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CIRCLIP DISPENSERS

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FIG.1

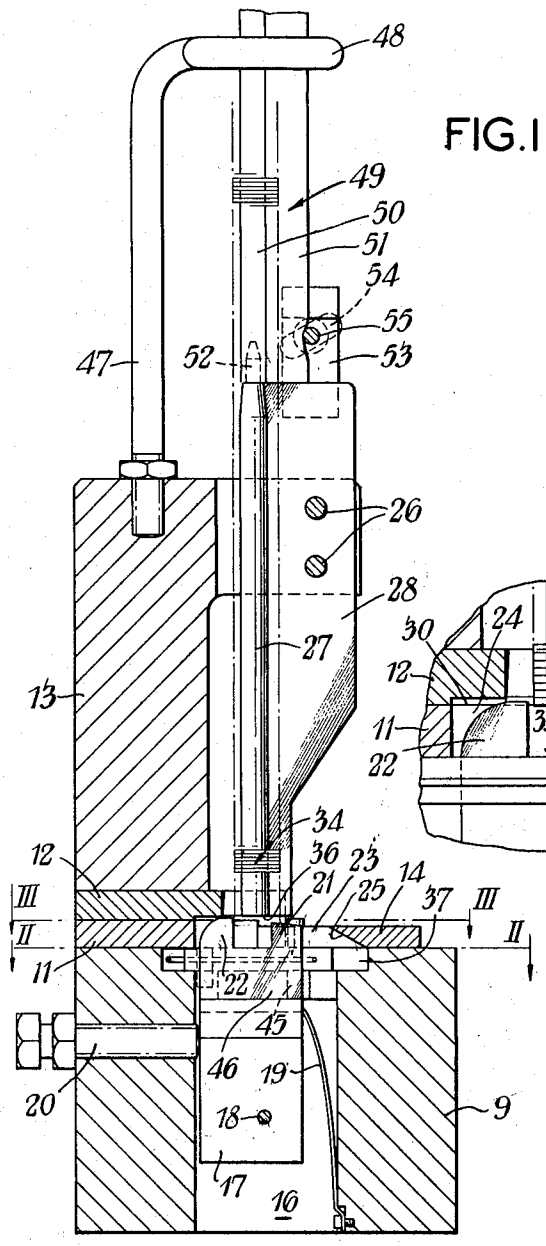
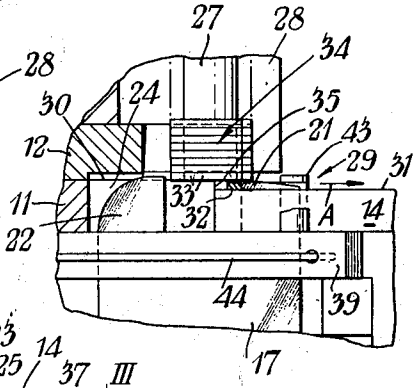


FIG.1a



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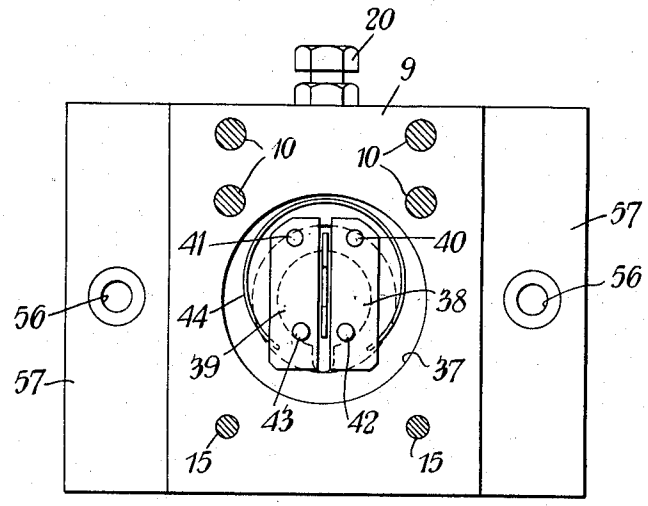


