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2,364,530

DEVICE FOR FILLING AND EMPTYING CARTRIDGE BELTS

Filed March 18, 1938

2 Sheets-Sheet 1

Fig. 1.

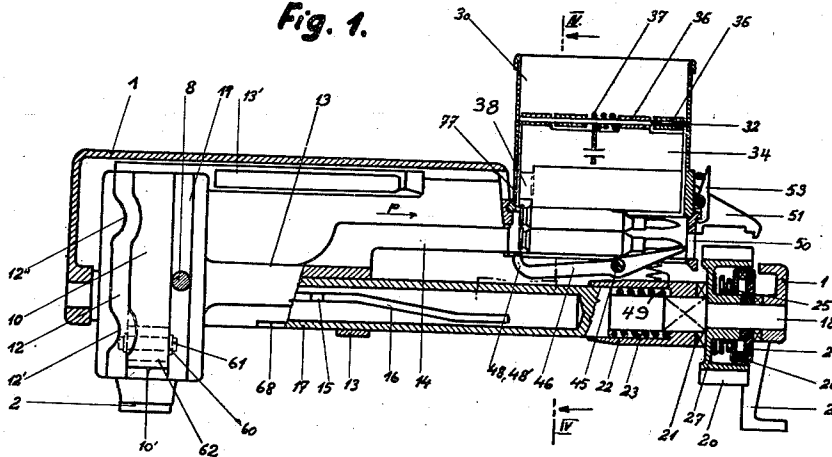


Fig. 2.

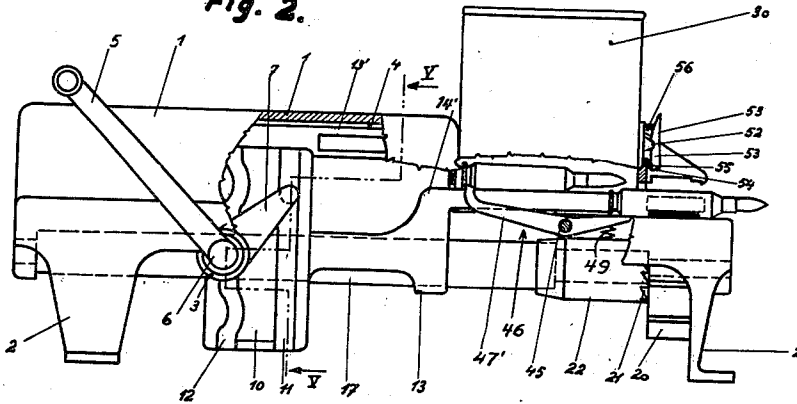
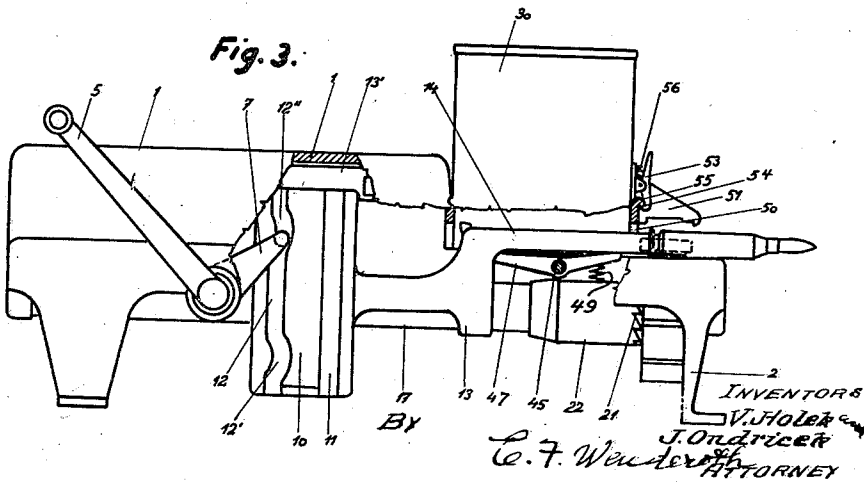


Fig. 3.



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2 Sheets-Sheet 2

Fig. 4.

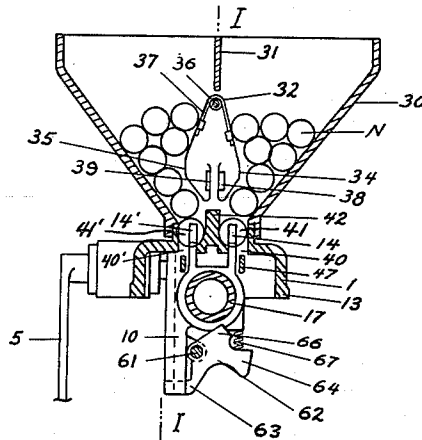


Fig. 5.

