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(54) **Drum magazine for a gun.**

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Description

This invention relates to a drum magazine for a gun.

Known drum magazines tend to suffer from friction losses caused by friction between the cartridges in the magazine and the internal surfaces of the magazine. Although it might be expected that there would be rolling friction with the cartridges, in fact, there is no rolling friction, but simply sliding friction.

One known drum magazine is the Thompson which is capable of holding up to fifty rounds and is described in "The World's Sub-machine Guns (Machine Pistols)", Volume 1 by Thomas B. Nelson, International Small Arms Publishers, Cologne, West Germany, first edition, second printing June 1964, pages 51 to 53. In the Thompson magazine there is a spiral guide in which the cartridges are arranged in, effectively, rows and the cartridges are swept out of a feed throat by six radial, rotating, arms driven by a spring which sweep all of the cartridges simultaneously around the rows. The friction in such a magazine is very great and it has been found that it is not practical to provide more than two spiral rows. However, it is possible to increase the capacity of such a magazine by increasing the drum diameter without increasing the number of rows, but the magazine then becomes undesirably bulky.

In an attempt to reduce the friction losses, a further known magazine is the Soumi drum magazine, described in the forementioned book at pages 562—565 and G.B. Patent No. 472,784 and shown in Figures 1 and 2 of the accompanying drawings. In the Soumi magazine, a circular, pan-like housing 1' is provided having a rotatable base plate 2' upon which the cartridges sit in paths 3', 4' defined by concentric guides 5', 6' and the inner surface of the housing 1' respectively and a bridge 7' linking the paths 3', 4'; the guides 5', 6' and bridge 7' being rotatable with the base plate 2'. The housing has a throat 8', a feed ramp 9' and a stop 10' with which a lug 11' mounted on the guide 5' co-operates. A coil spring (not shown) beneath a rotor 12' drives the rotor and an associated pivotal pusher 13'. The cartridges are referenced 15' and the cartridge adjacent the lug 11' is referenced 16'.

In operation, the spring drives the rotor 12' and pusher 13' which applies pressure in the direction of arrow-headed line A, through all of the cartridges up to the lug 11' so that it is the pressure on cartridge 16' which drives the guides 5', 6' and the base plate 2'. The pressure on lug 11' thus urges the cartridges up the ramp 9' and through the feed throat 8'. There is, thus, frictional resistance between the cartridges in the outer row pushing outwardly against guide 1', although the inner row of cartridges is rotatably carried by the base plate 2' for the first partial revolution until the cartridges in the outer row are ejected through the throat 8' and this frictional resistance is less than that associated with the Thompson magazine. The friction is less than with the Thompson magazine because the guides 5', 6' that form the inside and outside diameter of the innermost row of ammunition moves with the ammunition for the first revolution. During that revolution, the outer row is driven out of the feed throat, but its inside diameter guide moves with it so that the outer row has only one half the sliding friction contact of the Thompson type and the inner row has non at all. When, however, the lug 11' engages the stop 10', the bridge 7' from the inner path 3' to the outer path 4' is in alignment with the feed throat 8' and the base plate 2' no longer rotates so that the inner row of cartridges abrade against the stationary guide surfaces, thereby producing a high friction force which is similar to that of the Thompson magazine. Additionally, because the pusher 13' exerts pressure on the last cartridge 15' in the magazine to drive all the other cartridges and because the cartridges are circularly arranged, the cartridges are forced outwardly against the guide surfaces, thereby increasing friction. It has, again, been found impractical to increase the number of paths to improve the capacity of such a magazine and if increased capacity is sought it is, once again, necessary to increase the drum diameter undesirably.

A further disadvantage of the forementioned drum magazine is that they can only readily be filled with cartridges by removing the circular planar cover, since they can only be filled through the feed throat by sliding cartridges between the feed lips in the axial direction of the housing.

The present invention seeks to provide a drum magazine of compact dimensions and of relatively large capacity which exhibits less friction to cartridge movement than the drum magazines described above and in which cartridges may be inserted into the magazine through the feed throat in a direction perpendicular to the housing axis.

According to this invention there is provided a drum magazine for a gun including a stationary housing, an inner rotatably mounted member and an outer rotatably mounted member substantially concentric therewith, drive means for rotating the members in a first direction, stop means for limiting rotation of the outer member with respect to the housing characterised by latch means between the outer member and the housing arranged to lock when the stop means limit the rotation of the outer member to thereby prevent rotation of the outer member in a counter direction to the first direction until the inner member is rotated in said counter direction a predetermined amount.

Preferably said members each comprise a substantially concentric sprocket means, each said sprocket means including a tubular member and having an outer periphery provided with a plurality of serrations arranged to nest a plurality of cartridges.

Advantageously more than two sprocket means are provided, and the stop means comprise abuttable stop members provided between the hous-

ing and the outermost sprocket means and between adjacent sprocket means except between the innermost sprocket means and the sprocket means adjacent thereto. In such an embodiment further latch means are provided between adjacent sprocket means except between the innermost sprocket means and the sprocket means adjacent thereto, each said latch means being engageable when the cooperating stop members about each other such that each said latch means prevent rotation of an associated latched sprocket means until the serrations thereof are required to be filled with cartridges.

Conveniently the latch means between the housing and the outermost sprocket means comprise a strip member pivotally connected to the outermost sprocket means and spring biassed toward the inner peripheral wall of the housing, and a recess or aperture in said peripheral wall, the strip member having an ear for engaging with the lip of the recess or aperture when the stop members associated with the housing and the outermost sprocket means abut. Also conveniently the further latch means between adjacent sprocket means comprise a strip member pivotally connected to the inner of the two adjacent sprocket means which is spring biassed toward the inner wall of the tubular member of the adjacent outer sprocket means and a recess or aperture in said inner wall, the strip member of the further latch means having an ear for engaging with a lip of the recess or aperture in said inner wall when the stop members associated with the adjacent sprocket means abut. Advantageously said strip member has a tang on the opposite side of the associated pivot from the ear which tang passes through the tubular member of the sprocket means to which it is attached and toward the adjacent inner sprocket means, whereby the tang is arranged to have a length sufficient to be contacted by a cartridge on said adjacent inner sprocket means for the strip member to be rotated thereby such that the ear of the strip member disengages its associated lip and permits the sprocket means to which the strip member is attached to rotate. Because cartridges in the ramps are pushed outwardly by the force of the drive means, preferably the strip member is located in the wall of the tubular member of the sprocket means to which the strip member is attached and arranged to be depressed therein by cartridges on said sprocket means.

In a preferred embodiment the sprocket means each comprise the tubular member with at least two circular, radially extending flanges spaced therealong, each flange having serrations arranged to nest a plurality of cartridges therebetween, the serrations of the innermost sprocket means being spaced from the inner surface of the next adjacent outer sprocket means by substantially the same distance as the serrations of the outermost sprocket means are from the housing interior peripheral wall, a cartridge feed aperture in each tubular member except the innermost for permitting cartridges to pass through the apertured tubular members and feed ramps arranged to guide cartridges from each of the sprocket means to a feed throat of the housing. Advantageously the strip member has a finger adjacent said ear but directed inwardly to pass through an aperture in the tubular member of the sprocket means to which said strip member is attached, said finger having a length and position such that when the strip member is depressed by cartridges it is displaced between cartridges on the inner adjacent sprocket means to rotate said adjacent sprocket means in a direction against the force of the drive means to thereby free the pressure on the cartridges in the feed ramps.

Conveniently each sprocket means is provided with the serrations directly in the outer periphery of the tubular member.

In a further embodiment the rotatably mounted members are concentrically arranged within the housing and the outermost member comprises a base plate and cartridge guide rails extending from said base plate which define substantially concentric cartridge paths and a bridge linking said paths. In such an embodiment the inner member is a driving means which comprises a spring driven rotor, and a pivotal pusher connected to said rotor for applying force to push the cartridges around said paths.

Preferably there is provided a connector having a part thereof attached to one of said members through which drive is capable of predeterminedly passing from one of said members to the other said member such that the members rotate together and wherein disconnection of said connector enables one member to rotate with respect to the other member. Advantageously both members are capable of carrying cartridges and the members are sprocket means each having an outer periphery having a plurality of serrations arranged to nest a plurality of cartridges. Conveniently the sprocket means comprise at least two circular, radially extending flanges axially spaced along a tubular member, each flange having serrations to nest a plurality of cartridges between said flanges.

Advantageously the housing is a plastic moulding which is pan-shaped and has a cover also formed by moulding plastics and conveniently a recessed track is formed in the housing and cover for locating and guiding the sprocket means.

Preferably the sprocket means are made from a plastics material.

In a preferred embodiment said housing has a peripheral wall defining a circularly cross-sectioned interior, a cover for the housing, a feed throat extending through said wall for releasing cartridges from said housing, and at least two rotatable concentric sprocket means, the sprocket means each comprising a concentric tubular member, at least two circular, radially extending flanges spaced therealong, each flange having serrations to nest a plurality of cartridges therebetween, a cartridge feed aperture in each tubular member except the innermost for permitting cartridges to pass from the inner sprocket means to

the other sprocket means, feed ramp means arranged to guide cartridges from each of the sprocket means to the feed throat, and a pusher mounted on the innermost sprocket means which is arranged to push those remaining cartridges not pushed by nested cartridges along the feed ramp means to the feed throat, wherein the pusher comprises a U-shaped member with the free ends thereof mounted on a pivot extending between the flanges of the innermost sprocket means, each limb of the U-shape being adjacent an associated flange and a rod located along the base of the U-shaped member which is nested in similar fashion to the cartridges on the flanges, whereby the length of the limbs of the U-shaped member is sufficient to enable the last cartridge in the magazine to be pushingly fed by the rod to the outer extremity of the feed throat.

Preferably there is provided a last round stop actuator comprising a spring biassed member located adjacent to a limb of the pusher for travelling with said limb, whereby the spring biassed member is extended outside the housing when said pusher rod is extended toward the outer extremity of the feed throat. Conveniently the last round stop actuator is a leaf spring having one end connected to the pivot of the pusher and the other end thereof connected to a button, whereby the button is adjacent and biassed toward the cover and protrudes therefrom when the rod is extended in the feed throat. Alternatively the last round stop actuator is a plunger and spring assembly located in the rod of the pusher arranged so that the plunger is adjacent and biassed toward the cover and protrudes therefrom when the rod is extended in the feed throat.

Conveniently the sprocket means are driven by a torsion spring, there being a central axle and a slot in the tubular member of the innermost sprocket means with said torsion spring tensioned therebetween.

Preferably stop means are provided for sequentially limiting the relative rotation between each of the sprocket means and the housing, which stop means serve to sequentially align the feed ramp means of the sprocket means in turn, starting with the outer sprocket means.

According to a feature of this invention there is provided a drum magazine for a gun including a stationary housing, an inner rotatably mounted member and an outer rotatably mounted member substantially concentric therewith, drive means for rotating the members in a first direction, stop means for limiting rotation of the outer member with respect to the housing, characterised by latch means between the outer member and the housing arranged to lock when the stop means limit the rotation of the outer member to thereby prevent rotation of the outer member in a counter direction to the first direction until the inner member is rotated in said counter direction a predetermined amount, said latch means including a connector having a part thereof attached to one of said members through which drive is capable of predeterminedly passing from one of said members to the other said member such that the members rotate together and wherein disconnection of said connector enables one member to rotate with respect to the other member.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which

Figure 3A shows in partial section a schematic view of a drum magazine in accordance with this invention,

Figure 3B is a cross-section along double arrow-headed line 3B—3B of Figure 3A, with the pusher removed,

Figure 3C is a view in the direction of double arrow-headed line 3C—3C of Figure 3B showing the arrangement of the stops for the intermediate and outer sprockets but with the cartridges removed,

Figure 4 is a view similar to Figure 3A but with the parts in different positions,

Figure 5A is a view similar to Figure 3A but with the parts in a different position,

Figure 5B is a detail of the encircled portion arrowed 5B in Figure 5A drawn to a larger scale and incorporating, in phantom lines, a part of the magazine well of the gun,

Figure 6 is a view similar to Figure 3A but with the parts in a different position,

Figure 7A is a view similar to Figure 3A but with the parts in a different position,

Figure 7B is a view along double arrow-headed line 7B—7B of Figure 7A,

Figure 8A is a top view of the housing,

Figure 8B is a view in the direction of arrow-headed line 8B of Figure 8A,

Figure 8C is a cross-sectional view along double arrow-headed line 8C—8C of Figure 8B,

Figure 9A is a side view of an outer sprocket,

Figure 9B is a cross-sectional view along double arrow-headed line 9B—9B of Figure 9A,

Figure 9C is a view in the direction of arrow-headed line 9C in Figure 9A,

Figure 10A is a side view of an intermediate sprocket,

Figure 10B is a view in the direction of arrow-headed line 10B of Figure 10A,

Figure 10C is a view in the direction of arrow-headed line 10C of Figure 10A,

Figure 11A is a plan view of an inner sprocket,

Figure 11B is a view along double arrow-headed line 11B—11B of Figure 11A,

Figure 12A is a top plan view of a cover,

Figure 12B is a cross-sectional view along double arrow-headed lines 12B—12B of Figure 12A,

Figure 12C is a view in the direction of arrow headed-line 12C of Figure 12A, and

Figure 13 is a partial view of an alternative last round stop actuator.

In the Figures 3A—13 like references denote like parts.

In the Figures 3A, 4, 5A, 6 and 7A the cartridges are denoted by the prefix C so it will be seen from Figure 3A that in the fully loaded position the magazine holds 100 cartridges.

The drum magazine shown in Figures 3A to 7B has a circularly cross-sectioned, pan-shaped housing 40 having a cover 41 within which is concentrically mounted an outer sprocket 42, an intermediate sprocket 43, and an inner sprocket 44. The drum, cover and each of the sprockets are made from moulded plastics and each of the sprockets is spool-shaped having a central tubular body and at each end of the body is a radially extending flange each having a like number of serrations around the outer periphery for holding cartridges. The serrations in the flanges adjacent a base 404 of the housing have a greater radial extent than the serrations in the arms adjacent the cover 41 to allow for the taper of a cartridge and so that the cartridge axes are approximately parallel to the axis of the housing. The inner sprocket 44 has serrations to hold each of cartridges C1—C24, the intermediate sprocket 43 has a serration to hold each of cartridges C27—C57 and the outer sprocket 42 has a serration to hold each of cartridges C60—C98. In the assembled position, shown in Figures 3A—7B, the sprockets are located in the housing 40 so that feed ramps 434, 441 on the housing, 455, 455′ on the outer sprocket, and 471, 471′ on the intermediate sprocket adopt the positions shown in Figure 3A and the feed ramp 434 extends to the base of cartridge C98, the feed ramp 455′ extends to the base of cartridge C58 and the feed ramp 471′ extends to the base of cartridge C25. In this way the feed ramps are effective to scoop up the cartridges in the sprockets with which the ramps are associated and the ramps 441, 455′, 471′ act as guides for the cartridges. Mounted to be fixed on the axis of the housing 1 is a nylon spindle 45 secured to the housing and cover respectively by screws 400,401. The spindle has an ear 402 to which is secured one end of a sheet metal clock-type torsion spring 46, the other end of the spring 46 being secured to an aperture 403 in the inner sprocket 44.

