SPECIFICATION

Cartridge feed device for an automatic firearm

The invention relates to a cartridge feed device for an automatic firearm having two oppositely disposed ammunition feed systems for the selective feeding of two ammunition belts to an ammunition feed point.

In the case of a known cartridge feed device of this type, disclosed in German published application No. 1 578 427 a slider is provided for advancing the ammunition belts, which slider engages a groove in a spring cage which is connected to the breech head. During the return movement of the breech head with the spring cage, the slider is displaced perpendicularly to the weapon axis. So that the slider is constantly in engagement with the groove, the spring cage must be at least as long as the breech head travel. Such a long spring cage, being connected to the mushroom head and thus participating in the entire travel of the mushroom head, requires a correspondingly long breech casing.

A further disadvantage of this known cartridge feed device resides in the fact that the slider with the advancing pwals for the cartridge is located between the spring cage and the cartridge belt, so that the cartridge belt cannot be fed directly alongside the axis of the weapon barrel and a pronounced deflection of the cartridge which is to be pushed into the weapon barrel through the breech is necessary.

It is true that a belt shifting device is already known (see German Patent Specification No. 1 578 400), which is so constructed that a long breech casing is avoided, but in which advance of the cartridge belts occurs via shifter wheels and not by means of advancing pawls.

Furthermore, a cartridge feed device is already known (see U.S. Patent specification No. 3 447 418) in which the two cartridge belts are fed relatively closely to the axis of the weapon barrel, so avoiding a pronounced deflection of the cartridges which are to be pushed through the breech into the weapon barrel. However, the drive for the advance of the cartridge belts is not provided by the returning breech head but by the recoil of the entire firearm.

The problem which the present invention sets out to resolve resides in the provision of a cartridge feed device in which, on the one hand, the spring cage can be shorter than the travel of the breech head and correspondingly, too, the breech casing is shorter in construction and, on the other hand, the cartridge belts are located as closely as possible along-side the weapon axis in order to avoid a marked deflection of the cartridges.

The invention provides a cartridge feed device for an automatic firearm, comprising two oppositely disposed ammunition feed systems for the selective feeding of two different ammunition belts to an ammunition feed point, an advancing means driven by the breech of the weapon and having on one side of a spring cage connected to the breech a groove inclined towards the axis of the weapon, and a slider for each ammunition belt, the sliders being operatively connected to advancing pawls for moving the two ammunition belts, one slider being actuable by engagement in this groove, wherein the advancing device has a further slider which can be actuated by engagement in the groove, and the two sliders which engage the groove are so located that upon return movement of the spring cage, the first one slider and then the other slider will engage the groove, and a first transmission means transfers the movement of one slider to the other slider while a second transmission means transfers the movement of the second slider to the third slider, there being only a single transmission means between the two ammunition belts.

The advantages of the cartridge feed system according to the invention reside essentially in that the spring cage comprising a groove is substantially shorter and lighter in weight than the known spring cages so that the conveyor sliders which are provided with advancing pawls are not disposed between the two cartridge belts but outside of the belts, so that the advancing pawls push the cartridges towards the barrel and not away from it, and deflection of the cartridges when they are pushed into the barrel is thus facilitated.

One embodiment of the cartridge feed device according to the invention is described in detail hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a view from above of the breech casing with the two ammunition guides;

Figure 2 is a diagrammitic view of a part of the breech casing, in section;

Figure 3 is a diagrammatic view of the advancing means located in the breech casing;

Figure 4 diagrammatic view of the entire breech casing;

Figure 5 is a diagrammatic view of the advancing means located in the ammunition guide; and

Figure 6 is a diagrammatic view of the ammunition guide.

Referring to Figure 1, a weapon barrel 11 is fixed to a breech casing 10, on both sides of which two ammunition guides 12 and 13 are disposed to pivot about axes 14 and 15. The axes or journals 14 and 15 are fixed on a stationary cradle of the weapon, the cradle not being shown in the drawings. The breech casing is however displaceably located on this cradle so that the fixed journals 14 and 15 protrude through elongated holes 14*a* and 15*a* in the breech casing, as can be seen in Figure 4.

Located in cylinders 65 (see Figure 4) and not visible in the drawing are recoil springs which have their rear end biassed on the journals 14 and 15. The movement of the breech casing 10 is limited by the length of the elongated holes 14*a* and 15*a*.