FIG.2

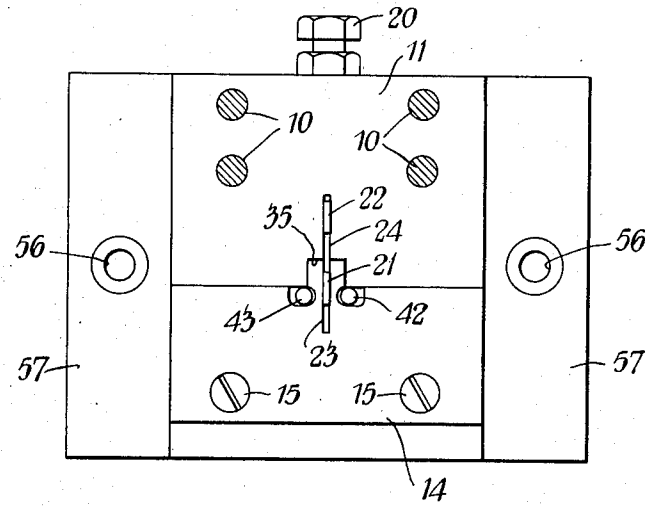
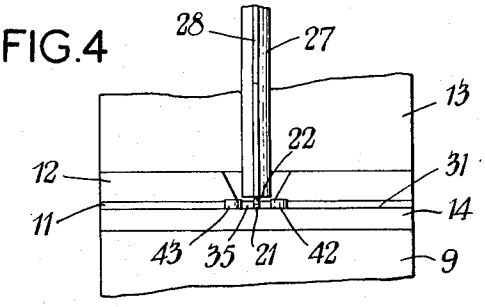


FIG.3

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FIG.4



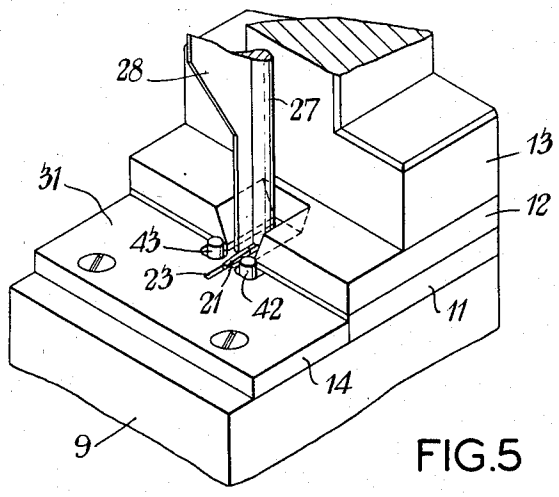


FIG.5

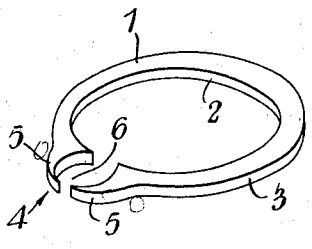


FIG.6

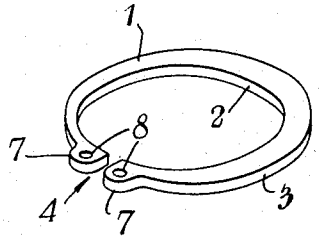


FIG.7

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3,153,493

CIRCLIP DISPENSERS

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Claims priority, application Great Britain, July 14, 1962, 22,880/62
6 Claims. (Cl. 221—23)

This invention relates to circlip dispensers which are designed for dispensing circlips of the type adapted to be positioned by axial movement of the shaft or bore which receives them and having means engageable by a hand tool for opening or closing the jaws thereof.

Circlip dispensers have previously been proposed and normally include a block from which extends a stack rod which forms a circlip magazine; where the rod meets the block being the dispensing point for the circlips. A hand tool is used for dispensing the circlips and this is in the form of a pair of spring jaws which, when presented to the lowermost circlip in the stack are sprung apart by the circlip being forced between them whereby the tool grips the lowermost circlip which then can be withdrawn by the tool. When the lowermost circlip has been withdrawn, the remaining circlips fall by gravity and a further circlip is thereby fed to the dispensing point. These prior constructions are efficient in dispensing circlips of the type which are sprung laterally into position in a groove in a shaft. The hand tool takes a dispensed circlip to the shaft and on forcing the circlip home within the groove and withdrawing the tool the circlip is located in position.