As best shown in Figures 7B and in phantom lines in Figure 11A, a pusher 47 is mounted on the inner sprocket 44. The pusher 47 has a spindle 405 positioned between the arms of the inner sprocket and pivotally mounted on the spindle 405 is a U-shaped arm 406 with the limbs of the U-shape within the confines of the inner sprocket flanges and adjacent a respective flange. The free ends of the U-shape are secured to the spindle 405 and a rod 407 having the approximate shape of a cartridge is welded to the base of the U-shape. The rod 407 has a tail 408 which is locatable in a serration of the inner sprocket and a bevelled top portion 409 (as viewed in Figure 7B) remote from the tail 408 to facilitate a bolt of the gun to which the magazine is secured to ride over the rod 407. Connected to the spindle 405 between the U-shaped arm 406 and the wing of the inner sprocket adjacent the cover 41 is a last round stop actuator 48 comprising a spring arm 413 which is biassed toward the cover 41 and a button 414 which may contact a mechanism within a gun receiver to which the magazine is mounted so that when the last cartridge from the magazine is fired the bolt mechanism can be held in the cocked position. It is in the event that the last round stop actuator fails to operate the mechanism within the gun receiver that the bevelled portion 409 is provided so that the bolt will strike the pusher obliquely to the bevel. The tail 408 of the pusher is extended so that it may co-operate with a sprocket latch, as will be described later herein.

The housing 40 has a feed throat 415 defined by a neck 416 having longitudinal sides in the axial direction of the housing and which is arranged to be located in the magazine well of a gun. The neck 416 has, on its right hand side (as viewed in Figures 3A and 4—7A), a pivotal lip 417 and on its left hand side an arcuate, fixed lip 418 extending over the feed throat. Referring particularly to Figure 5B, the neck of the magazine is shown located in a well of a gun (the well being shown in phantom lines). The pivoting lip 417 is mounted on an axle 419 and has an arm 420 with an arcuate upper surface 421, generally the same radius as a cartridge, and a tail 422 of such a length that, when the magazine is inserted into the well of a gun, the tail prevents rotation of the lip 417 so that it is not possible for the lip 417 to adopt the position shown in solid line in Figure 5B when mounted in the gun well. The lip 417 is biassed by a spring (not shown) so that the bottom of the lip (as viewed in Figure 5B) is normally horizontal, as shown in phantom lines. The distance between the lips 417 and 418 is arranged so that with the lip 417 spring biassed in a clockwise direction (as shown in Figure 4 for example and in Figure 5B in phantom lines) it is not possible for a cartridge to be removed from above the lips so the cartridges may not fall out of the magazine. When the magazine is removed from the gun the cartridge may, however, be unloaded from the magazine in a direction perpendicular to the cartridge longitudinal axis by depressing lip 417. In use, the cartridges are axially slid from the magazine by a bolt of the gun. A latching mechanism is provided to secure the magazine to the well of the gun and, conveniently, such a mechanism comprises a pair of pins which may be slidably mounted through one of the walls of the magazine well into co-operating holes in the neck 416 of the housing, these holes being referenced 423 in Figure 8A and one of the pins being shown in phantom lines in Figure 5B.

The pan-shaped housing 40, shown in Figure 8A, 8B and 8C has an open top 424 to which the cover 41 is connected by internally screw threaded bosses 425 and located by pins 426 on each side of the neck 416. The housing 40 has a large internal diameter portion 427 for accommodating the body of the cartridge in the outer sprocket and a reduced internal diameter portion 428 in the region of the nose (bullet) portion of the cartridge and the portion 428 is connected to a base 429. The base has a circular protrusion 430, the interior of which acts as a bearing surface upon which the outer sprocket 42 and inter-

mediate sprocket 43 rotate. In this respect, the concentric protrusion 430 has a radially outer side 444 to concentrically locate the outer sprocket 42 and an inner side 445 to locate the intermediate sprocket 43 in a concentric fashion. The base 429 is dished to provide an inner boss 431 providing a bearing surface 432 and a concentric guide surface 433 for the inner sprocket 44. On the axis of the drum in the boss 431 is a hole for the screw 400. The fixed lip 418, as best seen in Figure 8A, is tapered inwardly of the housing so as to permit cartridges which are trapped by the lips 417, 418 to be tilted such that the bullet is angled upwardly, the relieved portion of the fixed lip 418 permitting the cartridge body to rise slightly higher than the region of the cartridge toward the cannelore. This allows the cartridge to assume an ever increasing upward angle as it is driven in operation forwardly by the bolt so that it can enter the chamber smoothly without the base or cannelore end being forced downwardly. Such action is in distinction to the usual feed path of conventional magazines where, as the cartridge is driven forwardly, the bullet end is forced upwardly as it enters a feed ramp and the base end goes downwardly. This is because the forward corner of the conventional feed lip contacts the center, body, portion of the cartridge and acts as a fulcrum so that as the bullet end rises the base end is forced downward, thus causing the other cartridges in the magainze to be pushed downward in the magazine. In magazines of large capacity such reversing action (driving the bulk of the cartridges backwardly) requires substantial short term energy and has the undesirable effect of retarding bolt motion.

On the side of the feed throat 415 adjacent the fixed lip 418 is a feed ramp 434 having at its outer side a notch 435 to accommodate the serrations of the outer sprocket and at the inner side of the feed ramp 434 is a web guide 436 for the cartridges. Also provided on the same side of the throat as the fixed lip is a stop 437 for the outer sprocket. The pivoting lip 417 is located in a cutout defined by side walls 438 and 439 and a bottom part 440, the side wall 439 having an internal ramp portion 441 which also acts as a guide for feed ramp 434. A hole 442 in both side walls 438, 439 is for the axle 419 of the pivoting lip 417. Both sides of the feed throat 415 have notches 433 which, in operation, abut against respective stop pins in the well of the gun to limit the extent of insertion of the magazine into the receiver.

As shown in Figure 8B, the internal diameter portion 428 has a recess 446 for co-operating with a latch 447 being in the form of a strip member provided on the outer sprocket. Alternatively, instead of a recess, an aperture could be provided.

Referring now to Figures 9A, 9B and 9C, the outer sprocket 42 has a tubular body 448 with flanges 449, 450 each having a like number of serrations 451 in which are located, between the flanges 449, 450 cartridges. For reasons discussed earlier, the serrations in flange 449 have a greater radial extent than those in flange 450. The body 448 has a reduced diameter portion 452 which sits within the internal diameter portion 428 of the housing and a concentric bearing surface 453 which engages the internal side of the protrusion 430. The body 448 has a feed aperture 454 to permit cartridges from the intermediate and inner sprockets to pass therethrough. The feed aperture 454 has feed ramps 455, 455' and a guide ramp 456 arranged to tilt the cartridge so that the bullet portion is inclined outwardly of the feed aperture 454. Located in the reduced diameter portion 452 is a stop 457 presenting a stop surface 458 for contacting the stop 437 of the housing and a further stop surface 459 for co-operating with a stop on the intermediate sprocket. The wall of the portion 452 has an aperture 460 shaped to house the latch 447 and to form a lip 461 against which a claw on a latch 462, connected to the intermediate spool, co-operates. Transversely to the aperture 460 is a hole 463 in a boss for a pin pivotally locating the latch 447. The reduced diameter portion 452 is arranged to locate the neck of a cartridge so as to maintain the cartridge with the required amount of tilt in the magazine. The latch 447 is bent into the shape of a dog leg so that it is able to overlap the latch 462.

The intermediate sprocket 43, shown in Figures 10A, 10B and 10C, is similar to the outer sprocket 42 and has a body 464 with a reduced diameter portion 465 and serrated flanges 466 and 467 between which cartridges are held. The radial extent of the serrations in flange 466 is greater than that of those in flange 467 for the reason discussed earlier. The end face of the reduced diameter portion 465 has a bearing surface 468 for rotating on the surface 430 of the housing and a recessed annular part 469, the inner periphery of which acts as a concentric guide surface to abut the inner side 445 of the housing. The intermediate sprocket has a feed aperture 470 having feed ramps 471, 471' and in which is disposed a cartridge 499 that is tilted by a guide ramp 472, as described in relation to the outer sprocket 42. The guide ramp 471' extends interiorally of the body 464. A stop 473 having a stop surface 474 for contacting the stop 459 on the outer sprocket 42 is provided on the reduced diameter portion 465 and in the side wall of the reduced diameter portion 465 is an aperture 475 for the latch 462 and a hole 476 is provided in a boss for a pin locating the latch 462.

The inner sprocket 44, shown in Figures 11A and 11B, has a body 477' with serrated side flanges 477, 478 and the body 477' has the rectangular aperture 403 within which one end of the spring 46 is located. The radial extent of the serrations in flange 477 is greater than that in the flange 478 to tilt the cartridge (shown in phantom lines). In the position between which the cartridges C1 and C25 (shown in phantom lines) are located is a notch 479 in the arm 477 within which the rod 407 of the pusher is locatable. A hole 480 is provided in each of the arms 477 and 478 for the

spindle 405 of the pusher.

The latches 447 and 462 are both formed from strip material and, as best shown in Figure 4, both mounted on a respective pivot 481 and both biassed by a respective torsion spring 482, one end of which engages with an edge of slot 460, 475 respectively and the other end of which is bent into an L-shape and engages a tang 483, 484 respectively of the latches 447 and 462. At the end of the latches 447, 462, remote from the tangs, is a finger 485, 486 respectively and a protruding ear 487, 488 respectively; the ear 487 engaging with a lip 489 on the recess 446 of the housing 40 and the ear 488 being arranged to engage with the lip 461 on the outer sprocket 42 (as shown in Figure 6). The fingers 485 and 486 are both shaped to be inserted between cartridges C28 and C29 and between cartridges C2 and C3 respectively and to bear against cartridges C28 and C2 respectively. The tangs 483 and 484 have a radius portion which is arranged to be engaged by cartridge C26 and the rod 407 of the pusher 47 respectively.

Referring now to Figures 12A, 12B and 12C, the cover 41 is a moulding made from clear plastics having a circular shape with six holes 490 located in protrusions of the cover for securing the cover to the housing 40. The cover has an axial hole 491 formed with notches 492 which act as a keyway for the spindle 45 and prevent the spindle 45 from rotating. The region surrounding the hole 491 is dished to provide a recess for the head of screw 401 and the underside of the cover has concentric ring slots 493, 494 for the flanges 450, 467 of the outer and intermediate sprockets respectively. To facilitate the provision of the slots 493, 494 the cover is locally thickened. Shown symmetrically about the horizontal axis in Figure 12A is a key 410 formed from ribs 411 with a root radius 412 between the ribs and the planar part of the cover. The cover has a neck 495 corresponding in part to the neck 416 of the housing and positioned partially down the neck and extending toward the hole 491 is a guide cover 496 which is chamfered toward the cover outer surface (as best shown in Figure 7B) to guide the actuator 48 in and out of the housing. The region 497 on each side of the ribs 411 is relieved to provide an improved depth of the ribs 411 upon which a keyway on the gun receiver may engage and because of slots 493 and 494, arcuate apertures 498 are formed. The guide cover 496 is recessed to provide a slot 496' of such depth that the cover 496 clears a normally provided last round stop in the gun receiver. The confluence of the relieved portion 497 and the thickened portion of the cover has a bevelled edge 497' to ease the location of the magazine onto the receiver keyway. The neck 495 is of such a length that it partially covers a top most cartridge to prevent the cartridge from moving rearwardly. Holes 490' are provided on the neck 495 within which the pins 426 on the housing are located and a protruding pin 491' extending on the underside of the cover forms part of the feed ramp for the cartridges. A water drain hole 492' is provided on the inside surface of the cover.

In the position shown in Figure 3A, the latches 447 and 462 are held downwardly by cartridges C64 and C30 respectively and the fingers 485 and 486 respectively are, thus, forced between cartridges C28, C29 and C2, C3 respectively. The action and purposed of the fingers 485 and 486 will be described later.

In operation, the spring 46 drives the sprockets in an anti-clockwise direction (as viewed in the Figures 3A, 4, 5A and 6) so that starting with the magazine fully loaded, as shown in Figure 3A, cartridge C2 pushes on finger 486 which, because latch 462 is connected by pivot 481 to the intermediate sprocket 43, causes sprocket 43 to rotate in an anti-clockwise direction. The turning effort of intermediate sprocket 43 is, thus, applied to cartridge C28 which, in turn, applies a pressure through finger 485 of latch 447 to the outer sprocket 42 which, thus, also is rotated in an anti-clockwise direction.

The rotation of the outer sprocket 42 causes cartridge C98, located in a serration of the flanges 449, 450, to push against cartridges C99 and C100 and the cartridge C100 is prevented from being ejected from the throat 415 of the magazine by the lips 418, 417. It will, thus, be seen that the dimension between the lips 417, 418 is extremely important.

When the magazine is inserted into a gun magazine well (as shown in Figure 5B) the magazine is held in position by pins (shown in phantom lines) which locate in the holes 423. Assuming that the bolt has been cocked, then on releasing the gun trigger the bolt moves forwardly toward the barrel and a stripping lug associated with the bolt slidingly removes the cartridge C100 from the lips 417, 418 in a direction perpendicular to the plane of the Figure 3A, i.e., in a direction from right to left in Figure 3B which is also in the direction of the housing axis. The cartridge C100 is, thus, pushed from the magazine into the chambers. Due to continued force being exercised by the spring 46 on the sprockets, so the sprockets rotate in an anti-clockwise direction and cartridge C99 is moved upwardly to be held by the lips 417, 418 and cartridge C98 is, thus, scooped out of the serrations in flanges 449, 450 by the ramps 435. This action continues until the outer sprocket 42 has given up all of its cartridges C98—C60 and the stop surface 458 on outer sprocket 42 contacts stop 437 on the housing 40 (as shown in Figure 3C). The positions of the stops 437 and 457 are such that the feed ramps 434 and 441 on the housing align with feed ramps 455' and 455 respectively of the outer sprocket 42. Whilst the outer sprocket was rotating and when cartridges C64, C63, C62 are de-nested and move up the ramp 434, so the latch 447, which has heretofore been held depressed by cartridges C64, C63, C62 is released and is biassed by spring 482 so that the ear 487 abraids the internal diameter portion 427 of the housing and continued rotation is such that when the stop surface 458 abuts stop 437 so the ear 487 engages lip 489 and the outer sprocket 42 is prevented from rotating clockwise.

The parts of the magazine are, thus, in the position shown in Figure 4.

Continued feeding of the cartridges from the feed lips causes those cartridges on the intermediate sprocket 43 to be expended and the arrangement to adopt the position shown in Figure 5A with the cartridge C30 being scooped by ramp 455' to move up the feed ramps 455', 455. Continued rotation of the inner sprocket 44 causes the stop surface 474 of stop 473 on the intermediate sprocket 43 to abut the stop surface 459 on the outer sprocket (as shown in Figure 3C) and the feed ramps 471', 471 of the intermediate sprocket 43 to align with the feed ramps 455', 455 respectively of the outer sprocket 42 (as shown in Figure 6) and the latch 462 is spring biassed so that the ear 488 engages with the lip 461 on the outer sprocket 42.