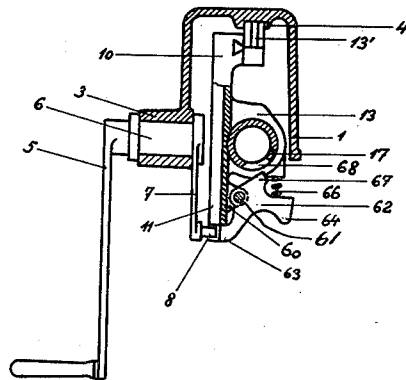


Fig. 6.

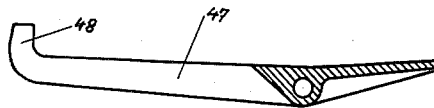
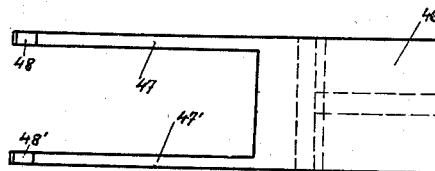


Fig. 7.



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DEVICE FOR FILLING AND EMPTYING
CARTRIDGE BELTS

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2 Claims. (Cl. 86—48)

This invention relates to a device for filling and emptying cartridge belts, the device being provided with a displaceable ejector for the cartridges and with a drum for feeding the belt thereto, which drum is controlled by a shaft movable by a displaceable part of the driving mechanism.

The invention has for its chief object to provide a device which will ensure a rapid filling of the belts with the cartridges without hindrances which arise especially owing to the incorrect position of the cartridges in the cartridge container.

According to the present invention the filling device is provided with means for holding the cartridges in a cartridge container and means for feeding the cartridges to the belt from the bottom of the container.

The container is formed at its bottom with a charging space from which the cartridge is pushed into the belt and subsequently a second cartridge is allowed to fall into the charging space. A further feature of our invention is the provision of a shaking means in the container, the movements of which are controlled by the cartridge pushing means as will be more clearly explained hereafter.

The filling device according to the invention can be used both for filling and for emptying the cartridge belt; this is effected by altering the path of the cartridge ejector. This alteration of the path is obtained by means of a simple device which is based on the fact that the slide, on which the cartridge ejector is arranged, is provided with two grooves with which the pin of the crank-drive mechanism engages as required.

The filling device according to the invention is of simpler construction than previous devices of this kind, cheap to produce, readily operated, light in weight and suitable for transport.

In order that the said invention may be clearly understood and readily carried into effect, the same will now be described more fully, by way of example, with reference to the accompanying drawings in which:

Fig. 1 is a longitudinal sectional view with parts in elevation and of the cartridge filling apparatus.

Fig. 2 is a longitudinal elevational view with portions in section illustrating the position taken by certain elements during the feeding of the cartridge into the belt.

Fig. 3 shows a similar view with the apparatus adjusted for ejecting cartridges from the belt.

Fig. 4 is a cross sectional view taken on the section line IV—IV of Fig. 1.

Fig. 5 is a cross sectional view taken on the line V—V of Fig. 2 illustrating the position in which the recess 68 in the shaft 17 is located opposite the lever arm 67 so as to permit adjustment from a charging to an ejecting position or vice versa.

Fig. 6 shows a sectional elevation of the holding member for the cartridges, and

Fig. 7 is a plan view of the holding member shown in Fig. 6.

Referring to the drawings, 1 denotes a box-like base body having feet 2. The drive of the mechanism consists of a crank 5 (Figure 5) which is keyed on a pin or shaft 6 that is mounted in a bearing 3 in the wall of the box 1. Secured to the inner end of the shaft 6 is a crank 7 which is provided with a pin 8 which engages in a groove 11 or 12 (Figures 2 and 3) in a slide 10 that is displaceably arranged on a holder shaft 17 which is rotably mounted in bearings in the side walls of the box. For this purpose, the slide 10 is provided with a tubular attachment 13 which is mounted on the hollow shaft 17 that is provided with a helical groove 16 in which a pin 15 on the attachment piece 13 on the slide engages, so that, during the displacement of the slide, the shaft is rotated. Since the crank mechanism is symmetrically arranged, the operation of the device is not altered whether the crank handle 5 is rotated in one direction or the other.

On an offset end 18 of the shaft 17 there is loosely mounted a drum 20 for feeding the cartridge belt (not shown) to the device, which drum is provided on the periphery thereof with teeth that engage in the individual members of the belt. When the slide is moved by the crank 5 the shaft 17 is rotated by engagement of a lug 15 with the walls of a cam slot 16 in the shaft 17.

