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(54) **COMPENSATING WEFT BRAKE DEVICE FOR TEXTILE APPLICATIONS**

(57) A compensating weft broke device for textile applications, which comprises a body (30) that supports a first yarn-guide ring (50), and two articulated arms (32, 34) are kept elastically tensed in a widened configuration and support respective rows of second yarn-guide rings (52, 54); the first yarn-guide ring (50) and the second yarn-guide rings (52, 54) are retained in corresponding contoured seats (56, 58) of the body (30) and of the articulated arms (32, 34) by way of snap-action engagement means (50c, 30t, 52c, 52d, 58t1, 58t2).

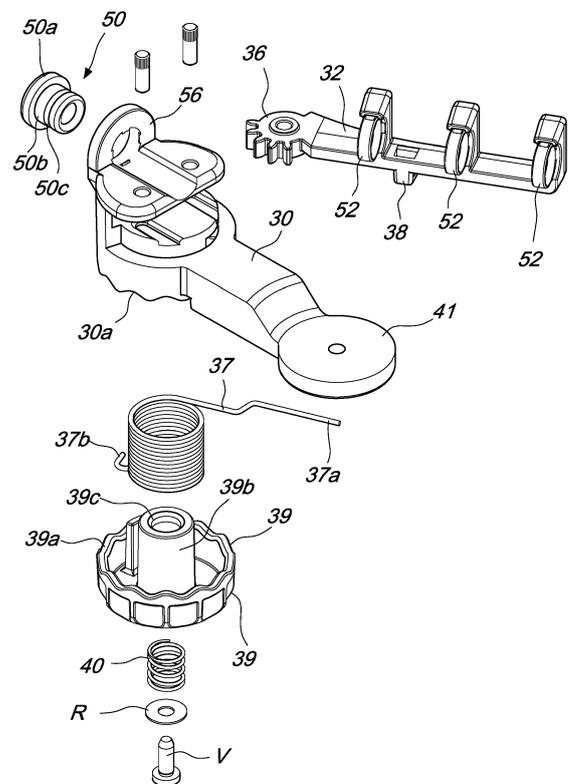


Fig. 5

Description

[0001] The present invention relates to a compensating weft brake device for textile applications.

[0002] As is known, in textile processing the yarn can be taken from a distaff and sent to a textile machine downstream by way of a weft feeder of the "positive" type, i.e. provided with a motorized weft-winding drum that actively pays out the yarn.

[0003] Between the distaff and the weft feeder, a compensating weft brake device can be interposed, the function of which is to dampen and compensate the variations in tension on the yarn while it is being unwound from the distaff.

[0004] A compensating weft brake device of this type is described in European patent no. EP1101851B1 by this same Applicant. It comprises a fixed body provided with two articulated arms that are coupled kinematically by way of gear sectors and are pushed toward a splayed configuration by a spring. The arms bear respective rows of yarn-guide rings in staggered positions, which are passed through alternately by the yarn with a zigzag path.

[0005] During the pickup of the yarn from the distaff, the arms react to peaks of tension by moving closer together in contrast with the elastic force of the spring, so as to provide the desired damping and compensating action.

[0006] In the embodiments described in EP1101851B1, the yarn-guide rings, which are typically ceramic, are retained in respective semicircular seats provided on the arms either by elastic straps, or by locking pins, or by contoured locking elements that can be fixed to the arms and which are provided with semicircular counter-seats that are adapted to define, together with the semicircular seats on the arms, closed circular receptacles.

[0007] The above mentioned fixing systems, while functional, entail the use of additional locking elements (elastic straps, pins, contoured locking elements) which, in addition to complicating the structure of the device, can be subject to deterioration (this is especially true for elastic straps) and/or they can weigh down the arms (this is especially true for contoured locking elements), increasing their inertia and consequently reducing the device's capacity to react.

[0008] The aim of the present invention is therefore to improve the compensating weft brake devices of the type described above by providing a system for fixing the yarn-guide rings that is more practical and more reliable, but without compromising its simplicity and lightness.

[0009] The above aim and other advantages, which will become clearer from the description that follows, are achieved by the compensating weft brake device having the characteristics claimed in the appended claim 1, while the appended dependent claims define other characteristics of the invention which are advantageous, although secondary.