Continued release of the cartridges causes further rotation of the inner sprocket 44 so the cartridges C24—C1 pass up the feed ramps 471', 471, 455', 455, 434 and 441 and because there are no further cartridges to push cartridges C6—C1 up the feed ramps so the rod 407 of the pusher 47 is scooped up by the feed ramp 471' to push these cartridges up to the feed lips, the length of the arm 406 being such that the rod is able to extend to the feed lips 417, 418 (as shown in Figures 7A and 7B). Connected at one side of the arm 406 is the last round stop actuator 48 and as the pusher 47 extends up the feed ramp so the spring arm 413, which is biassed against the guide cover 496 on the cover 41, moves with the arm upwardly and outwardly through the slot 496' in the cover. Until the pusher starts to move, the last round stop actuator 48 is mounted alongside the U-shaped arm 406 of the pusher. The action of the last round stop actuator button 414 is to move a bolt latch in the gun to latch the bolt assembly in an open position so that when the next magazine is inserted in the gun the bolt is already cocked.

To load the magazine, cartridges are inserted through the feed throat 415 in a direction perpendicular to the housing axis so that the cartridges are inserted into the upper surface 421 of the spring biassed pivoting lip 417 and downward pressure on the cartridges causes the pusher 407 to be partially depressed and the lip 417 to be rotated to the position shown in solid lines in Figure 5B. After loading six cartridges the pusher 47 is laid in its rest position on the inner sprocket and the insertion of further cartridges cause the cartridge C1 to be nested in the first of the serrations on the inner sprocket 44. The action of depressing the pusher 47 is, of course, against the force exerted by spring 46 and as the cartridges C1—C24 are nested in their associated serrations so the inner sprocket 44 is rotated in a clockwise direction. When cartridge C30 is inserted in to the feed lips the pusher tail 408 contacts tang 484 on the latch 462 and thereby rotates the latch 462 so that the ear 488 is dis-engaged from the lip 461. The intermediate sprocket 43 is, thus, free to rotate in a clockwise direction and, with the insertion of cartridges C31 and C32, adopts the position shown in Figure 5A. Referring to Figure 5A, the insertion of cartridges C31 and C32 causes cartridges C28, C29 to depress the latch 462 so that the finger 486 is inserted between the cartridges C2, C3 (see Figure 4). Continued clockwise rotation of the intermediate spool 43 and inner spool 44 causes the latch 462 to be fully depressed by cartridges C30, C29, C28 and the finger 486 to be firmly pushed between cartridges C2, C3, and to bear against cartridge C2.

The function of the finger 486 is as follows:

With the parts shown in the positions of Figure 5A the spring 46 exerts a pressure through cartridges C24, C25 and C26, causing cartridge C26 to be forced against the inner wall of the outer sprocket 42, thus resulting in undesirable friction. However, with the downward pressure of cartridge C30 on the latch 462, as shown in Figure 4, so finger 486 pulls cartridge C2 and, thus, the inner sprocket 44 in a clockwise direction relative to the intermediate sprocket 43. In this manner, the pressure from spring 46 upon cartridges C24, C25, and C26 is released and the cartridges C25, C26 have a small amount of freedom within the feed ramps 471' and 471 and the forementioned undesirable friction is removed.

Continued feeding of cartridges into the feed throat 415 causes both inner sprocket 44 and intermediate sprocket 43 to be rotated in a clockwise direction until cartridge C26 is rotated so that it abuts the tang 483 on latch 447. The latch 447 is, thus, rotated against the bias of its associated spring 482 so that the ear 487 is moved out of abutting contact with the lip 489 and, thus, permitting the outer sprocket 42 to rotate in a clockwise direction. The position shown in Figure 4 is where the cartridge C26 is about to abut the tang 483. Continued filling with cartridges is such that the cartridges C64, C63, C62 force the finger 485 of latch 447 to pull the cartridge C28 in a clockwise direction and, hence, the intermediate sprocket 43 is moved in a clockwise direction relative to the outer sprocket 42 and the cartridges C57, C58 and C59 are freed from a tight fit against one another, in similar manner to the action of finger 486 upon cartridges C24, C25 and C26. Thus, the cartridges C58 and C59 have a small degree of freedom within the feed ramps 455' and 455 and undesirable friction between C59 and the inner wall of the housing 40 is eliminated. Thus, all of the cartridges in the magazine are loosely held in the serrations or feed ramps and frictional forces are reduced to a minimum. The magazine is completely filled by inserting cartridges up to C100 and the magazine is then in the position shown in Figure 3A.

It is to be understood that the provision of the latches 447 and 462 is not necessary to the working of the invention, although they are considered to be extremely desirable for the dual function they each perform. In this respect, the ears 487, 488, in conjunction with lips 489, 461 respectively, prevent rotation of sprockets 42, 43 respectively to permit the magazine to be loaded through the feed throat 415. Secondly, the fingers

485, 486 of the latches permit drive from the intermediate sprocket to the outer sprocket to be through the latch 447 and from the inner sprocket to the intermediate sprocket through the latch 462 respectively, thereby enabling all of the cartridges in the magazine except cartridges C100, C99 to have a small amount of freedom of movement within the magazine. Having described the function and operation of the latches, it will be realised by those skilled in the art that latches having similar functions, although possibly requiring differing components to perform each of the two functions could be designed, with advantage, for use with the Soumi-type magazine.

Referring now to Figure 13, there is shown an alternative form of last round stop actuator in which a compression spring 413' and plunger 414' are inserted in a bore of the rod 407. The action of the plunger 414' is such that as the rod 407 moves up the feed ramp so the plunger 414' is extended by the force of spring 413' and when the arm 406 is fully extended so the plunger 414' abuts the last round stop mechanism in the gun receiver.

Reference is also directed toward our co-pending European patent Application No. 84101403.8 which is directed toward a further aspect of the drum magazine described herein.

Claims

1. A drum magazine for a gun including a stationary housing (40), an inner rotatably mounted member (43) and an outer rotatably mounted member (42) substantially concentric therewith, drive means (46) for rotating the members in a first direction, stop means (437, 458) for limiting rotation of the outer member (42) with respect to the housing (40) characterised by latch means (447, 489) between the outer member (42) and the housing (40) arranged to lock when the stop means (437, 458) limit the rotation of the outer member (42) to thereby prevent rotation of the outer member (42) in a counter direction to the first direction until the inner member (43) is rotated in said counter direction a predetermined amount.

2. A drum magazine as claimed in claim 1, characterised in that said members (42, 43) each comprise a substantially concentric sprocket means, each said sprocket means including a tubular member (448, 464, 477') and having an outer periphery provided with a plurality of serrations (451) arranged to nest a plurality of cartridges.

3. A drum magazine as claimed in claim 2, characterised in that more than two sprocket means (42, 43, 44) are provided, and the stop means comprise abuttable stop members (437, 458, 459, 474) provided between the housing (40) and the outermost sprocket means (42) and between adjacent sprocket means except between the innermost sprocket means (44) and the sprocket means (43) adjacent thereto.

4. A drum magazine as claimed in claim 3, characterised in that further latch means (461, 462) are provided between adjacent sprocket means except between the innermost sprocket means (44) and the sprocket means (43) adjacent thereto, each said latch means being engageable when the cooperating stop members (437, 458, 459, 473) abut each other such that each said latch means prevent rotation of an associated latched sprocket means until the serrations thereof are required to be filled with cartridges.

5. A drum magazine as claimed in claim 4, characterised in that the latch means between the housing and the outermost sprocket means comprise a strip member (447) pivotally connected to the outermost sprocket means (42) and spring biassed toward the inner peripheral wall of the housing, and a recess or aperture (446) in said peripheral wall, the strip member having an ear (487) for engaging with the lip (489) of the recess or aperture when the stop members (437, 458) associated with the housing and the outermost sprocket means abut.

6. A drum magazine as claimed in claim 5, characterised in that the further latch means between adjacent sprocket means comprise a strip member (462) pivotally connected to the inner of the two adjacent sprocket means (43) which is spring biassed toward the inner wall of the tubular member of the adjacent outer sprocket means (42), and a recess or aperture (460) in said inner wall, the strip member of the further latch means having an ear (488) for engaging with a lip (461) of the recess or aperture in said inner wall when the stop members (459, 474) associated with the adjacent sprocket means abut.

7. A drum magazine as claimed in claim 5 or 6, characterised in that said strip member (447, 462) has a tang (483, 488) on the opposite side of the associated pivot from the ear (487, 488) which tang passes through the tubular member of the sprocket means to which it is attached and toward the adjacent inner sprocket means, whereby the tang is arranged to have a length sufficient to be contacted by a cartridge on said adjacent inner sprocket means for the strip member to be rotated thereby such that the ear of the strip member disengages its associated lip and permits the sprocket means to which the strip member is attached to rotate.

8. A drum magazine as claimed in claim 7, characterised in that the strip member (447, 426) is located in the wall of the tubular member of the sprocket means (42, 43) to which the strip member is attached and arranged to be depressed therein by cartridges on said sprocket means.

9. A drum magazine as claimed in any of claims 2 to 8, characterised in that the sprocket means (42, 43, 44) each comprise the tubular member (448, 464, 477') with at least two circular, radially extending flanges (449, 450, 466, 467, 477, 478) spaced therealong, each flange having serrations (451) arranged to nest a plurality of cartridges therebetween, the serrations of the innermost

sprocket means (44) being spaced from the inner surface of the next adjacent outer sprocket means (43) by substantially the same distance as the serrations of the outermost sprocket means (42) are from the housing interior peripheral wall (427), a cartridge feed aperture (454, 470) in each tubular member except the innermost for permitting cartridges to pass through the apertured tubular members (448, 464, 477') and feed ramps (434, 441, 455, 455', 471, 471') arranged to guide cartridges from each of the sprocket means to a feed throat (415) of the housing.

10. A drum magazine as claimed in claim 9, characterised in that the strip member (447, 462) has a finger (485, 486) adjacent said ear but directed inwardly to pass through an aperture (460, 475) in the tubular member of the sprocket means (42, 43) to which said strip member is attached, said finger having a length and position such that when the strip member is depressed by cartridges it is displaced between cartridges on the inner adjacent sprocket means to rotate said adjacent sprocket means in a direction against the force of the drive means (46) to thereby free the pressure on the cartridges in the feed ramps.

11. A drum magazine as claimed in any of claims 2 to 10, characterised in that each sprocket means (42, 43, 44) is provided with the serrations (451) directly in the outer periphery of the tubular member (448, 464, 477').

12. A drum magazine as claimed in claim 1, characterised in that the rotatably mounted members are concentrically arranged within the housing and the outermost member comprises a base plate and cartridge guide rails extending from said base plate which define substantially concentric cartridge paths and a bridge linking said paths.

13. A drum magazine as claimed in claim 12, characterised in that the inner member is a driving means which comprises a spring drive rotor, and a pivotal pusher connected to said rotor for applying force to push the cartridges around said paths.

14. A drum magazine for a gun as claimed in claim 1, characterised in that there is provided a connector (447) having a part thereof attached to one of said members (43) through which drive is capable of predeterminedly passing from one of said members (43) to the other said member (42) such that the members rotate together and wherein disconnection of said connector enables one member to rotate with respect to the other member.

15. A drum magazine as claimed in claim 14, characterised in that both members (42, 43) are capable of carrying cartridges.

16. A drum magazine as claimed in claim 15, characterised in that the members are sprocket means (42, 43) each having an outer periphery having a plurality of serrations (451) arranged to nest a plurality of cartridges.

17. A drum magazine as claimed in claim 16, characterised in that the sprocket means comprise at least two circular, radially extending flanges (449, 450; 466, 467) axially spaced along a tubular member (448; 464), each flange having serrations (451) to nest a plurality of cartridges between said flanges.

18. A drum magazine as claimed in claim 2, characterised in that the housing (40) is a plastic moulding which is pan-shaped and has a cover (41) also formed by moulding plastics.

19. A drum magazine as claimed in claim 18, characterised in that a recessed track (430, 493, 494) is formed in the housing and cover for locating and guiding the sprocket means.

20. A drum magazine as claimed in claim 2, characterised in that the sprocket means (42, 43, 44) are made from a plastics material.

21. A drum magazine for a gun as claimed in claim 2, characterised in that said housing (40) has a peripheral wall (427) defining a circularly cross-sectioned interior, a cover (41) for the housing, a feed throat (415) extending through said wall for releasing cartridges from said housing, and at least two rotatable concentric sprocket means, the sprocket means each comprising a concentric tubular member (448, 464, 477'), at least two circular, radially extending flanges (449, 450, 466, 467, 477, 478) spaced therealong, each flange having serrations (451) to nest a plurality of cartridges therebetween, a cartridge feed aperture (454, 470) in each tubular member except the innermost for permitting cartridges to pass from the inner sprocket means to the other sprocket means, feed ramp means (434, 441, 455, 455', 471, 471') arranged to guide cartridges from each of the sprocket means (42, 43, 44) to the feed throat (415), and a pusher (47) mounted on the innermost sprocket means (44) which is arranged to push those remaining cartridges not pushed by nested cartridges along the feed ramp means to the feed throat, wherein the pusher comprises a U-shaped member (406) with the free ends thereof mounted on a pivot (405) extending between the flanges of the innermost sprocket means (44), each limb of the U-shape being adjacent an associated flange (477, 478) and a rod (407) located along the base of the U-shaped member which is nested in similar fashion to the cartridges on the flanges, whereby the length of the limbs of the U-shaped member is sufficient to enable the last cartridge in the magazine to be pushingly fed by the rod to the outer extremity of the feed throat (415).

22. A drum magazine as claimed in claim 21, characterised by a last round stop actuator (48) comprising a spring biassed member (414) located adjacent to a limb of the pusher (47) for travelling with said limb, whereby the spring biassed member is extended outside the housing (40) when said pusher rod (407) is extended toward the outer extremity of the feed throat (415).

23. A drum magazine as claimed in claim 22, characterised in that the last round stop actuator is a leaf spring (413) having one end connected to the pivot (405) of the pusher and the other end thereof connected to a button (414), whereby the

button is adjacent and biassed toward the cover (41) and protrudes therefrom when the rod (407) is extended in the feed throat (415).

24. A drum magazine as claimed in claim 22, characterised in that the last round stop actuator is a plunger (414') and spring assembly (413') located in the rod of the pusher (407) arranged so that the plunger is adjacent and biassed toward the cover and protrudes therefrom when the rod (407) is extended in the feed throat (415).

25. A drum magazine as claimed in claim 2, characterised in that the sprocket means (42, 43, 44) are driven by a torsion spring (46), there being a central axle (45) and a slot (403) in the tubular member (477') of the innermost sprocket means (44) with said torsion spring tensioned therebetween.