The said drum is provided on one end face with teeth 21 which engage with teeth formed on a tube 22 (Figures 1 and 2) which is mounted on the shaft 17 and is urged by a spring 23 toward the right as viewed in Fig. 1. The teeth are formed in such a manner that they engage when the shaft is rotated in one direction whilst they slip over each other when the shaft is rotated in the opposite direction. In order to prevent the drum from turning back, a disc 25 (Figure 1) is mounted on the hub of the drum so as to be displaceable by means of a spring 27 acting thereon. The disc 25 is provided with teeth 26 reversely formed stationary teeth secured by and projecting inwardly from the right hand bearing of the shaft 17. These latter teeth are so formed that when the teeth on the tube 22

slide over the teeth 21 the drum 20 is held from rotation by the stationary teeth of the bearing.

A cartridge container 30 is removably connected to the box 1 by means of a lever 53 (Figures 1 and 2) which is rotatably mounted on a pin 52 and a projection 54 which engages with fixed teeth 55 on the box 1. Connected to the cartridge container 30 is an attachment 51 which prevents the cartridge belt from slipping out of the teeth of the feeding drum 20. The cartridge container 30 is divided by a vertical wall 31 into two chambers from which the cartridges are passed into two charging spaces 40 and 40' which are formed as channels at opposite sides of a rib 42 on the top wall of the box 1. The charging spaces are provided with longitudinal openings 41 and 41' through which ejectors 14 and 14' for the cartridges pass. These ejectors form a bifurcation on the tubular attachment 13 on the slide 10.

Below the dividing wall 31 of the cartridge container is located the shaking device which ensures the continuous feeding of the cartridges into the charging spaces. The shaking device consists of two plates 34 and 35 which are bent into a ridge-like shape and the bottom parts of which are turned towards each other. The parts 34 and 35 of the shaking device are provided with hangers by means of which they are mounted on a pin 32 which is mounted in eyes formed on the bottom edge of the dividing wall 31. Arranged concentrically with the pin 32 is a spring 37 one end of which is attached to the part 34 and the other end of which is attached to the part 35 of the shaking device, the said spring maintaining the parts in the facing position, so that these parts form a hollow prism that is suspended on the pin 32 by means of one edge. On the side facing the slide, the two parts 34 and 35 are provided with bevelled stop pieces 38 and 39, respectively, between which is passed a flat wedge spike 13' of rectangular cross-section (Figures 1 and 5) which is rigidly fixed in dovetail manner to the slide 10, so that it carries out the pushing movement. The spike 13' is guided in a guide 4 which is formed in the top wall of the box 1 and which also serves as a guide for the slide 10. Suitable openings are formed in the cartridge container for the passage of the spike through the wall of the box and the cartridge container.

Beneath the cartridge container 30 there is arranged a cartridge holder which consists of a lever 46 of the first order rotatably mounted on a pin 45 that passes through the walls of the box. One arm of the cartridge holder passes into an opening 50 in the box, through which opening the cartridges are pushed out of the charging space into the cartridge belt, whilst the other arm is forked, the forked parts 47 and 47' (Figures 5 and 6) being bent to form projections 43 and 48' which, when the lever is turned, passes into the charging spaces 40 and 40' (Figure 4). The lever 46 is loaded by a spring 49 which is mounted in the depression that is formed in the box beneath the wall 42 that separates the charging spaces.

The slide 10 (Figure 1) is provided with a device which permits the pin 8 of the crank mechanism to be shifted from the groove 11 to the groove 12 when the filling device is to be employed for pushing the cartridges out of the belt. One constructional form of this device is illustrated in Figure 5 and consists of a three-armed lever 62 which is rotatably mounted on a pin 61 fixed in eyes 60 formed in the slide. One

arm 63 of the lever is provided with a tooth that engages with an opening 10' in the slide (Figure 1), and a second arm 64, which serves for operating the lever and is urged downwardly by a spring 66, whilst a third arm 67 is formed with a projection which engages, only in a definite position, in an opening 68 formed in the shaft 17.

Before the filling of the cartridge belt is commenced, the slide 10 is adjusted so that the pin 8 on the crank 7 engages in the straight groove 11 (Figures 1 and 2). The displacement of the slide 10 on the shaft 17 is effected by rotating the crank handle 5, during which displacement the ejectors 14 and 14' push the cartridges out of the cartridge spaces 40 and 40'. The pushed out cartridges slide on the shorter arm of the holder 46 for the cartridges and causes the rocking of this lever, so that the forked parts 47 and 47' of the arm pass, by means of their projections 43 and 48', into the charging spaces and hold the bottom cartridges fast, so that the latter do not fall into the charging space and thus do not cause any possible disturbance. After the cartridges are pushed out, the slide returns with the ejector. During this movement, the teeth 21 on the tube 22, which are pressed towards the right by the spring 23, come into engagement with the engaging surfaces of the teeth arranged on the feeding drum, and the cartridge belt is displaced through two divisions and is thus prepared for further filling.

