed rearwardly along the guide channel, the grip jaws of the applicator blade will move against and grippingly engage the endmost ring of the column thereof along a portion of its outer edge, the end portion of the strap member which extends beyond said grip jaws being meanwhile accommodated in said remaining length portion of said channel, and that responsive to subsequent withdrawal movement of the applicator from the channel the so-gripped ring is picked off from the magazine rail and withdrawn from the dispenser.

2. A dispenser as claimed in claim 1, wherein said guide channel is defined in part by an upwardly facing bottom wall adapted to support the applicator moving through the channel in position such that its longitudinal centre line is in the horizontal plane containing the centre line of said endmost ring.

3. A dispenser as claimed in either claim 1 or claim 2, wherein said column-stop member includes a forward plate-form portion having thickness substantially equal to the thickness of the ring-edge backing flanges of the applicator blade and is positioned in the channel in the vertical plane in which said backing flanges are constrained to move, thereby compensating for the offsetting of said flanges out of the plane of the grip jaws of the applicator blade and insuring movement of said grip jaws in the vertical plane of said endmost ring of the column.

4. A dispenser as claimed in claim 3,



- 5 wherein said ring-column stop member further includes a rearward portion having greater thickness than said forward plate-form portion by an amount at least as great as the thickness of a ring of the column thereof on said magazine rail, said forward and rearward portions being separated by a vertical, forwardly facing shoulder which is disposed immediately to the rear of the endmost ring of the column thereof and which serves as a back stop for said endmost ring during the course of its being gripped by the grip jaws of the applicator blade pushing thereagainst.
- 10
- 15 5. A dispenser as claimed in any one of the preceding claims, wherein means are provided for adjusting the width of the

length portion of the guide channel extending between its entrance end and said column stop member.

6. A dispenser as claimed in any one of the preceding claims, wherein means are provided for interchanging a magazine rail on said support with one of a different size.

7. A dispenser for radial assembly-type spring retaining rings, substantially as hereinbefore described with reference to the accompanying drawings.

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