26. A drum magazine as claimed in claim 21, characterised in that stop means (437, 457, 473) are provided for sequentially limiting the relative rotation between each of the sprocket means (42, 43, 44) and the housing (40), which stop means serve to sequentially align the feed ramp means (434, 441, 455, 455', 471, 471') of the sprocket means in turn, starting with the outer sprocket means (42).

27. A drum magazine for a gun including a stationary housing (40), an inner rotatably mounted member (43) and an outer rotatably mounted member (42) substantially concentric therewith, drive means (46) for rotating the members in a first direction, stop means (437, 458) for limiting rotation of the outer member with respect to the housing, characterised by latch means (447, 489) between the outer member (42) and the housing (40) arranged to lock when the stop means (437, 458) limit the rotation of the outer member (42) to thereby prevent rotation of the outer member in a counter direction to the first direction until the inner member (43) is rotated in said counter direction a predetermined amount, said latch means including a connector (447) having a part thereof attached to one of said members (43) through which drive is capable of predeterminedly passing from one of said members (43) to the other said member (42) such that the members rotate together and wherein disconnection of said connector enables one member to rotate with respect to the other member.

Revendications

1. Chargeur à tambour pour une arme à feu comprenant un boîtier fixe (40), un élément intérieur monté à rotation (43) et un élément extérieur monté à rotation (42) en substance concentriquement au premier, un moyen d'entraînement (46) pour faire tourner les éléments dans un premier sens, des moyens d'arrêt (437, 458) pour limiter la rotation de l'élément extérieur (42) par rapport au boîtier (40), caractérisé par des loquets de verrouillage (447, 489) entre l'élément extérieur (42) et le boîtier (40) propres à se bloquer lorsque les moyens d'arrêt (437, 458) limitent la rotation de l'élément extérieur (42) afin d'empêcher ainsi la rotation de l'élément extérieur (42) dans un sens contraire au premier sens jusqu'à ce que l'élément intérieur (43) soit tourné dans le sens contraire dans une mesure prédéterminée.

2. Chargeur à tambour suivant la revendication 1, caractérisé en ce que les éléments (42, 43) comprennent chacun des rouleaux dentés en substance concentriques, chaque rouleau denté comprenant un élément tubulaire (448, 464, 477') et présentant une périphérie extérieure pourvue de dentelures (451) propres à recevoir plusieurs cartouches.

3. Chargeur à tambour suivant la revendication 2, caractérisé en ce que plus de deux rouleaux dentés (42, 43, 44) sont prévus et les moyens d'arrêt comprennent des arrêts pouvant être aboutés (437, 458, 459, 474) prévus entre le boîtier (40) et le rouleau denté extérieur (42) et entre des rouleaux dentés adjacents sauf entre le rouleau denté intérieur (44) et le rouleau denté (43) adjacent.

4. Chargeur à tambour suivant la revendication 3, caractérisé en ce que d'autres loquets de verrouillage (461, 462) sont prévus entre des rouleaux dentés adjacents sauf entre le rouleau denté intérieur (44) et le rouleau denté adjacent (43), chaque loquet de verrouillage pouvant être engagé lorsque les arrêts coopérants (437, 458, 459, 473) se touchent de telle sorte que chaque loquet de verrouillage empêche un rouleau denté verrouillé associé de tourner jusqu'à ce que ses dentelures doivent être remplies de cartouches.

5. Chargeur à tambour suivant la revendication 4, caractérisé en ce que le loquet de verrouillage entre le boîtier et le rouleau denté extérieur comprend une bande (447) articulée au rouleau denté extérieur (42) et rappelée élastiquement vers la paroi périphérique intérieure du boîtier, et un évidement ou une ouverture (446) dans la paroi périphérique, la bande comportant une oreille (487) destinée à attaquer la lèvre (489) de l'évidement ou de l'ouverture lorsque les arrêts (437, 458) associés au boîtier et au rouleau denté extérieur se touchent.

6. Chargeur à tambour suivant la revendication 5, caractérisé en ce que l'autre loquet de verrouillage prévu entre des rouleaux dentés adjacents comprend une bande (462) articulée au rouleau denté intérieur (43) des deux rouleaux adjacents qui est rappelée élastiquement ver la paroi interne de l'élément tubulaire du rouleau denté extérieur (42) et un évidement ou une ouverture (460) dans la paroi interne, la bande de l'autre loquet de verrouillage comportant une oreille (488) destinée à attaquer une lèvre (461) de l'évidement ou de l'ouverture dans la paroi interne lorsque les arrêts (459, 474) associés au rouleau denté adjacent se touchent.

7. Chargeur à tambour suivant la revendication 5 ou 6, caractérisé en ce que la bande (447, 462) comporte un bec (483, 484) du côté du pivot associé opposé à l'oreille (487, 488) et ce bec traverse l'élément tubulaire du rouleau denté auquel il est attaché et s'étend en direction du rouleau denté intérieur adjacent, le bec ayant un

longueur suffisante pour entrer en contact avec une cartouche sur le rouleau denté intérieur adjacent afin de faire pivoter la bande de telle sorte que l'oreille de cette bande dégage sa lèvre associée et permettre au rouleau denté auquel la bande est attachée de tourner.

8. Chargeur à tambour suivant la revendication 7, caractérisé en ce que la bande (447, 462) est montée dans la paroi de l'élément tubulaire du rouleau denté (42, 43) auquel la bande est attachée et peut être abaissée dans ce rouleau par des cartouches se trouvant sur le rouleau denté.

9. Chargeur à tambour suivant l'une quelconque des revendications 2 à 8, caractérisé en ce que les rouleaux dentés (42, 43, 44) comprennent chacun un élément tubulaire (448, 464, 477') avec au moins deux joues radiales circulaires (449, 450, 466, 467, 477, 478) espacées le long de ces éléments, chaque joue comportant une dentelure (451) et les dentelures étant agencées de manière à recevoir plusieurs cartouches entre elles, les dentelures du rouleau denté intérieur (44) étant espacées de la surface interne du rouleau denté extérieur adjacent suivant (43) en substance de la même distance que celle qui sépare les dentelures du rouleau denté extérieur (42) de la paroi périphérique intérieure (427) du boîtier, une ouverture d'alimentation de cartouche (454, 470) dans chaque élément tubulaire à l'exception de l'élément tubulaire intérieur permettant aux cartouches de passer au travers des éléments tubulaires à ouvertures (448, 464, 477') et des rampes d'alimentation (434, 441, 455, 455', 471, 471') propres à guider des cartouches de chaque rouleau denté vers un étranglement d'alimentation (415) du boîtier.

10. Chargeur à tambour suivant la revendication 9, caractérisé en ce que la bande (447, 462) comporte un doigt (485, 486) adjacent à l'oreille mais orienté vers l'intérieur afin de traverser une ouverture (460, 475) dans l'élément tubulaire du rouleau denté (42, 43) auquel la bande est attachée, le doigt ayant une longueur et une position telles que, lorsque la bande est abaissée par des cartouches, elle est déplacée entre des cartouches se trouvant sur le rouleau denté intérieur adjacent afin de faire tourner le rouleau denté adjacent dans un sens à l'encontre de la force du moyen d'entraînement (46) de manière à supprimer ainsi la pression exercée sur les cartouches dans les rampes d'alimentation.

11. Chargeur à tambour suivant l'une quelconque des revendications 2 à 10, caractérisé en ce que chaque rouleau denté (42, 43, 44) est pourvu des dentelures (451) directement dans la périphérie externe de l'élément tubulaire (448, 464, 477').

12. Chargeur à tambour suivant la revendication 1, caractérisé en ce que les éléments montés à rotation sont disposés concentriquement dans le boîtier et l'élément extérieur comprend une plaque de base et des moyens de guidage de cartouches partant de la plaque de base et définissant des trajets en substance concentriques pour les cartouches et un pont reliant les trajets.

13. Chargeur à tambour suivant la revendication 12, caractérisé en ce que l'élément intérieur est un moyen d'entraînement qui comprend un rotor entraîné par ressort et un poussoir pivotant relié au rotor pour exercer une force destinée à pousser les cartouches le long des trajets.

14. Chargeur à tambour pour une arme à feu suivant la revendication 1, caractérisé en ce qu'un connecteur (447) est prévu et une partie de ce connecteur est attachée à un des éléments (43) intervenant pour faire passer l'entraînement d'une manière prédéterminée de l'un des éléments (43) à l'autre élément (42) de telle sorte que les éléments tournent ensemble, un déconnexion du connecteur permettant à un élément de tourner par rapport à l'autre élément.

15. Chargeur à tambour suivant la revendication 14, caractérisé en ce que les deux éléments (42, 43) sont à même de transporter des cartouches.

16. Chargeur à tambour suivant la revendication 15, caractérisé en ce que les éléments sont des rouleaux dentés (42, 43) présentant chacun une périphérie et plusieurs dentelures (451) dans lesquelles sont reçues plusieurs cartouches.

17. Chargeur à tamour suivant la revendication 16, caractérisé en ce que les rouleaux dentés comprennent au moins deux joues radiales circulaires (449, 450; 466, 467) espacées axialement le long d'un élément tubulaire (448; 464), chaque joue comportant une dentelure (451) dans le creux desquelles plusieurs cartouches sont placées entre les joues.

18. Chargeur à tambour suivant la revendication 2, caractérisé en ce que le boîtier (40) est un élément moulé en matière plastique qui a la forme d'une cuvette et qui comporte un couvercle (41) également en matière plastique moulée.

19. Chargeur à tambour suivant la revendication 18, caractérisé en ce qu'une voie en creux (430, 493, 494) est formée dand le boîtier et le couvercle pour positionner et guider les rouleaux dentés.

20. Chargeur à tambour suivant la revendication 2, caractérisé en ce que les rouleaux dentés (42, 43, 44) sont faits d'une matière plastique.

21. Chargeur à tambour pour une arme à feu suivant la revendication 2, caractérisé en ce que le boîtier (40) comporte une paroi périphérique (427) définissant un intérieur de section circulaire, un couvercle (41) pour le boîtier, un étranglement d'alimentation (415) qui s'étend à travers la paroi pour libérer des cartouches du boîtier, et au moins deux rouleaux dentés concentriques tournants, les rouleaux dentés comprenant chacun un élément tubulaire concentrique (448, 464, 477'), au moins deux joues radiales circulaires (449, 450, 466, 467, 477, 478) espacées le long de ces éléments, les joues comportant chacune une dentelure (451) pour recevoir plusieurs cartouches entre elles, une ouverture d'alimentation de cartouche (454, 470) dans chaque élément

tubulaire à l'exception de l'élément intérieur pour permettre aux cartouches de passer du rouleau denté intérieur à l'autre rouleau denté, des rampes d'alimentation (434, 441, 455, 455', 471, 471') propres à guider les cartouches à partir de chaque rouleau denté (42, 43, 44) vers l'étranglement d'alimentation (415) et un poussoir (47) monté sur le rouleau denté intérieur (44) qui est prévu pour pousser les cartouches restantes qui n'ont pas été poussées par les cartouches engagées dans les dentelures le long des rampes d'alimentation vers l'étranglement d'alimentation, le poussoir comprenant un élément un U (406) dont les extrémités libres sont montées sur un pivot (405) s'étendant entre les joues du rouleau denté intérieur (44), chaque aile du U étant adjacente à une joue associée (477, 478), et une barrette (407) située le long de la base de l'élément en U qui est engagée de la même manière que les cartouches sur les joues, la longueur des ailes de l'élément en U étant suffisante pour permettre à la deunière cartouche dans le chargeur d'être poussée par la barrette vers l'extrémité externe de l'étranglement d'alimentation (415).

22. Chargeur à tambour suivant la revendication 21, caractérisé par un dispositif d'actionnement d'arrêt par la dernière cartouche (48) comprenant un élément à ressort (414) placé près d'une aile du poussoir (47) pour se déplacer avec cette aile, l'élément à ressort étant ainsi étendu à l'extérieur du boîtier (40) lorsque la barrette de poussoir (407) est étendue vers l'extrémité externe de l'étranglement d'alimentation (415).

23. Chargeur à tambour suivant la revendication 22, caractérisé en ce que l'élément d'actionnement d'arrêt par la dernière cartouche est une lame de ressort (413) dont une extrémité est reliée au pivot (405) du poussoir et dont l'autre extrémité est reliée à un bouton (414), le bouton étant adjacent au couvercle (41), étant sollicité vers ce couvercle et faisant saillie à partir de ce dernier lorsque la barrette (407) est étendue dans l'étranglement d'alimentation (415).

24. Chargeur à tambour suivant la revendication 22, caractérisé en ce que le dispositif d'actionnement d'arrêt par la dernière cartouche est un plongeur (414') avec un ressort (413') logé dans la barrette du poussoir (407) et agencé de telle façon que le plongeur soit adjacent au couvercle et soit rappelé vers ce couvercle qu'il dépasse lorsque la barrette (407) est étendue dans l'étranglement d'alimentation (415).

25. Chargeur à tambour suivant la revendication 2, caractérisé en ce que les rouleaux dentés (42, 43, 44) sont entraînés par un ressort de torsion (46), un axe central (45) et une fente (403) étant prévus dans l'élément tubulaire (477') du rouleau denté intérieur (44), le ressort de torsion étant tendu entre eux.

26. Chargeur à tambour suivant la revendication 21, caractérisé en ce que des moyens d'arrêt (437, 457, 473) sont prévus pour limiter de manière séquentielle la rotation relative entre chaque rouleau denté (42, 43, 44) et le boîtier, ces moyens d'arrêt servant à aligner de manière séquentielle les rampes d'alimentation (434, 441, 455, 455', 471, 471') des rouleaux dentés tour à tour au départ du rouleau denté extérieur (42).

27. Chargeur à tambour pour une arme à feu comprenant un boîtier fixe (40), un élément intérieur monté à rotation (43) et un élément extérieur monté à rotation (42) en substance concentrique, un moyen d'entraînement (46) pour faire tourner les éléments dans un premier sens, des moyens d'arrêt (437, 458) pour limiter la rotation de l'élément extérieur par rapport au boîtier, caractérisé par des moyens de verrouillage (447, 489) entre l'élément extérieur (42) et le boîtier (40) propres à se bloquer lorsque les moyens d'arrêt (437, 458) limitent la rotation de l'élément extérieur (42) de manière à empêcher l'élément extérieur de tourner dans un sens opposé au premier jusqu'à ce que l'élément intérieur (43) ait été tourné dans ce sens contraire dans une mesure prédéterminée, les moyens de verrouillage comprenant un connecteur (447) dont une partie est attachée à un des éléments (43), par l'intermédiaire duquel la force d'entraînement peut passer d'une manière prédéterminée d'un des éléments (43) à l'autre élément (42) de sorte que les éléments tournent ensemble, la déconnexion du connecteur permettant à un élément de tourner par rapport à l'autre élément.