[0010] Now the invention will be described in greater

detail, with reference to a preferred but not exclusive embodiment thereof, which is illustrated for the purposes of non-limiting example in the accompanying drawings, wherein:

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Figure 1 is a perspective view of two stacked weft feeders with which two respective compensating weft brake devices according to the invention are associated;

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Figure 2 is a view similar to Figure 1, in which one of the compensating weft brake devices is shown partially exploded;

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Figure 3 is a perspective view showing one of the compensating weft brake devices of Figure 1, on its own and at a greater scale;

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Figure 4 is another perspective view from a different angle of the compensating weft brake device in Figure 3;

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Figure 5 is an exploded perspective view of the compensating weft brake device according to the invention;

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Figure 6 is an enlarged-scale detail of Figure 5;

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Figure 7 is a perspective view of some partially assembled components of the compensating weft brake device according to the invention on their own; Figure 8 is a partially cross-sectional side view of the components in Figure 7 in an assembled configuration;

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Figure 9 is an enlarged-scale detail of Figure 8;

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Figure 10 is a cross-sectional view of Figure 9 taken along the line X-X.

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[0011] With initial reference to Figures 1 and 2, an assembly for supplying yarn comprises two identical weft feeders 10 which, in a way that is per se known, are interconnected mechanically and electronically in a stacked configuration.

[0012] Each one of the weft feeders 10 comprises a receptacle 12 that supports a motorized yarn winding spool 14 that has a lightened aerodynamic structure. The yarn winding spool 14 is functionally arranged between a yarn-guiding entry bush 16 and a yarn-guiding exit bush 18, both fixed to the receptacle 12.

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[0013] In each one of the feeders 10, the yarn passes through the yarn-guiding entry bush 16, is wound repeatedly (for example, three or four windings) between the yarn winding spool 14 and an oblique spacer pin 20 that is adapted to maintain the yarn loops axially spaced apart from each other, then passes through a tension sensor 22 that is adapted to monitor the output yarn tension for control purposes, and finally passes through the yarn-guiding exit bush 18 in order to be paid out to the downstream machine.

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[0014] In a per se conventional manner, each one of the feeders 10 takes yarn from a respective distaff, not shown.

[0015] Two respective identical compensating weft brake devices 24 are arranged upstream of the two feed-

ers 10, and are adapted to dampen and compensate the peaks of tension that may be generated on the yarn in the portion comprised between the distaff and the respective feeder 10. Both compensating weft brake devices 24 are mounted on a bracket 26 that is fixed to a support 28, on which the stack of feeders is hung.

[0016] With particular reference to Figures 3 and 5, in a way that is per se known, each one of the compensating weft brake devices 24 comprises a body 30 that is provided with two articulated arms 32, 34 which are coupled kinematically by way of gear sectors, e.g. 36. The arms 32, 34 are kept tensed in a splayed configuration by a torsion spring 37.

[0017] The spring 37 has one end 37a anchored to a seat 38 which is provided on one of the arms, the arm 32 in the example described herein. The opposite end 37b of the spring 37 is coupled to a knob 39, which is pivoted to the body 30 by way of a screw V with a washer R. The knob 39 is provided, at the base, with an undulating annular edge 39a which is pushed in axial engagement against a corresponding undulating annular abutment 30a of the body 30 by a small spring 40. The small spring 40 is accommodated in an axial cylindrical seat 39b of the knob 39, and is functionally interposed between the washer R and the bottom 39c of the axial cylindrical seat 39b.

[0018] The knob 39 can be made to rotate by click-stops, defeating the elastic force of the small spring 40, between several angular positions determined by the engagement between the undulating annular edges, so as to adjust the elastic force that maintains the arms 32, 34 in a widened position.

[0019] The body 30 has an elongated shape and ends with a disk-like anchoring end 41, by way of which it is fixed to a base 42 which is screwed on the bracket 26.

[0020] The base 42 comprises a detachable portion 42a which is provided with a cylindrical seat 44. The cylindrical seat 44 receives a cylindrical insert 46 made of plastic material to which the disk-like anchoring end 41 of the body 30 is coaxially screwed. The detachable portion 42a is detachably coupled to a fixed portion 42b of the base 42, which is screwed on the bracket 26. The fixed portion 42b supports an output yarn-guiding bush 48.

[0021] With particular reference now to Figures 3 and 4, the compensating weft brake device 24 is provided with a first yarn-guide ring 50 mounted on the body 30, and with two rows of second yarn-guide rings 52, 54 mounted in staggered positions on the arms 32, 34 (three rings for each arm in the embodiment described herein). The yarn coming from the distaff passes first through the first yarn-guide ring 50 and then, alternately, through the second yarn-guide rings 52, 54 with a zigzag path. All the yarn-guide rings in the embodiment described herein are preferably made of ceramic material.

[0022] In a per se known way, during the pickup of the yarn from the distaff, the arms 32, 34 react to peaks of tension by moving closer together in contrast with the

elastic force of the spring 37, so as to provide the desired damping and compensating action.