However, there are certain types of circlips both external and internal which are positioned axially of the shaft or rod or into the bore or housing. Circlips of this type are provided with two lugs which form the jaws of the circlip and in certain constructions each lug has an aperture. Small studs on a suitably constructed hand tool enter these apertures or are located between the jaws and by manipulation of the tool the jaws are moved apart so that the effective internal diameter of the circlip is increased and it can be moved into position axially of the shaft to lie within a suitably shaped groove. Previously proposed constructions of circlip dispensers are not suitable for dispensing this type of circlip because it is necessary to have the apertures in the jaws or the jaws themselves of one circlip disposed so that the studs of the hand tool can enter these apertures or be positioned between the jaws to remove the circlip from the stack.

It is the main object of this invention to provide a circlip dispenser for dispensing circlips of the specified type individually from a stack.

According to the present invention there is provided a dispenser for circlips of the type adapted to be positioned by axial movement of the shaft or bore which receives them and having means engageable by a hand tool for opening or closing the jaws thereof, including a guide along which orientated and stacked circlips are capable of being fed in succession to a dispensing point, means located adjacent the dispensing point which, as the lowermost circlip is removed, displaces the next adjacent circlip in the stack to a position previously occupied by the removed circlip, said position being laterally displaced from the stack sufficiently to expose from the stack the means engageable by a hand tool of the said next adjacent circlip.

In a further feature of the invention the means located adjacent the dispensing point may be in the form of a pivoted arm having its upper portion shaped to engage both the lowermost circlip and the next adjacent circlip in the stack so that, as the lowermost circlip is

gripped by the hand tool and removed, the arm is rotated about its pivot and moves the next adjacent circlip. As soon as the lowermost circlip has been removed from the dispenser the arm is returned, preferably by a spring, to its initial position ready for the removal of the next circlip.

In order that the invention may more readily be understood one embodiment thereof will now be described, by way of example only, and with reference to the accompanying drawings, in which:

FIG. 1 is a cross-sectional side elevation of a circlip dispenser constructed in accordance with the present invention;

FIG. 1*a* is an enlarged fragmentary view of the dispenser illustrated in FIG. 1;

FIG. 2 is a cross-sectional plan view on the line II—II of FIG. 1;

FIG. 3 is a cross-sectional plan view on the line III—III of FIG. 1;

FIG. 4 is a fragmentary front elevation of the dispenser illustrated in FIG. 1;

FIG. 5 is a perspective front view of part of the dispenser illustrated in FIG. 1; and

FIGS. 6 and 7 are perpective views of exemplified circlips of the type for which the dispenser according to the present invention has been designed.

Referring now to the drawings, a circlip dispenser in accordance with the present invention is designed for dispensing circlips individually from a stack, such circlips being of the type illustrated, by way of example, in FIGS. 6 and 7. These are two well known circlips which consist of a substantially circular part 1 having inner and outer perimeters 2 and 3 respectively and having means generally indicated at 4 for engagement by a hand tool for manipulation and positioning the circlips on the work in a well known manner. This means may be as illustrated in FIG. 6 in the form of two jaws 5 which define a mouth 6 into which may be inserted the studs of a hand tool. Alternatively, as illustrated in FIG. 7, the means consist of two jaws 7 each of which is provided with an aperture 8 which receives a stud on the hand tool. Both of the circlips illustrated in FIGS. 6 and 7 are of the external type although it should be appreciated that the invention is equally applicable to the dispensing of internal type circlips.

When circlips of the type illustrated in the FIGS. 6 and 7 are arranged in a stack, it is not possible to locate the studs of a hand tool into the mouth 6 or apertures 8 of the lowermost circlip in the stack unless that circlip has been displaced so as to expose from the stack the mouth 6 or apertures 8 and the present invention provides apparatus which achieves such displacement automatically.

Referring now to the other figures, a circlip dispenser in accordance with the invention includes a base 9 having attached to the upper surface thereof by bolts 10 a first plate 11, a second plate 12 and a pillar 13. Also fixed to the upper surface of base 9 by screws 15 is a third plate 14.