Patentansprüche

1. Trommelmagazin für eine Schußwaffe mit einem ortsfesten Gehäuse (40), einem inneren drehbar gelagerten Glied (43) und einem mit ihm im wesentlichen konzentrischen, äußeren drehbar gelagerten Glied (42), ferner mit einem Antrieb (46) zu Drehen der Glieder in einer ersten Richtung und einer Anschlageinrichtung (437, 458) zum Begrenzen der Drehung des äußeren Gliedes (42) gegenüber dem Gehäuse (40), gekennzeichnet durch eine zwischen dem äußeren Glied (42) und dem Gehäuse (40) angeordnete Rasteinrichtung (447, 489), die eine Sperrung bewirkt, wenn die Anschlageinrichtung (437, 458) die Drehung des äußeren Gliedes (42) begrenzt, und die dann eine Drehung des äußeren Gliedes (42) in der der ersten Richtung entgegengesetzten Richtung verhindert, bis das innere Glied (43) eine vorherbestimmte Drehbewegung in der genannten entgegengesetzten Richtung ausgeführt hat.

2. Trommelmagazin nach Anspruch 1, dadurch gekennzeichnet, daß jedes der genannten Glieder (42, 43) einem wesentlichen konzentrische Zahntrommel besitzt, die einen Rohrkörper (448, 464, 477') aufweist und an seinem Außenumfang mit mehreren Randausnehmungen (451) versehen ist, die mehrere Patronen aufnehmen können.

3. Trommelmagazin nach Anspruch 2, dadurch gekennzeichnet, daß mehr als zwei Zahntrommeln (42, 43, 44) vorgesehen sind und daß die Anschlageinrichtung Anschläge (437, 458, 459, 474) aufweist, die zum Angriff aneinander geeignet und zwischen einander benachbarten Zahntrommeln vorgesehen sind, außer zwischen der innersten Zahntrommel (44) und der ihr

benachbarten Zahntrommel (43).

4. Trommelmagazin nach Anspruch 3, dadurch gekennzeichnet, daß zwischen einander benachbarten Zahntrommeln, außer zwischen der innersten Zahntrommel (44) und der ihr benachbarten Zahntrommel (43), je eine weitere Rasteinrichtung (461, 462) vorgesehen ist, die einrastet, wenn die miteinander zusammenwirkenden Anschläge (437, 458, 459, 473) aneinander angreifen, und die dann die Drehung einer jeweils zugeordneten verrasteten Zahntrommel verhindert, bis deren Randausnehmungen mit Patronen gefüllt werden sollen.

5. Trommelmagazin nach Anspruch 4, dadurch gekennzeichnet, daß die zwischen dem Gehäuse und der äußersten Zahntrommel angeordnete Rasteinrichtung ein Bandstück (447) besitzt, das mit der äußersten Zahntrommel (42) schwenkbar verbunden und zu der Innenumfangswandung des Gehäuses hin federbelastet ist, und eine in der genannten Umfangswandung ausgebildete Vertiefung oder Ausnehmung (446), wobei das Bandstück einen Lappen (487) besitzt, der an der Lippe (489) der Vertiefung oder Ausnehmung angreift, wenn die dem Gehäuse und der äußersten Zahntrommel zugeordneten Anschläge (437, 458) aneinander angreifen.

6. Trommelmagazin nach Anspruch 5, dadurch gekennzeichnet, daß jede der weiteren Rasteinrichtungen zwischen einander benachbarten Zahntrommeln ein Bandstück (462) besitzt, das mit der der beiden benachbarten Zahntrommeln (43) schwenkbar verbunden und zu der Innenwandung des Rohrkörpers der benachbarten äußeren Zahntrommel (42) hin federbelastet ist, und eine in der genannten Innenwandung ausgebildete Vertiefung oder Ausnehmung (460), wobei das Bandstück der weiteren Rasteinrichtung einen Lappen (488) besitzt, der an einer Lippe (461) der Vertiefung oder Ausnehmung in der genannten Innenwandung angreift, wenn die den benachbarten Zahntrommeln zugeordneten Anschläge (459, 474) aneinanderliegen.

7. Trommelmagazin nach Anspruch 5 oder 6, dadurch gekennzeichnet, daß das Bandstück (447, 462) auf der dem Lappen (487, 488) entgegengesetzten Seite der zugeordneten Schwenkachse einen Zapfen (483, 484) besitzt, der den Rohrkörper Zahntrommel, an der das Bandstück angebracht ist, durchsetzt und sich zu der inneren benachbarten Zahntrommel hin erstreckt, wobei der Zapfen so lang ist, daß er von einer Patrone auf der benachbarten inneren Zahntrommel berührt und daher das Bandstück derart gedreht wird, daß der Lappen des Bandes von der zugeordneten Lippe abrückt und eine Drehung der Zahntrommel gestattet, an der das Bandstück angebracht ist.

8. Trommelmagazin nach Anspruch 7, dadurch gekennzeichnet, daß das Bandstück (447, 462) im Mantel des Rohrkörpers jener Zahntrommel (42, 43) angeordnet ist, an der das Bandstück angebracht ist, und daß das Bandstück von auf der genannten Zahntrommel vorgesehenen Patronen in dem Rohrkörper eindrückbar ist.

9. Trommelmagazin nach einem der Ansprüche 2 bis 8, dadurch gekennzeichnet, daß jede Zahntrommel (42, 43, 44) den Rohrkörper (448, 464, 477') mit mindestens zwei kreisförmigen Radialflanschen (449, 450, 466, 467, 477, 478) besitzt, die in Abständen voneinander längs des Rohrkörpers angeordnet sind und von denen jeder mit Randausnehmungen (451) aus gebildet ist, in denen mehrere Patronen zwischen den Flanschen aufgenommen werden können, wobei der Abstand der Randausnehmungen der innersten Zahntrommel (44) von der Innenwandung der nächstäußeren Zahntrommel (43) im wesentlichen ebensogroß ist wie der Abstand der Randausnehmungen der äußersten Zahntrommel (42) von der Innenumfangswandung (427) des Gehäuses, wobei in jedem Rohrkörper mit Ausnahme des innersten ein Patronendurchlaß (454, 470) vorgesehen ist, so daß Patronen durch die mit dem Durchlaß ausgebildeten Rohrkörper (448, 464, 477') hindurchtreten können, und Zuführungsrampen (434, 441, 455, 455', 471, 471') vorgesehen sind, die dazu dienen, Patronen von jeder der Zahntrommeln zu einem verengten Zuführungskanal (415) des Gehäuses zu führen.

10. Trommelmagazin nach Anspruch 9, dadurch gekennzeichnet, daß das Bandstück (447, 462) im Bereich des Lappens einen Finger (485, 486) besitzt, der sich einwärts durch eine Ausnehmung (460, 475) des Rohrkörpers jener Zahntrommel (42, 43) erstreckt, an der das Bandstück angebracht ist, und der eine solche Länge hat und so angeordnet ist, daß das von Patronen heruntergedrückte Bandstück zwischen Patronen auf der benachbarten inneren Zahntrommel derart verschoben wird, daß es diese benachbarte Zahntrommel gegen die Kraft des Antriebes (46) in einer solchen Richtung dreht, daß die Patronen in den Zuführungsrampen druckentlastet werden.

11. Trommelmagazin nach einem der Ansprüche 2 bis 10, dadurch gekennzeichnet, daß in jeder Zahntrommel (42, 43, 44) die Randausnehmungen (451) direkt im Außenumfang des Rohrkörpers (448, 464, 477') vorgehesen sind.

12. Trommelmagazin nach Anspruch 1, dadurch gekennzeichnet, daß die drehbar gelagerten Glieder in dem Gehäuse konzentrisch angeordnet sind und das äußerste Glied eine Grundplatte aufweist sowie Patronenführungsschienen, die sich von der Grundplatte erstrecken und im wesentlichen konzentrische Patronenbahnen definieren, und eine diese Bahnen verbindende Brücke.

13. Trommelmagazin nach Anspruch 12, dadurch gekennzeichnet, daß das innere Glied ein Antriebselement ist, das einen federgetriebenen Rotor besitzt, sowie einen schwenkbar gelagerten Stößel, der mit dem Rotor verbunden und geeignet ist, derart eine Kraft auszuüben, daß die Patronen längs der Bahnen geschoben werden.

14. Trommelmagazin für eine Schußwaffe nach Anspruch 1, dadurch gekennzeichnet, daß ein Verbinder (447) vorgesehen ist, der einen an einem der Glieder (43) angebrachten Teil besitzt, über den ein Antrieb in vorherbestimmter Weise

von einem der Glieder (43) auf das andere der Glieder (42) derart übertragbar ist, daß die Glieder gemeinsam rotieren, und daß bei gelöstem Verbinder ein Glied gegenüber dem anderen drehbar ist.

15. Trommelmagazin nach Anspruch 14, dadurch gekennzeichnet, daß beide Glieder (42, 43) zu Tragen von Patronen geeignet sind.

16. Trommelmagazin nach Anspruch 15, dadurch gekennzeichnet, daß die Glieder Zahntrommeln (42, 43) sind, von denen jede in ihrem Außenumfang mehrere Randausnehmungen (451) besitzt, die mehrere Patronen aufnehmen können.

17. Trommelmagazin nach Anspruch 16, dadurch gekennzeichnet, daß die Zahntrommeln mindestens zwei kreisförmige Radialflansche (449, 450; 466, 467) besitzen, die längs eines Rohrkörpers (448; 464) im Axialabstand voneinander angeordnet sind und von denen jeder mit Randausnehmungen (451) zur Aufnahme mehrere Patronen zwischen den Flanschen ausgebildet ist.

18. Trommelmagazin nach Anspruch 2, dadurch gekennzeichnet, daß das Gehäuse (40) ein topfförmiges Formpreßteil aus Kunststoff und mit einem ebenfalls aus Kunststoff formgepreßtem Deckel (41) versehen ist.

19. Trommelmagazin nach Anspruch 18, dadurch gekennzeichnet, daß in dem Gehäuse und dem Deckel eine vertieft angeordnete Führung (430, 493, 494) zum Festlegen und Führen der Zahntrommeln ausgebildet ist.

20. Trommelmagazin nach Anspruch 2, dadurch gekennzeichnet, daß die Zahntrommeln (42, 43, 44) aus Kunststoff bestehen.

21. Trommelmagazin nach Anspruch 2, dadurch gekennzeichnet, daß das Gehäuse (40) einen Mantel (427) besitzt, der einen im Querschnitt kreisförmigen Innenraum begrenzt, der einen im Querschnitt kreisförmigen Innenraum begrenzt, ferner einen Deckel (41), einen Austrittskanal (415), der den genannten Mantel durchsetzt und zur Abgabe von Patronen aus dem Gehäuse dient, und mindestens zwei drehbare konzentrische Zahntrommeln, die je einen konzentrischen Rohrkörper (448, 464, 477') und mindestens zwei kreisförmige Radialflansche (449, 450, 466, 467, 477, 478) besitzen, die im Abstand voneinander längs des Rohrkörpers angeordnet sind und von denen jeder mit Randausnehmungen (451) zur Aufnahme mehrere Patronen ausgebildet ist, wobei in jedem Rohrkörper mit Ausnahme des innersten ein Patronendurchlaß (454, 470) ausgebildet ist, durch den hindurch Patronen von der inneren Zahntrommel zu den anderen Zahntrommeln gelangen können, Zuführungsrampen (434, 441, 455, 455', 471, 471') zum Führen von Patronen von jeder der Zahntrommeln (42, 43, 44) zu dem Austrittskanal (415), und einen auf der innersten Zahntrommel (44) montierten Stößel (47), der geeignet ist, jene verbleibenden Patronen vorzuschieben, die nicht von in den Randausnehmungen angeordneten Patronen längs der Vorschubrampen zu dem Zuführungskanal geschoben worden sind, wobei der Stößel ein U-förmiges Glied (406) besitzt, das an seinen freien Enden auf einer Schwenkachse (405) montiert ist, die sich zwischen den Flanschen der innersten Zahntrommel (44) erstreckt, jeder Schenkel des U-förmigen Gliedes einem zugeordneten Flansch (477, 478) benachbart ist, sich längs des Steges des U-förmigen Gliedes eine Stange (407) erstreckt, die ähnlich wie die Patronen von den Flanschen aufgenommen wird, und die Schenkel des U-förmigen Gliedes so lang sind, daß die Stange die letzte Patrone in dem Magazin zum äußeren Ende des Austrittskanals (415) vorschieben kann.

22. Trommelmagazin nach Anspruch 21, gekennzeichnet durch ein Betätigungselement (48) für eine nach dem letzten Schuß wirksame Sperre, mit einem federbelasteten Glied (414), das im Bereich eines Schenkels des Stößels (47) angeordnet und mit diesem Schenkel bewegbar ist, so daß das federbelastete Glied aus dem Gehäuse (40) ausgefahren wird, wenn die Schubstange (407) zu dem äußeren Rande des Zuführungskanals (415) hin ausgefahren wird.

23. Trommelmagazin nach Anspruch 22, dadurch gekennzeichnet, daß das Betätigungselement für die nach dem letzten Schuß wirksame Sperre eine Blattfeder (413) ist, die am einen Ende mit der Schwenkachse (405) des Stößels und am anderen Ende mit einem Knopf (414) verbunden ist, der im Bereich des Deckels (41) angeordnet und zu ihm hin federbelastet ist und von dem Deckel vorsteht, wenn die Stange (407) in den Austrittskanal (415) ausgefahren ist.

24. Trommelmagazin nach Anspruch 22, dadurch gekennzeichnet, daß das Betätigungselement für die nach dem letzten Schuß wirksame Sperre eine in der Stange des Stößels vorgesehene Anordnung mit einem Kolben (414') und einer Feder (413') ist, wobei der Kolben dem Deckel benachbart und zu ihm hin federbelastet ist und von ihm vorsteht, wenn die Stange (407) in den Austrittskanal (415) ausgefahren ist.

25. Trommelmagazin nach Anspruch 2, dadurch gekennzeichnet, daß die Zahntrommeln (42, 43, 44) von einer Torsionsfeder (46) angetrieben werden und daß in dem Rohrkörper (477') der innersten Zahntrommel (44) eine zentrale Achse (45) angeordnet und ein Langloch (403) ausgebildet ist, zwischen denen die Torsionsfeder unter Zugvorspannung angeordnet ist.

26. Trommelmagazin nach Anspruch 21, dadurch gekennzeichnet, daß Anschläge (437, 457, 473) vorgesehen sind, die nacheinander die Drehbewegung je einer der Zahntrommeln (42, 43, 44) gegenüber dem Gehäuse (40) begrenzen und dazu dienen, die Zuführungsrampen (434, 441, 455, 455', 471, 471') der Zahntrommeln nacheinander, mit der äußeren Zahntrommel (42) beginnend, auszurichten.