The first ammunition guide 12 is shown in Figure 1 in its swung out position, which means no cartridges 66 can be fed to the weapon from this ammunition guide 12. The second ammunition guide 13 is shown in its swung-in position in Figure 1, which means that cartridges 67 can be fed to the weapon from this ammunition guide 13. The cartridges 66 and 67 pass in two parallel rows on either side of the breech casing 10 to in each case an ammunition feed point

or entrance aperture 68 into the breech casing (see Figure 4). Indicated in Figure 6 above the first ammunition guide 12 is a flexible duct 69 through which the cartridge belts 66 enter the first ammunition guide 12 and from there to the entrance aperture 68.

The pivoting range of the two ammunition guides 12 and 13 is, as shown in Figure 1, limited by abutments 16 and 17.

As shown in Figure 2, there is behind the weapon barrel 11 a breech head 18 comprising two breech bolts 19 located one on either side of the breech head 18 and of which only one is visible in Figure 2. A control member 20 displaceable in the breech head 18, in the forward position indicated in the drawing, presses the breech bolt 19 into recesses 21 so that the breech head 18 is locked in its farthest forward position. The recess 21 is disposed in a sleeve 22 fixed on the barrel 11 of the weapon. Fixed on the control member 20 is a percussion needle 23 which protrudes through the breech head 18 and serves to strike a cartridge which is located in a chamber 24 at the rear end of the barrel 11. The control member 20 has a recess 25 into which the nose of a spring cage 27 protrudes. In the interior of the spring cage 27 is a guide rod 34 around which a breech spring 28 is coiled, the aim of the spring 28 being to push the spring cage 27 and, by means of the projection 26, the control member 20 as well as the breech head 18 into the farthest forward position in which the chamber 24 of the barrel 11 is closed. Protruding into a recess 29 in the spring cage 27 is a entraining member 30 mounted on an endless chain 31. This endless chain 31 is guided parallel with the weapon axis via two sprockets 32 of which only the forward sprocket can be seen in Figure 2. A crank handle 33 shown in Figure 4 and engaging the second sprocket 32, not visible in the drawings, serves for cocking the breech spring 28 and for retracting the breech head 18 out of its farthest forward position, shown in Figure 2, into its farthest back position, not shown in the drawings.

A screw 35, which is rotatably but axially immovably mounted at one end in the breech casing 10 and which, at the other end, is screwed into a sliding member 36 carrying the sprocket 32, serves for tensioning the endless chain 31.

The axis of the barrel 11 of the weapon and the axis of the guide rod 34 around which the breech spring 28 is coiled, and the endless chain 31 are in a vertical plane of symmetry of the weapon. As mentioned, the recoil spring not shown is disposed in the cylinder 65 shown in section in Figure 2. Also indicated in Figure 2 is a gas draw-off passage 70 which leads to a cylinder 71 in which there is a gas piston 72 (see Figure 3).

According to Figure 3, the spring cage 27 has, inclined towards the weapon axis, a groove 37 into which protrudes on the one hand a dog 38 on a first slider 39, so long as the spring cage 27 is in the forward part of its path of movement, and on the other hand a dog 40 of a second slider 41 as soon as the spring cage 27 is in the rear part of its path of movement. Each of these sliders 39 and 41 has a rack 42 or 43 which together mesh with a bar-like gearwheel 44. Instead of the bar-like gearwheel 44, it is possible to provide a shaft having at each end a gearwheel and respectively, these latter meshing with the racks 42 and 43 on the two sliders 39 and 41. The gearwheel or the gearwheel at the end of the said shaft meshes in turn with a further gearwheel 45. A third slider 46 engages this further gearwheel 45 through a rack. The second and third sliders 41 and 46 each have a flange 47 and 48 respectively.

As shown in Figure 4, the three sliders 39, 41 and 46 are guided in the breech casing 10 in recesses 39*a*, 41*a* and 46*a*. Between the two sliders 39 and 41, the breech casing 10 is relatively narrow so that the cartridges 66 and 67 fed to both sides of the breech casing 10 can be disposed closely alongside each other and close to the weapon axis. The gap between the two cartridge belts 66 and 67 can be seen particularly in Figure 1.