The base 9 is provided with a bore 16 within which is housed an arm 17 pivoted at 18 for limited pivotal movement. The arm is loaded by leaf spring 19 against an adjustable stop 20 and the position of arm 17 illustrated in FIG. 1 is the normal position for the arm. It is capable of being moved to the right as seen in FIG. 1 as the lowermost circlip is removed. This movement takes place against the action of spring 19 which, when the circlip has been removed, moves the arm 17 back to the position illustrated in FIG. 1.

The arm 17 is provided at its upper end with two tongues 21 and 22 and these tongues lie within elongated slots 23 and 24 in plates 14 and 11 respectively. The slot

23 in plate 14 is undercut at 25 so as to allow the tongue 21 to move forwardly and downwardly as a circlip is removed.

Fixed to pillar 13 by screws 26 is a rod 27 and a plate 28 upon which circlips are arranged in a stack. It will be appreciated that the plate 28 lies between the jaws of the circlips and thereby retains them in an orientated position from which they are fed by gravity to a dispensing point which is generally indicated at 29 in FIG. 1*a*. At the dispensing point 29, the plates 11 and 14 define upper and lower surfaces 30 and 31 respectively and, as will be seen from FIG. 1*a*, the displaced circlip 32 from the stack rests on lower surface 31 whereas the next adjacent circlip 33 in the stack rests on upper surface 30. The stack of circlips is generally indicated at 34. Between the upper and lower surfaces 30 and 31 there is a shoulder 35 the depth of which is slightly greater than the thickness of one circlip, and the distance between the upper surface 30 and the lower edge 36 of rod 27 and plate 28 is also slightly greater than the thickness of one circlip.

As will be seen clearly from FIG. 1*a*, the tongue 21 engages the inner perimeter of displaced circlip 32 whereas the tongue 22 engages the outer perimeter of the next adjacent circlip 33. The lowermost circlip 32 resting on lower surface 31 is displaced from the stack 34 sufficiently to expose from the stack the means engageable by a hand tool, this means, as previously explained, being either the mouth 6 or the apertures 8 of the circlip.

The base 9 is provided with a circular recess 37, seen more clearly in FIG. 2, within which is located two blocks 38 and 39 pivoted at 40 and 41 respectively and carrying studs 42 and 43 respectively. These blocks 38 and 39 are acted upon by spring 44 so that the studs are urged together. In the normal position of the studs 42 and 43 they will lie one on each side of the jaws 5 or 7 of the lowermost circlip.

Each of the blocks 38 and 39 has a downwardly projecting extension 45 which lies in the path of movement of a bulbous portion 46 of the arm 17, so that the studs 42 and 43 will be forced apart against the action of spring 44 when a circlip is being dispensed and the arm 17 rotated about pivot 18.

The upper end of pillar 13 is provided with a guide 47 having a loop 48 through which passes a magazine 49 charged with circlips. This magazine 49 may be in the form of a flexible synthetic plastics extrusion and consists of a rod 50 with a flange 51 which retains the circlips in orientated relation. The rod 50 is hollow and into the lower end of the rod 50 is located a spigot 52 extending from the upper end of rod 27 and the flange 51 is held in its correct position by a pair of grippers 53 which can be moved apart or closed together by operation of a wing nut 54 and screw 55. It will be appreciated that the flange 51 forms an extension of the plate 28 and thereby, when the magazine 49 is in position, the circlips on the magazine will fall on to rod 27 and plate 28 by gravity and are fed in succession to the dispensing point 29. This dispenser illustrated in the drawings is designed for attachment to a work bench or other working surface and may be bolted thereto by bolts passing through holes 56 in flanges 57 integral with base 9.