[0023] With particular reference now to Figures 6-10, according to the invention, the first yarn-guide ring 50 and the second yarn-guide rings 52, 54 are retained in corresponding contoured seats 56 and 58 of the body 30 and of the articulated arms 32, 34 by way of snap-action engagement means.

[0024] Since the yarn-guide rings are typically made of a relatively rigid material, usually a ceramic material, advantageously the contoured seats 56 and 58 are made of an elastically yielding material in order to allow the snap-action coupling.

[0025] Even more advantageously, the contoured seats 56 and 58 are defined by molding together with the body 30 and with the arms 52, 54, preferably in a plastic material.

[0026] With particular reference to the first yarn-guide ring 50, illustrated in detail in Figures 5 and 6, it has an annular head 50a which is adapted to slideably receive the entering yarn, and a cylindrical fixing portion 50b that has a smaller diameter, which protrudes coaxially from the annular head 50a and has an annular groove 50c. The contoured seat 56 of the body 30 has a cylindrical profile that is dimensioned to receive the cylindrical fixing portion 50b of the first yarn-guide ring 50, and is provided with four teeth 30t that protrude toward the inside in order to engage the annular groove 50c with snap-action.

[0027] With particular reference to the second yarn-guide rings 52, 54, illustrated in detail in Figures 7-10, each one of these has an annular end 52a which is adapted to slideably receive the yarn, and a plate-shaped fixing portion 52b which extends on the same plane as the annular end 52a. The plate-shaped fixing portion 52b has two recesses 52c, 52d on respective opposite faces, and has a foot 52e protruding on both of the opposite sides. Each one of the contoured seats 58 on the arms 32, 34 has a slot 58a with a substantially rectangular cross-section, into which the respective yarn-guide ring 52 can be inserted, and has two mutually opposing raised portions 58t1 and 58t2 which are adapted to engage the recesses 52c, 52d on the plate-shaped fixing portion 52b with snap-action and retention. With the mutually opposing internal raised portions 58t1 and 58t2 engaged in the recesses 52c, 52d, the foot 52e comes substantially into abutment against the bottom of a widened inlet end 58b of the slot 58a.

[0028] According to aim of the invention, the fixing system described herein for the yarn-guide rings is simple and light, and at the same time more practical and more reliable with respect to conventional systems. The invention is in fact based on the idea of using the elasticity of the material of the contoured seats that accommodate the yarn-guide rings in order to provide a snap-action fixing that is stable and precise.

[0029] A preferred embodiment of the invention has been described, but obviously the person skilled in the art may make various modifications and variations within

the scope of protection of the claims.

[0030] For example, the shape and the position of the contoured seats and of the yarn-guide rings can be modified according to requirements, while respecting the general principle of providing a snap-action coupling of the ring in the respective contoured seat. For example, although in the embodiment described the "male" element of the snap-acting engagement means is always integral with the contoured seat, and the "female" element is defined on the ring, obviously it would be possible to reverse the arrangement.

[0031] Furthermore, although in the embodiment described both the first yarn-guide ring 50 and the second yarn-guide rings 52, 54 use a snap-action fixing system according to the invention, obviously the invention could be applied only to one or some of them, while others could be fixed in a traditional manner.

[0032] The disclosures in Italian Utility Model Application No. 202018000002973 from which this application claims priority are incorporated herein by reference.