During the working movement of the ejectors (in the direction of the arrow p), the teeth 21 slip over each other and the teeth 26 on the disc, and the drum 20 is held against rotation by engagement of the bearing teeth with the teeth on the disc 25.

In the working movement of the ejectors (in the direction of the arrow p), the shaking device also comes into operation, since the wedge spike 13', which moves with the slide, passes through the openings in the box and the cartridge container 30 and strikes the bevelled stop pieces 38 and 39 of the parts 34 and 35 and moves them against the action of the spring 37. On the return movement, the spring 37 brings the parts 34 and 35 back into their original position as soon as the spike 13' comes out of engagement with them, and this operation, which is repeated on every working stroke, causes the shaking and the arranging together of the cartridges, so that the latter can be fed continually into the charging space without any jamming of the cartridges.

During the return movement of the ejectors 14 and 14', the shorter arm of the cartridge holder 46 is kept in the position represented in Figure 2. It is only when the ejectors leave the shorter arm e. i. the arm at the right of the pivot 45 as shown in Fig. 2 of the holder that the lever 46 is turned, under the action of the spring 49, into the position shown in Figure 1, in which position the shorter arm engages in the opening 50, so that it prevents the cartridges from falling out accidentally, and the forked arms 47 and 47' moves with its projections 43 and 48', out of the openings 41 and 41', so that it frees the way for the lowest cartridges to lie in the charging spaces and to be prepared for being pushed out.

The filling device according to the present invention is arranged in such a manner that the filled belts can also be emptied thereby. The pushing of the cartridges out of the cartridge belt, which is also mounted on the feeding drum, is effected by the path of the ejectors 14 and 14'

being prolonged by as much as is necessary for pushing the cartridges out.

For this purpose, the slide 10 is secured firmly in the position in which the projection 67 is adjusted opposite the opening 68 (in the construction shown in Figure 5). In this position, it is possible to press the arm 64, which pressure results in the projection on the arm 63 coming out of engagement with the opening 10' in the slide 10. The pin 8 of the crank is then brought over into the groove 12 in the slide, with the result that the path of the ejectors 14 and 14' is prolonged in the direction of the arrow *p* to such an extent that the pushing of the cartridges out of the belt is rendered possible. Upon the release of the arm 64, the corresponding arm of the securing lever drops into the opening in the slide and the filling device is prepared for the pushing out. The groove 12 is curved in a part 12' thereof, as can be seen from Figures 1 and 2. The object of the curved part 12' is to obtain a greater force on the pushing of the cartridge out of the belt, since, as is known, the cartridge is held in the known manner by means of a groove or by means of the edge of the cartridge by a projection formed in the cartridge belt.

The groove 12 may be provided with two curved parts 12' and 12'' in order to enable the cartridge to be pushed easily out of the belt in the rotation of the crank to one side or the other.

It will be understood that the filling device described and illustrated is given only as an example of an embodiment of the invention and that the individual details thereof may be varied without altering the scope of the invention.

What we claim is:

1. A filling device for cartridge belts, comprising a container for the cartridges, a shaking de-

vice associated with said container consisting of a hollow ridge-like body divided into two parts movable relatively to each other, a slide and mechanism for operating said slide, a device connected with said slide, means on said parts of said hollow ridge-like body, said device on said slide co-operating with said means, a member carried by said slide constituting an ejector for the cartridges from said container, said slide including grooves co-operating with said member, one of said grooves serving to control the movement of said ejector for pushing the cartridges into the cartridge belt and the other of said grooves serving to push the cartridges out of the belt, a drum for feeding the cartridge belt, a shaft for said drum, a part displaceable with said slide for operating said shaft, and a device for holding the cartridges located in said container above the ejected cartridges, said device being controlled by means of the cartridges ejected from a charging space at the bottom of the container.

2. A filling apparatus for a cartridge belt comprising a container for the cartridges, a drum for feeding the cartridge belt, a shaft for said drum, driving means for operating said shaft, a slide for ejecting cartridges from said container, said slide having two spaced grooves therein, crank means adapted to cooperate with either one of said grooves, a pivoted multi-armed setting lever mounted on said slide and cooperating therewith, said slide having a recess cooperating with said setting lever whereby said slide may be adjusted so that said crank means may engage in either one of said grooves.

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