When using the dispenser described above, the magazine 49 is located in position as illustrated in FIG. 1 and circlips fall by gravity down rod 27 and are guided by plate 28 to arrive orientated at the dispensing point 29. The lowermost circlip is moved initially to the position of circlip 32 as shown in FIG. 1*a* so that the means for engagement by a hand tool is exposed from the stack of circlips 34. The next adjacent circlip 33 in the stack is no longer held in orientation by the rod 27 and plate 28 but its position relative to the stack 34 is maintained by plate 12. The dispenser is then ready for use. When it is desired to remove a circlip from the dispenser, the hand tool is used and the studs thereof are located within the mouth 6 of the circlip or within the apertures 8 thereof and the lowermost circlip 32 is withdrawn from the dispenser in the direction of arrow A in FIG. 1*a* along the lower surface 31. Because the tongue 21 of arm 17 engages the inner perimeter of circlip 32 this arm will be moved also in the direction of arrow A and because the other tongue 22 of arm 17 engages the outer perimeter of the next adjacent circlip 33 in the stack, this circlip will also be moved in the direction of arrow A along the upper surface 30. As the arm 17 pivots about pivot 18, the tongue 21 will move down below the surface 31 thereby allowing the lowermost circlip 32 to be removed from the dispenser. The tongue 22 will by then have moved the next adjacent circlip 33 so that it passes over shoulder 35 and assumes the position previously occupied by circlip 32. As soon as circlip 32 loses contact with tongue 21, the arm 17 will be returned under the influence of spring 19 to the position illustrated in FIG. 1 and the circlip 33 will be in the position previously occupied by circlip 32.

During the dispensing movement of circlip 32, the bulbous portion 46 of arm 17 will have contacted the two downwardly projecting extensions 45 on blocks 38 and 39 and will have forced studs 42 and 43 apart so as to allow the circlip 32 to pass between them. As the arm 17 moves back to the position illustrated in FIG. 1, this will enable the spring 44 to move the blocks 38 and 39 and hence the studs 42 and 43 together again and any misalignment of the circlip 33 in taking up the position previously occupied by circlip 32 will be substantially eliminated by the studs 42 and 43 contacting the outsides of the jaws of the circlip 33 and aligning this circlip. As dispensing takes place the other circlips in the stack 34 will be fed automatically to the dispensing point 29 by gravity.

Various refinements may be made to the basic design as outlined above and yet fall within the scope of the present invention as defined in the appended claims, for example, guides may be located on surface 31 for assisting in guiding the hand tool into the correct position for dispensing the lowermost circlip. Also, means other than those described above may be employed for attaching the magazine to the dispenser and if desired the circlips may be fed to the dispenser other than by gravity.

We claim:

1. A dispenser for circlips of the type adapted to be positioned by axial movement of the shaft or bore which receives them and having means engageable by a hand tool for opening or closing the jaws thereof, including a guide along which orientated and stacked circlips are capable of being fed in succession to a dispensing point, a pivoted arm located adjacent the dispensing point, said arm having an upper portion shaped to engage both the lowermost circlip and the next adjacent circlip in a stack of circlips so that, as the lowermost circlip is removed, said arm is rotated about its pivot and displaces the next adjacent circlip in such stack to a position previously occupied by the removed circlip, said circlip being laterally displaced from the stack sufficiently to expose from the stack the means on the circlip engageable by a hand tool of the said next adjacent circlip.

2. A dispenser as claimed in claim 1, in which the upper portion of the pivoted arm is in the form of two tongues, one of which engages the inner perimeter of the lowermost circlip and the other of which engages the outer perimeter of the next adjacent circlip.

3. A dispenser as claimed in claim 1, in which a shoulder at the dispensing point has upper and lower surfaces, the lower surface being that on which the lowermost circlip lies in such stack and the upper surface being that on which the next adjacent circlip lies in the stack.

4. A dispenser as claimed in claim 1, in which there is provided, on each side of the jaws of the lowermost circlip, an upstanding spring urged stud urged towards the other stud, said studs being urged apart by

removal of the lowermost circlip from such stack and returning to their normal positions under spring pressure when the lowermost circlip has been removed from such stack to align the next adjacent circlip into substantially the exact position previously occupied by the removed circlip.

5. A dispenser as claimed in claim 4, in which each stud is mounted on a pivoted block and in which pivotal movement of the arm, by withdrawal of the lowermost circlip, causes the studs to be moved apart.

6. A dispenser as claimed in claim 1, in which the guide

is disposed above the dispensing point for gravity feed of the circlips thereto, the upper end of the guide having means for the attachement of a magazine charged with circlips.

References Cited in the file of this patent

UNITED STATES PATENTS

2,635,026	Kreul	Apr. 14, 1953
3,029,978	Gummere et al.	Apr. 17, 1962
3,092,287	Erdmann	June 4, 1963