[0033] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A compensating weft brake device for textile applications, which comprises a body (30) that supports a first yarn-guide ring (50), and two articulated arms (32, 34) which are kept elastically tensed in a widened configuration and support respective rows of second yarn-guide rings (52, 54), **characterized in that** at least one among said first yarn-guide ring (50) and said second yarn-guide rings (52, 54) is retained in a corresponding contoured seat (56, 58) of the body (30) or of a respective one of the articulated arms (32, 34) by way of snap-action engagement means (50c, 30t, 52c, 52d, 58t1, 58t2).
2. The compensating weft brake device according to claim 1, **characterized in that** said contoured seat (56, 58) is made of an elastically yielding material in order to allow the snap-action coupling.
3. The compensating weft brake device according to claim 2, **characterized in that** said contoured seat (56) is defined by molding together with the body (30) or with a respective one of the articulated arms (32, 34).
4. The compensating weft brake device according to one or more of claims 1-3, **characterized in that** said snap-action engagement means comprise a male element (30t, 58t1, 58t2) which is integral with one of said contoured seat (56, 58) and the respective yarn-guide ring, and a corresponding female element (50c, 52c, 52d) which is integral with the other of said contoured seat (56, 58) and the respective yarn-guide ring (52, 54).
5. The compensating weft brake device according to claim 4, **characterized in that** the contoured seat (56) of said first yarn-guide ring (50) has a cylindrical profile in which a corresponding cylindrical fixing portion (50b) of said first yarn-guide ring (50) is engageable, said male element comprising teeth (30t) which protrude toward the inside of said contoured seat (56), said female element comprising an annular groove (50c) which is defined on said cylindrical portion (50b) and is engageable by said teeth (30t).
6. The compensating weft brake device according to claim 4 or 5, **characterized in that** the contoured seat (58) of each one of said second yarn-guide rings (52) has a slot (58a) which is adapted to receive a plate-shaped fixing portion (52b) of the second yarn-guide ring (52), said male element comprising a pair of mutually opposing raised portions (58t1, 58t2) which are defined in said slot (58a), said female element comprising a pair of recesses (52c, 52d) which are defined on respective opposing faces of said plate-shaped fixing portion (52b) and are engageable by said mutually opposing raised portions (58t1, 58t2).
7. The compensating weft brake device according to one or more of claims 1-6, **characterized in that** at least one of said first yarn-guide ring (50) and said second yarn-guide rings (52, 54) is made of ceramic material.
8. The compensating weft brake device according to one or more of claims 1-7, **characterized in that** said contoured seat is made of plastic material (56, 58).