27. Trommelmagazin für eine Schußwaffe mit einem ortsfesten Gehäuse (40), einem inneren drehbar gelagerten Glied (43) und einem mit ihm im wesentlichen konzentrischen, äußeren drehbar gelagerten Glied (42), ferner mit einem Antrieb (46) zum Drehen der Glieder in einer ersten

Richtung und einer Anschlageinrichtung (437, 458) zum Begrenzen der Drehung des äußeren Gliedes (42) gegenüber dem Gehäuse (40), gekennzeichnet durch eine zwischen dem äußeren Glied (42) und dem Gehäuse (40) angeordnete Rasteinrichtung (447, 489), die eine Sperrung bewirkt, wenn die Anschlageinrichtung (437, 458) die Drehung des äußeren Gliedes (42) begrenzt, und die dann eine Drehung des äußeren Gliedes (42) in der der ersten Richtung entgegengesetzten Richtung verhindert, bis das innere Glied (43) eine vorherbestimmte Drehbewegung in der genannten entgegengesetzten Richtung ausgeführt hat, wobei die Rasteinrichtung einen Verbinder (447) besitzt, der einen an einem der Glieder (43) angebrachten Teil besitzt, über den ein Antrieb in vorherbestimmter Weise von einem der Glieder (43) auf das andere der Glieder (42) derart übertragbar ist, daß die Glieder gemeinsam rotieren, und daß bei gelöstem Verbinder ein Glied gegenüber dem anderen drehbar ist.

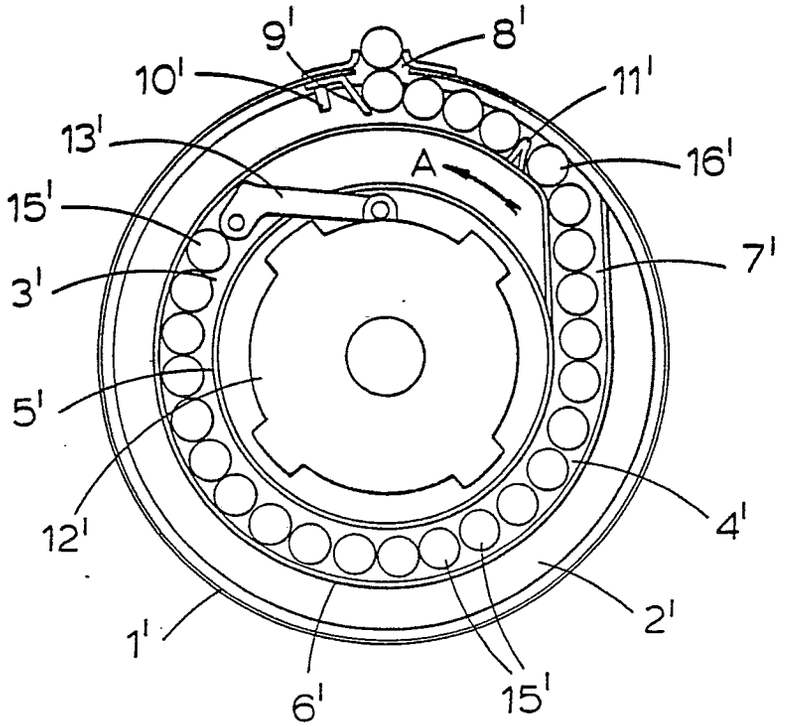

Fig.1

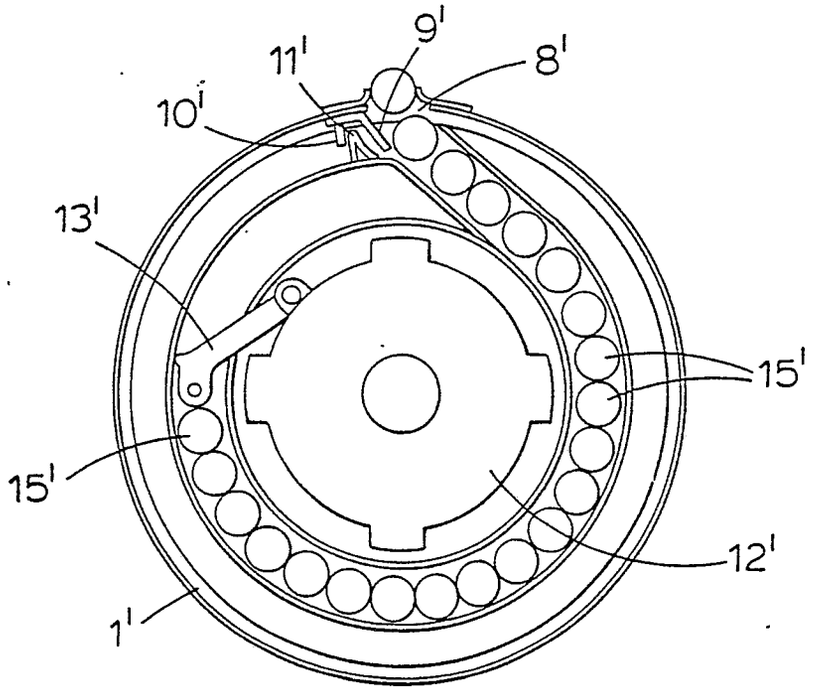

Fig.2

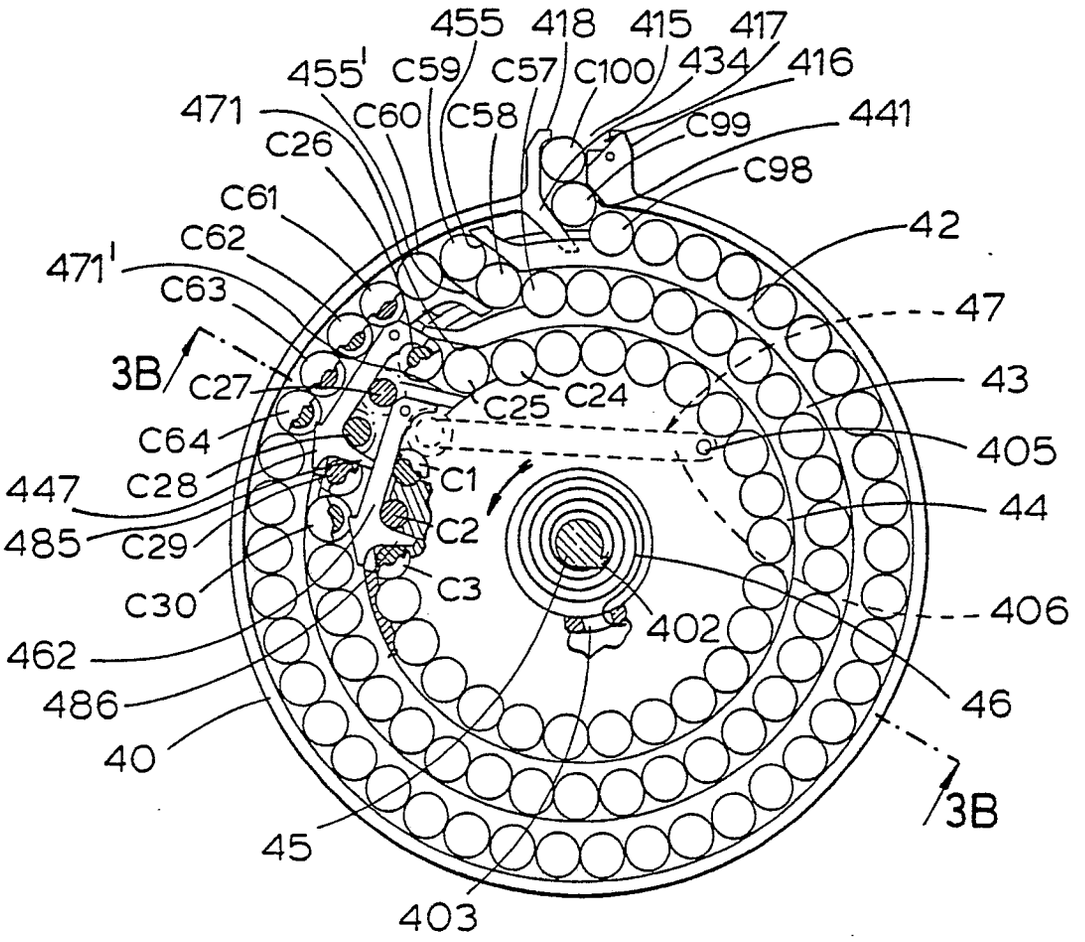

Fig.3A

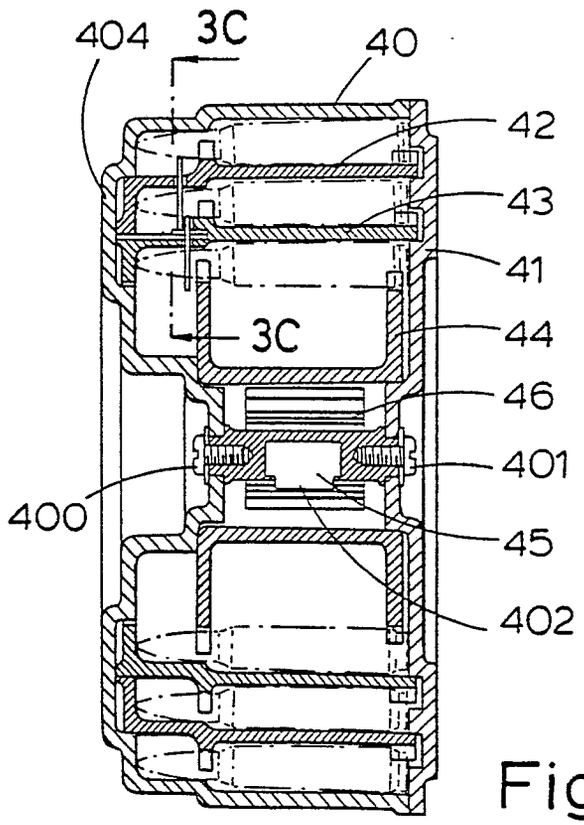

Fig.3B

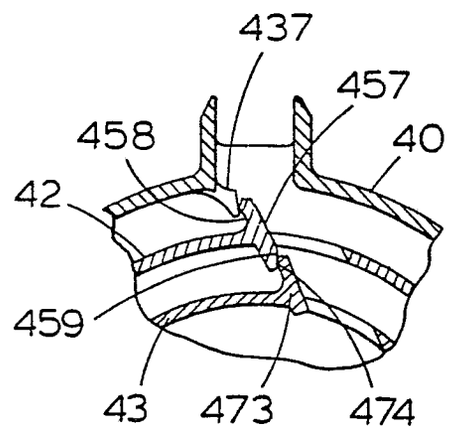

Fig.3C

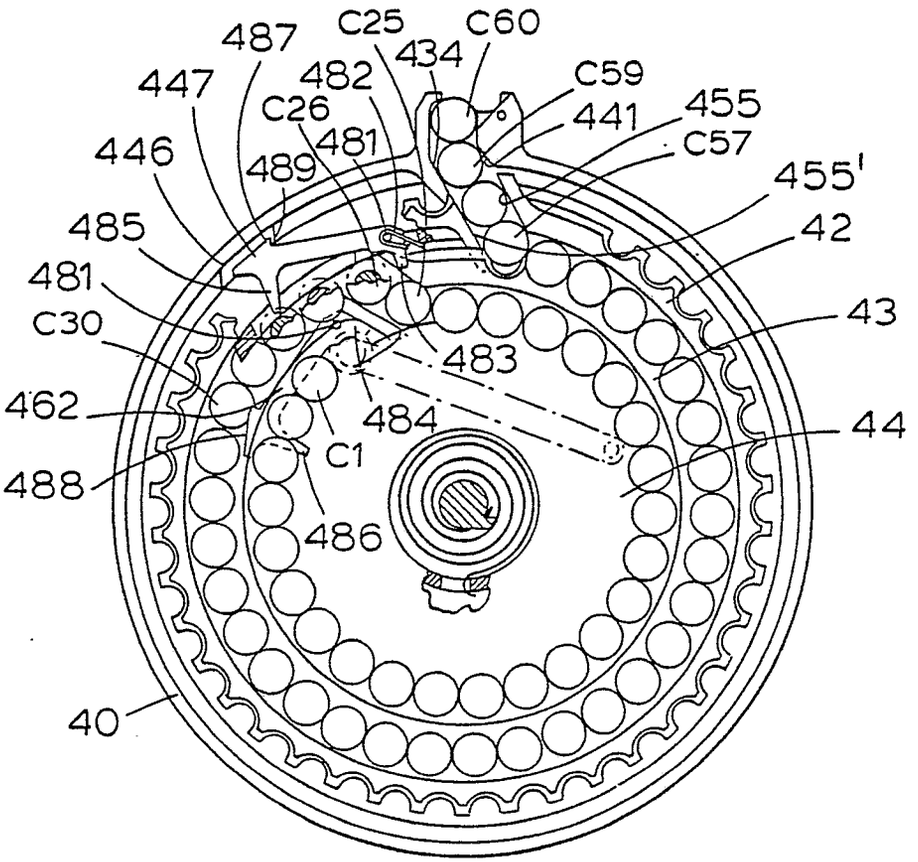

Fig.4

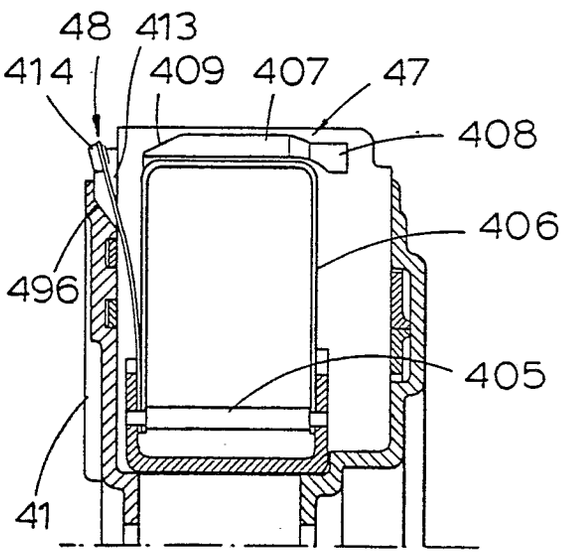

Fig.7B

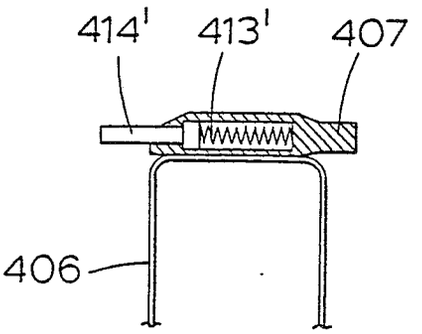

Fig.13

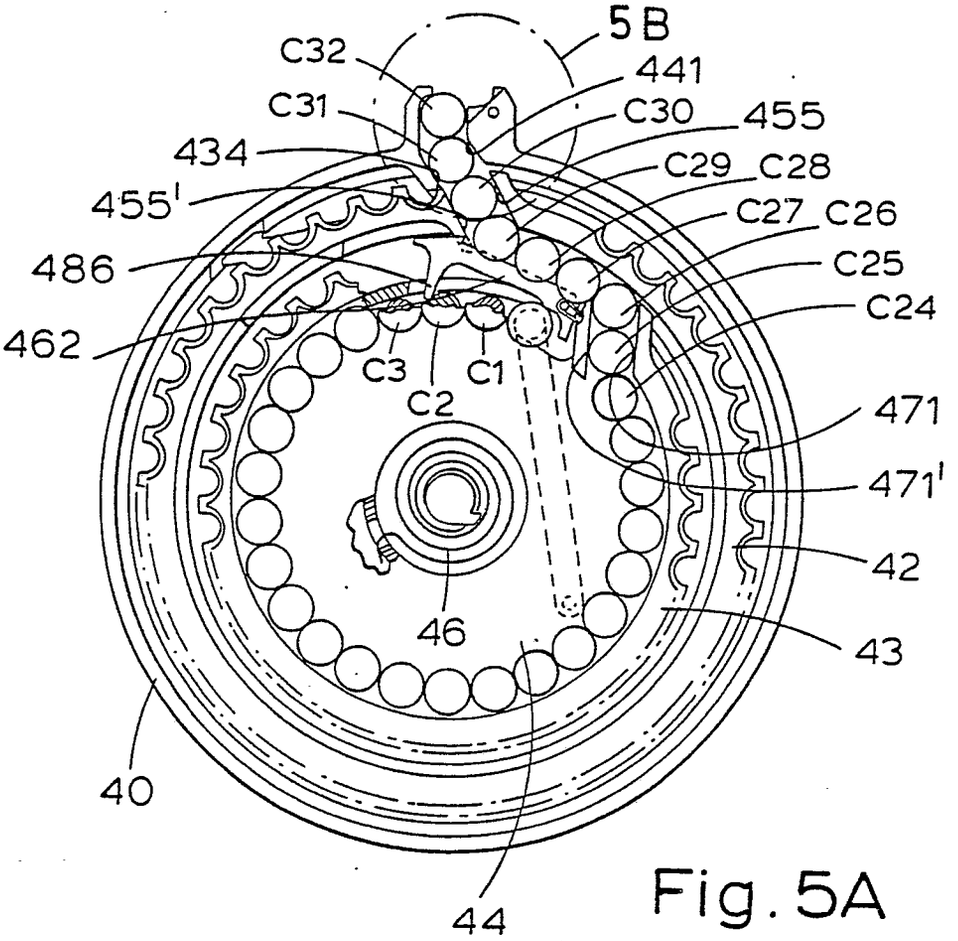
5B
C32
441
C31
C30
455
434
C29
C28
455'
C27
C26
486
C25
C24
462
C3
C1
C2
471
471'
42
46
43
40
44