As may be seen in Figure 5, a sliding member 49 comprises a groove 49*a* into which protrudes the flange 47 of the second slider. This sliding member 49 is articulated on one arm 50 of a two-armed lever 51. The two-armed lever 51 has a sleeve 51*a* on which are fixed the two arms 50 and 53 of the lever 51. The lever 51 is mounted in the ammunition guide 12 (Figure 1) so that it can pivot about its axis 52. A two-armed lever constructed as a mirror opposite thereof is pivotally mounted in the other ammunition guide, and since this lever does not otherwise differ from the lever 51, it is not shown here in greater detail. Articulated on the second arm 53 is a further sliding member 54 which is guided in a groove 56 in a conveyor slider 55. This conveyor slider 55 is, as Figure 6 shows, displaceably located in the ammunition guide 12. A similar conveyor slider, not shown, is displaceably disposed in the other ammunition guide 13. Both conveyor sliders have in each case two advancing pawls 57 (Figure 5) which are braced on a cartridge 58. A spring not shown seeks to press the two advancing pawls 57 against the cartridge 58. The conveyor slider 55 is, in Figure 5, in its lowest position and the cartridge 58 is in its pushing-in position 68 in respect of the breech casing 10, the position in which it can be pushed into the chamber 24 of the barrel 11 by the breech head 18 (Figure 2). By means of the two-armed lever 51, the conveyor slider 55 can be lifted sufficiently for the two advance pawls 57 to be braced against the next cartridge 59. A pawl 60 pivotally mounted in the ammunition guide 12 has the task of preventing the cartridge belt with cartridges 58 and 59 moving back when the conveyor slider 55 with the advancing pawls 57 is lifted in order to grip the cartridge 59. A spring not shown seeks to press the pawl 60 against the cartridge 58.

The cartridge 58 is supported on two rails 61 on which the cartridge 58 is guided through the entrance aperture 68 towards the weapon axis. The rails 61 also serve to strip the belt element 62 off the cartridge 58. The preceding belt element 63 has been stripped from the preceding cartridge, not shown in the drawing, which has already been inserted into the chamber 24 of the barrel of the weapon. The belt element 62 has two lugs 64 by which it is supported on the rails 61 so that when the cartridge 58 is

displaced into the chamber 24 of the weapon barrel 11 by the forwardly moving breech head 18, the belt element 62 is stripped from the cartridge 58.

The device for pivoting the two ammunition guides 12 and 13 into their operative or inoperative position, as the case may be, is assumed to be already known and since it is not part of the object of the invention, it is not described in greater detail here.

As already mentioned, the two ammunition guides 12 and 13 are mounted to rotate about the fixed axes of journals 14 and 15 of the cradle, while the breech casing is located so that it can move back on the cradle, being supported on journals 14 and 15 via recoil springs. As a result of this arrangement, the second and third sliders 41 and 46 (Figure 3) which are disposed in the breech casing 10 are able to move in relation to the two-armed levers 51 which are mounted in the two ammunition guides 12 and 13 and it is therefore essential that the flanges 47 and 48 of the two sliders 41 and 46 which are guided in the grooves 49*a* in the sliding members 49, should be sufficiently long that they do not slip out of the grooves 49*a*.

CLAIMS

1. A cartridge feed device for an automatic firearm, comprising two oppositely disposed ammunition feed systems for the selective feeding of two different ammunition belts to an ammunition feed point, an advancing means driven by the breech of the weapon and having on one side of a spring cage connected to the breech, a groove inclined towards the axis of the weapon, and a slider for each ammunition belt, the sliders being operatively connected to advancing pawls for moving the two ammunition belts, one slider being actuable by engagement in this groove, wherein the advancing device has a further slider which can be actuated by engagement in the groove, and the two sliders which engage the groove are so located that upon return movement of the spring cage, first one slider and then the other slider will engage the groove, and a first transmission means transfers the movement of one slider to the other slider while a second transmission means transfers the movement of a second slider to the third slider there being only a single transmission means between the two ammunition belts.

2. A device according to Claim 1, wherein the first transmission means comprises two gearwheels rigidly connected to each other, one gearwheel engaging a rack of the first slider and the second gearwheel engaging a rack of the second slider.

3. A device according to Claim 2, wherein the second transmission means consists of a third gearwheel meshing with the second gearwheel and with a rack on the third slider.

4. A device according to Claim 3, wherein the three sliders are displaceable guided in three different but mutually parallel grooves in the breech casing, and the three gearwheels are rotatably mounted in the breech casing, their axes being parallel with the axis of the weapon.

5. A device according to Claim 1, wherein the second and third sliders are each operatively connected by a two-armed lever pivotally mounted in the ammunition guide to a respective conveyor slider having advancing pawls and displaceable perpendicularly to the weapon axis in a groove in the ammunition guide.

6. A device according to Claim 5, wherein one arm of the lever is pivotally connected to a sliding member having a groove into which penetrates a flange of the second or third slider and in that the other arm of the lever is pivotally connected to a sliding member which penetrates into a groove in the conveyor slider and the two arms of the lever are fixed on a sleeve which is pivotally mounted in the ammunition guide.

7. A device according to Claim 1, wherein the two ammunition belts are disposed parallel with each other, the second and third sliders are located on the breech casing disposed between the two cartridge belts, and the two conveyor sliders are located on the sides of the ammunition belts which are opposite the breech casing so that the distance betweeen the two cartridge belts is relatively small.

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