Fig. 5A

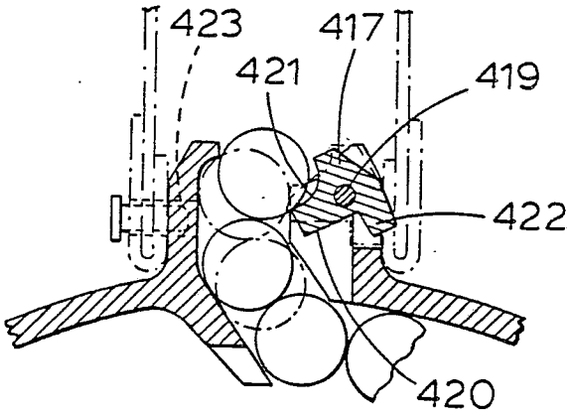
423
417
421
419
422
420

Fig. 5B

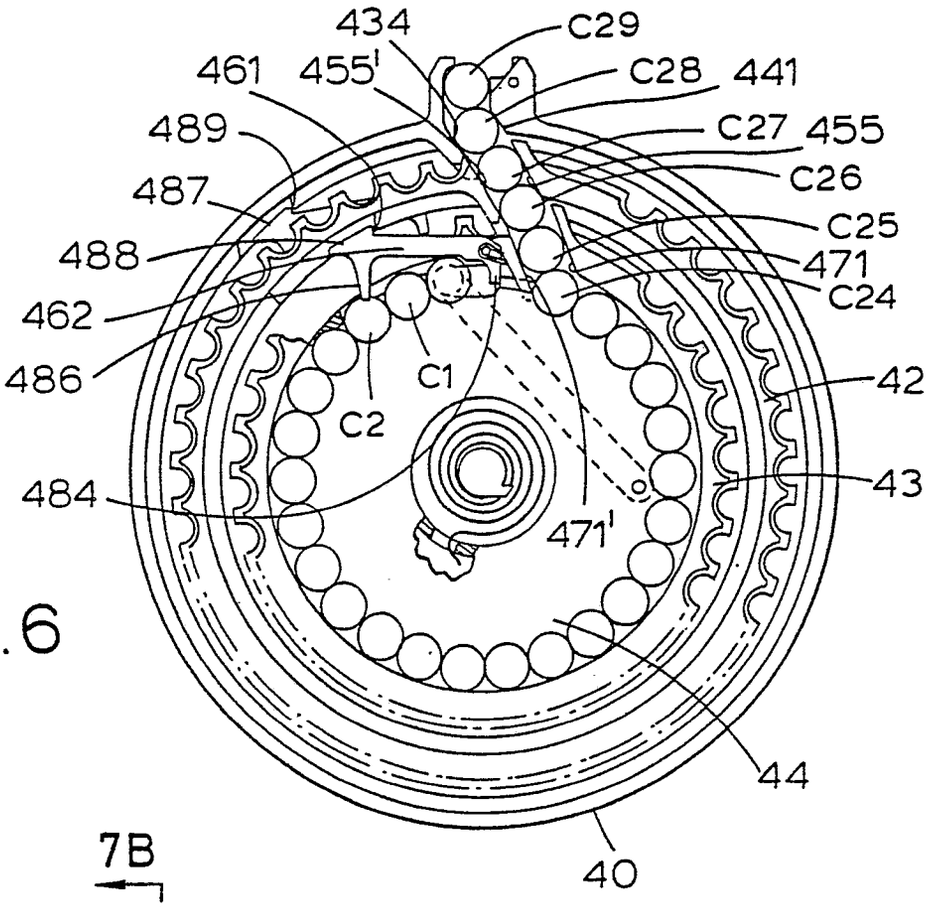
434
C29
461
455'
C28
441
489
C27
455
487
C26
C25
488
471
C24
462
C1
486
42
C2
43
484
471'
44
40

Fig.6

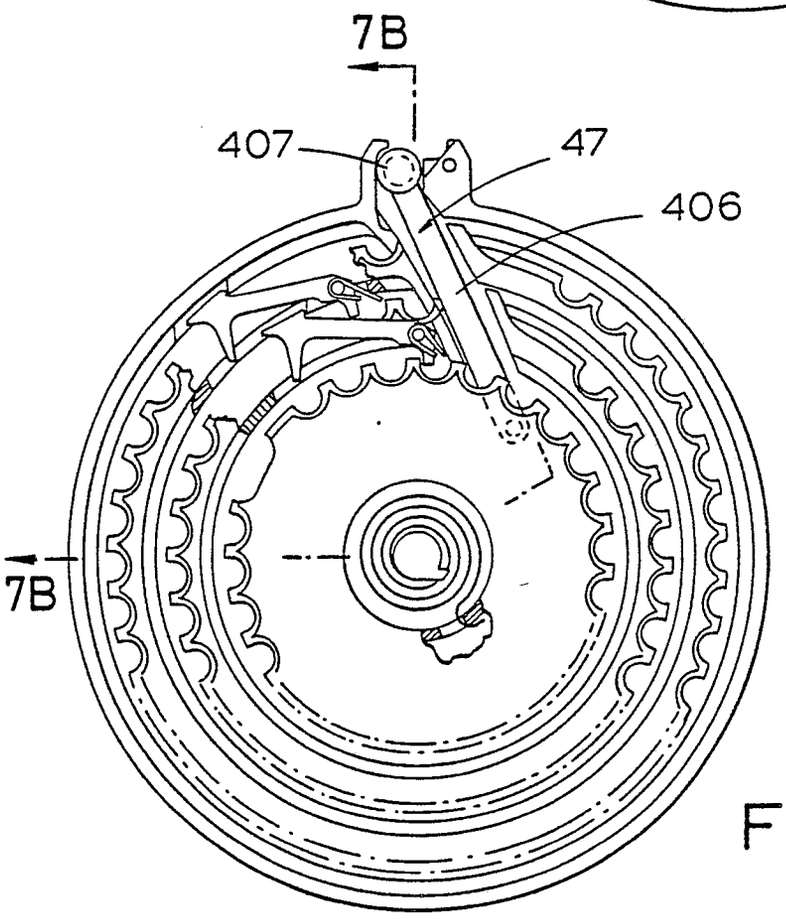
7B
407
47
406
7B

Fig.7A

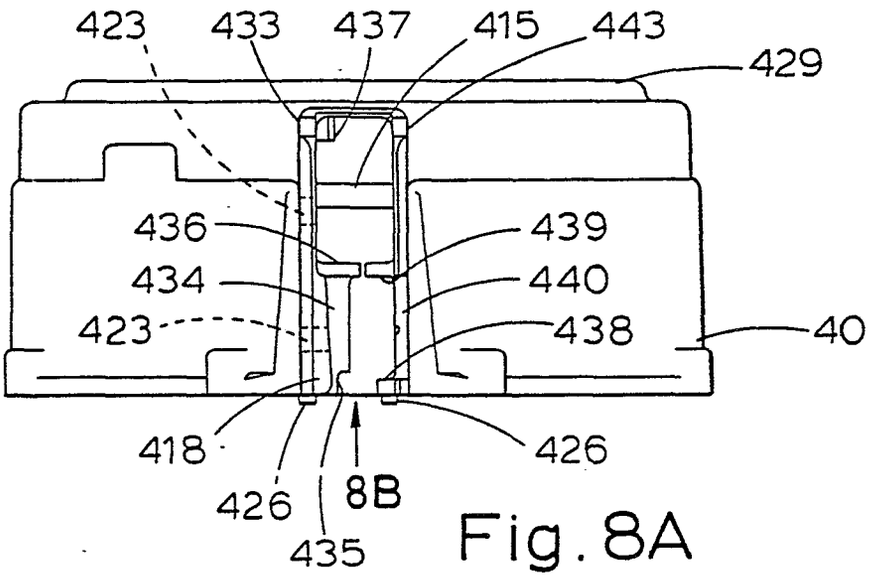
423
433
437
415
443
429
436
439
434
440
423
438
40
418
426
426
8B
435

Fig. 8A

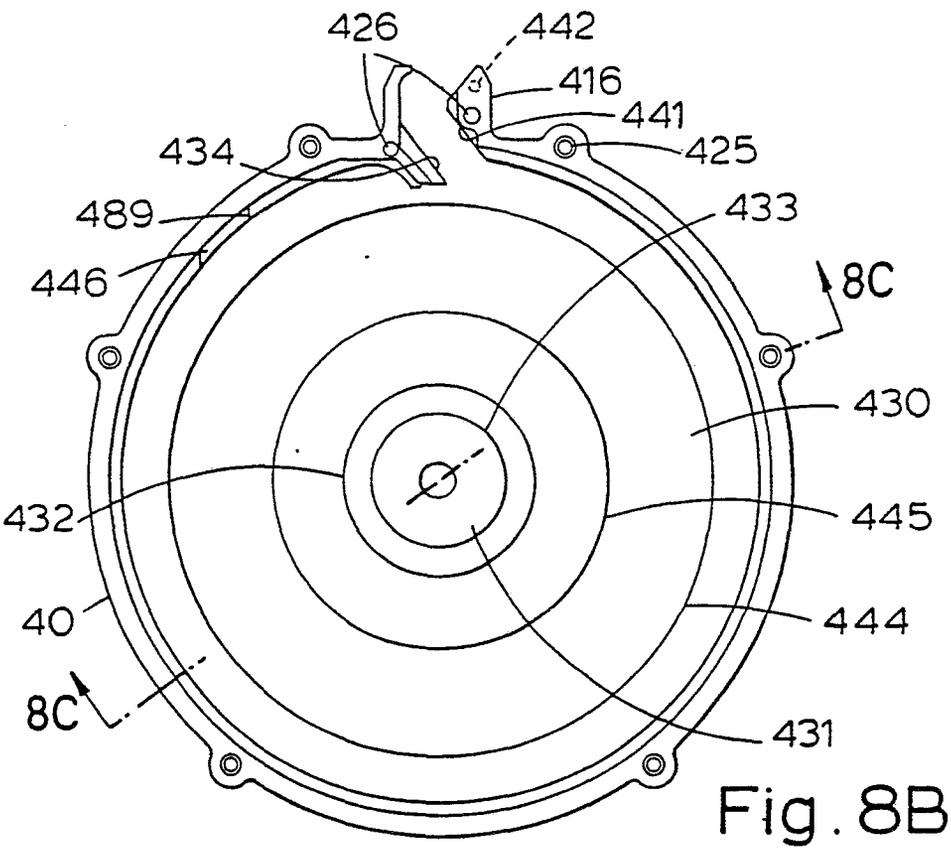
426
442
416
441
434
425
489
433
446
8C
430
432
445
40
444
8C
431

Fig. 8B

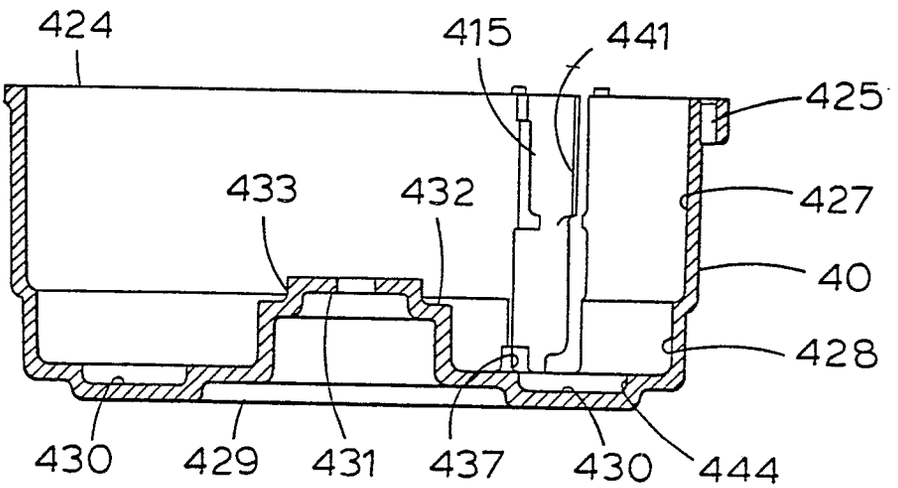

Fig. 8C

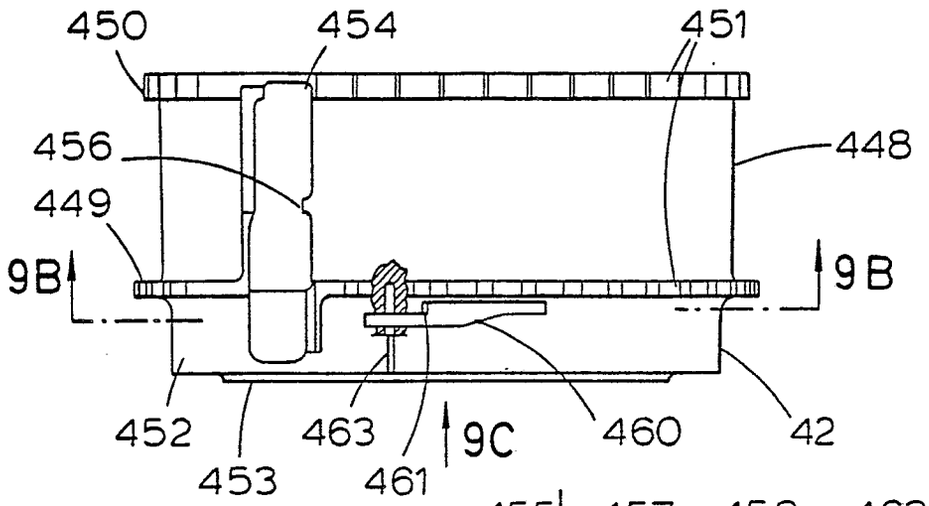

Fig.9A

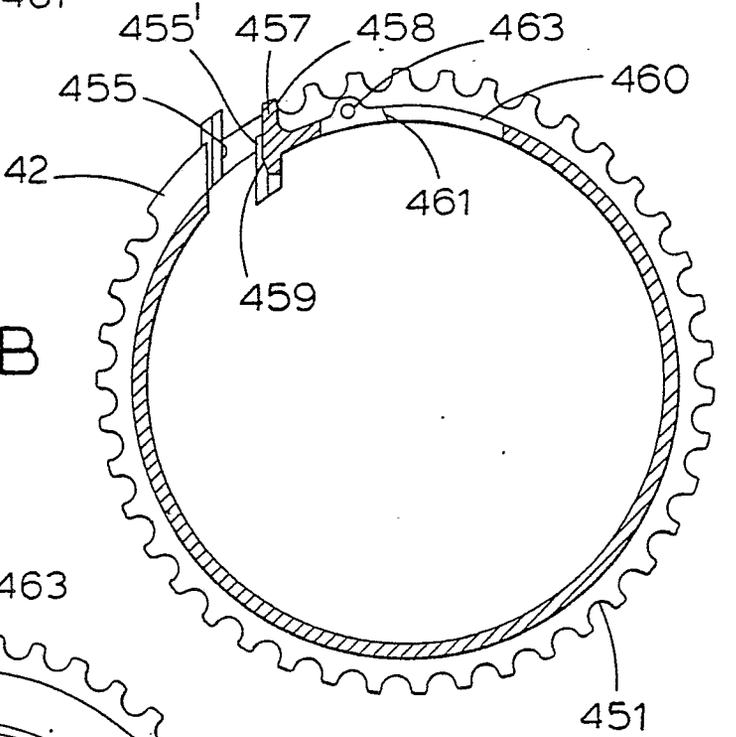

Fig.9B

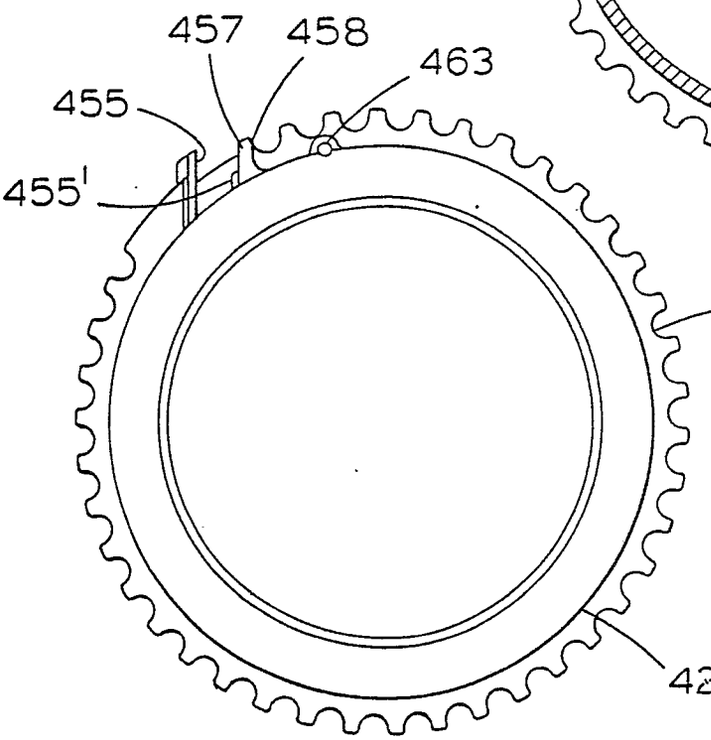

Fig.9C

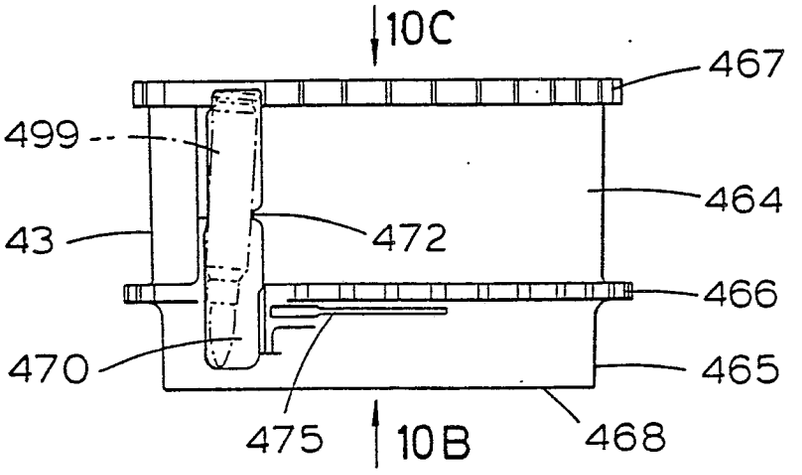

Fig.10A

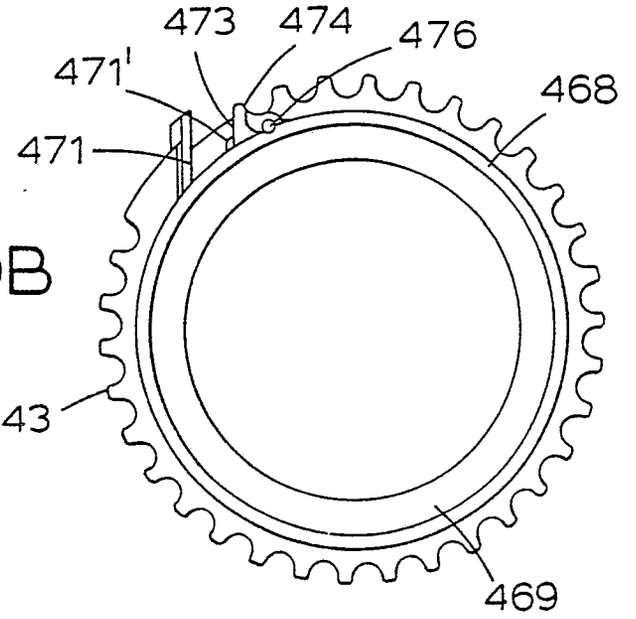

Fig.10B

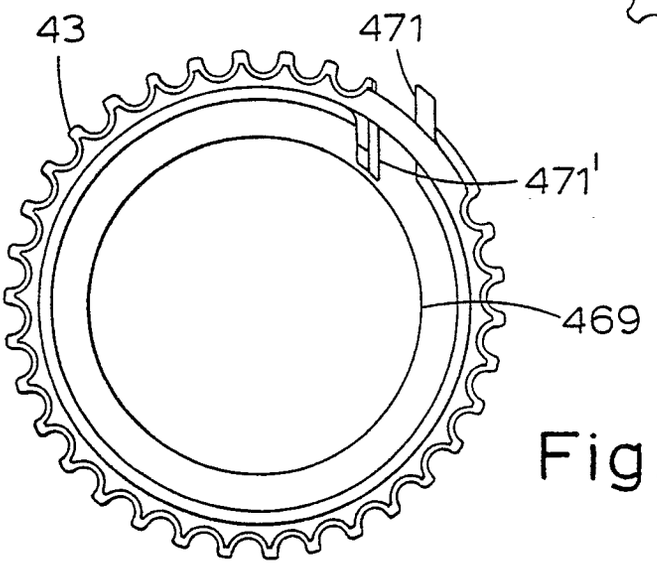

Fig.10C

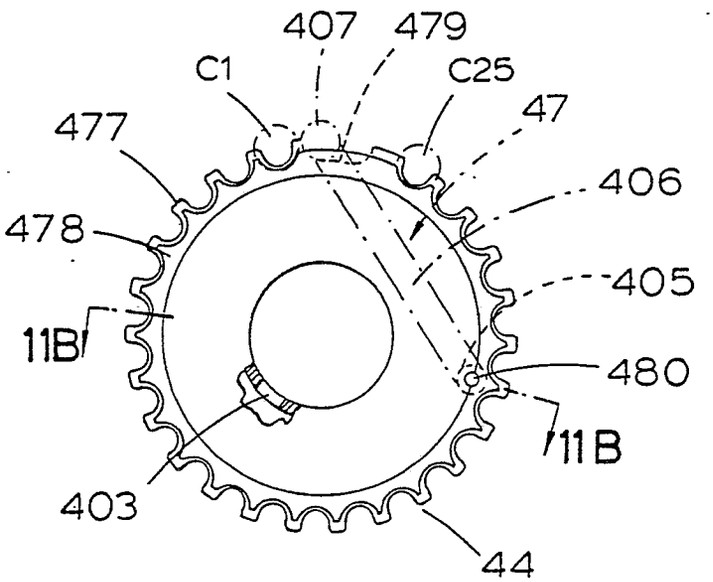

Fig.11A

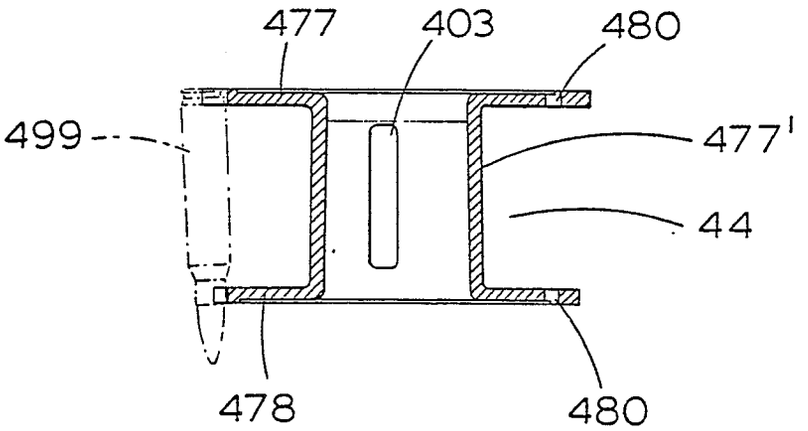

Fig.11B

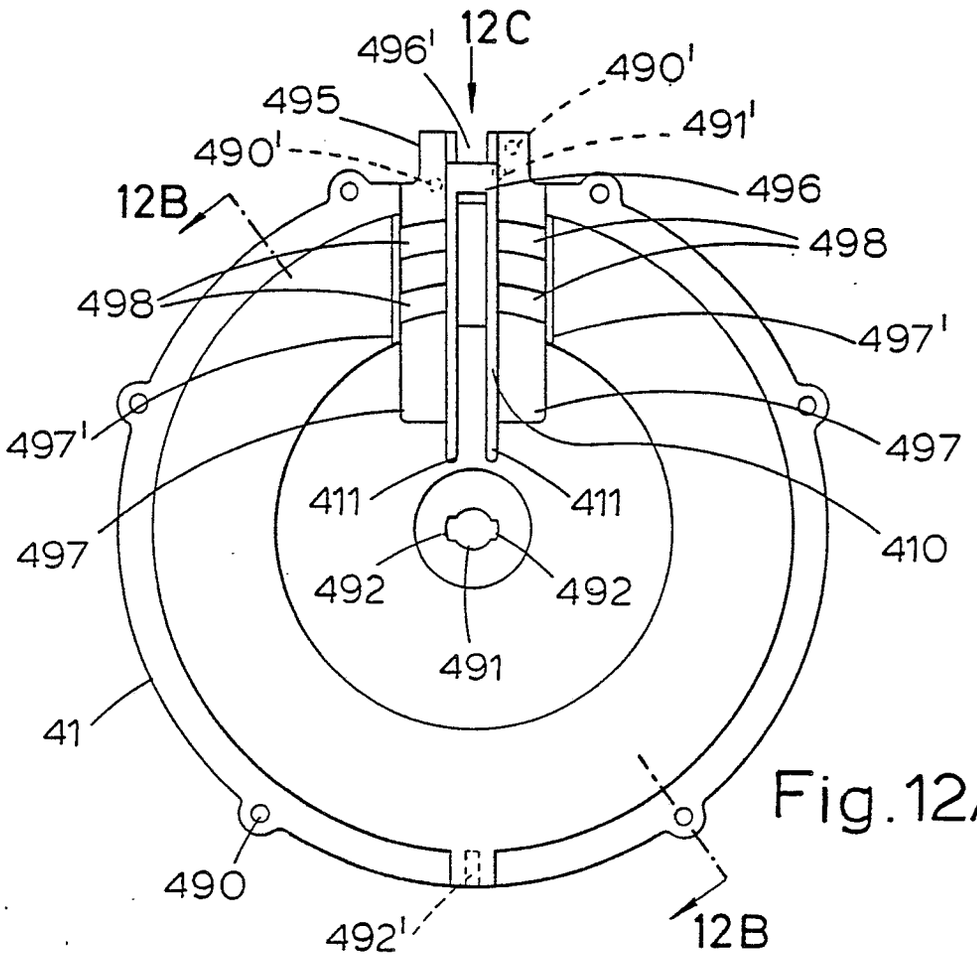

Fig.12A

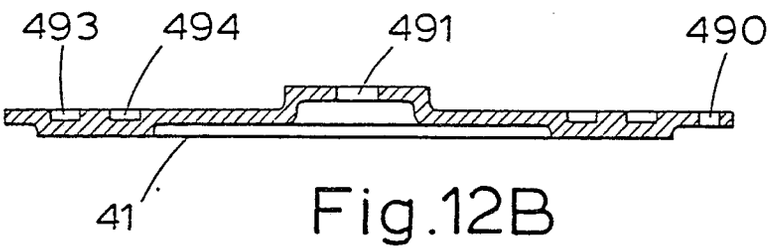

Fig.12B

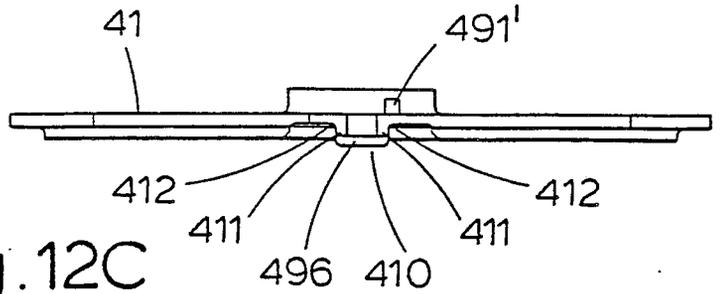

Fig.12C