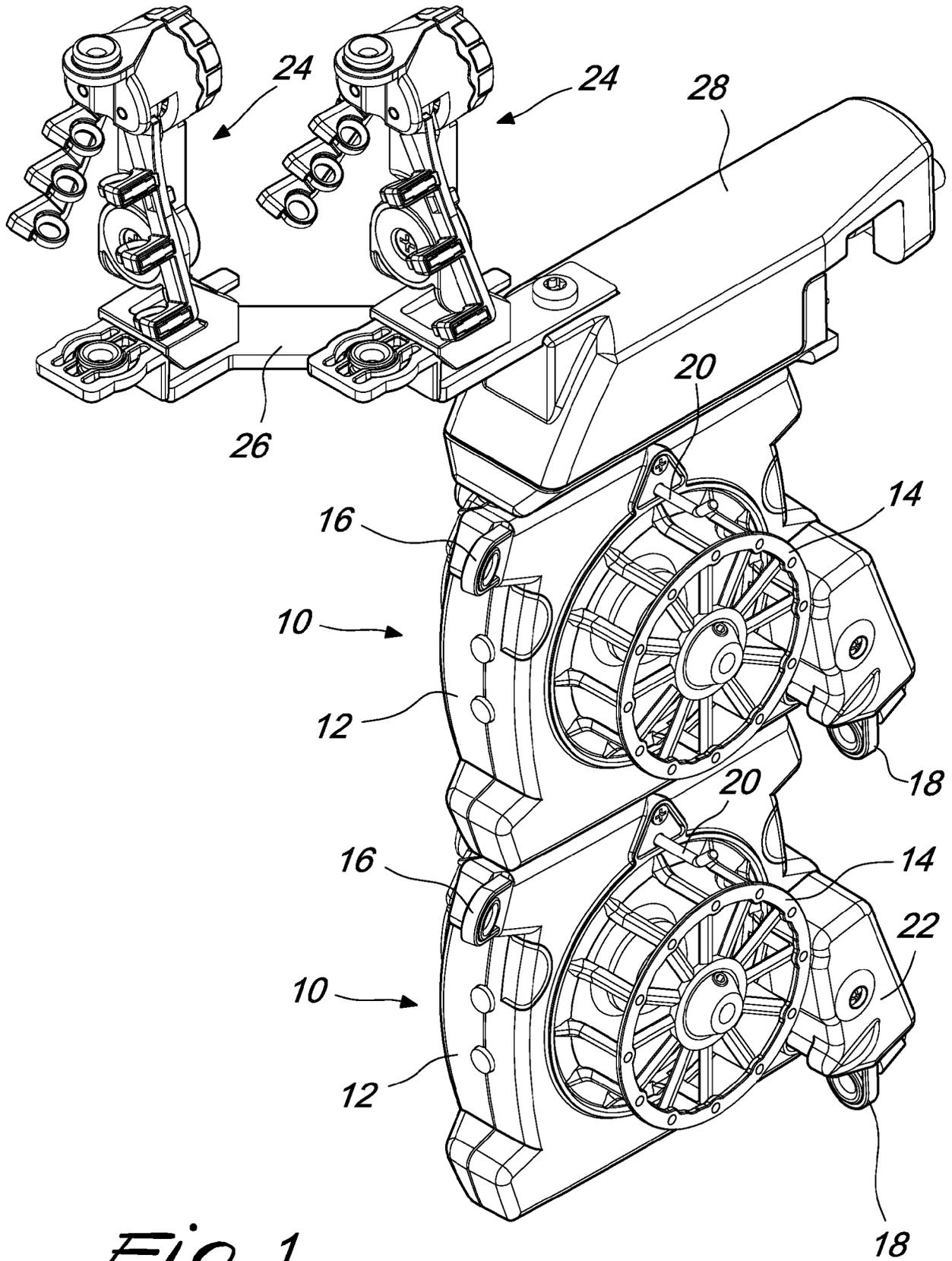


Fig. 1

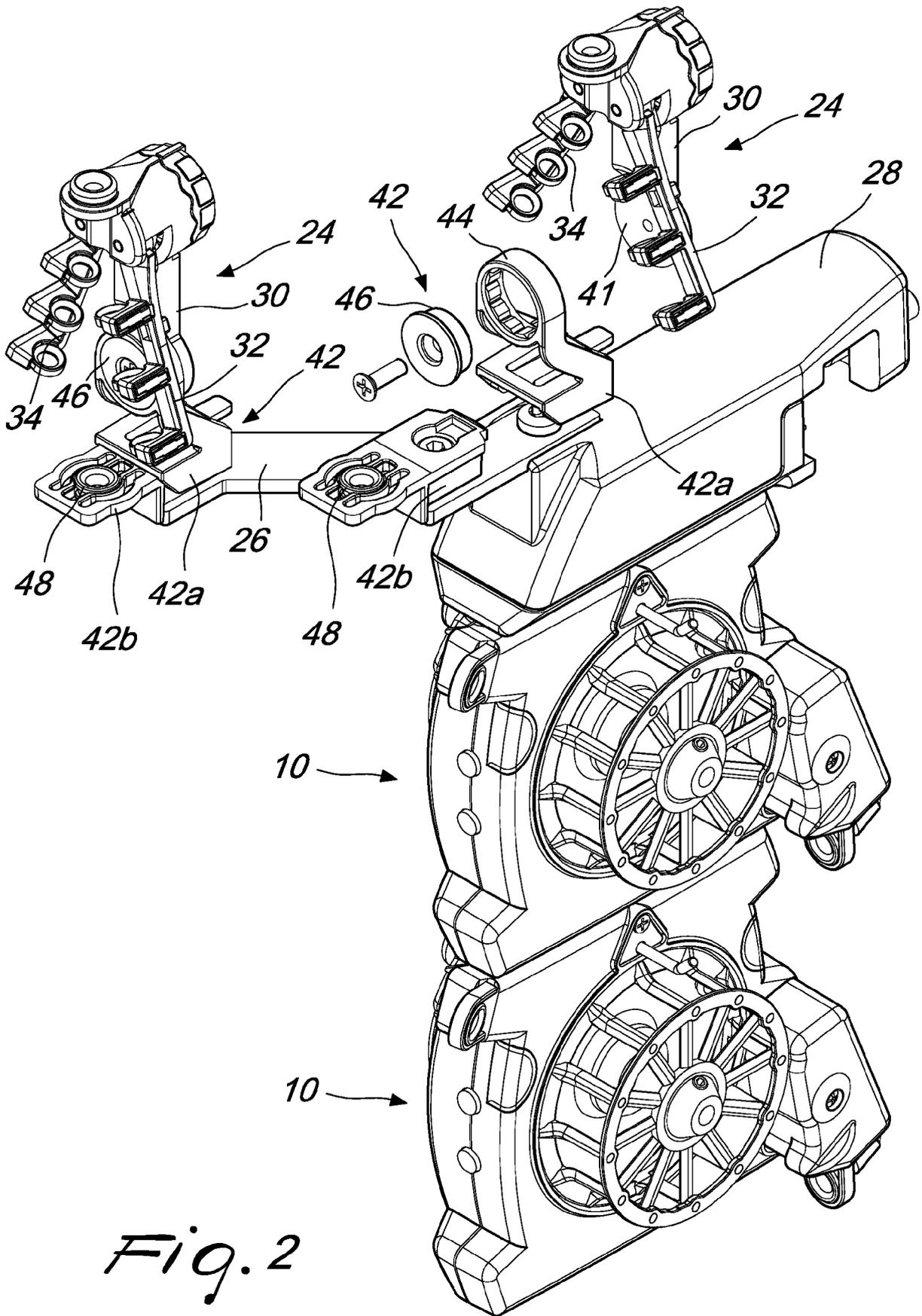
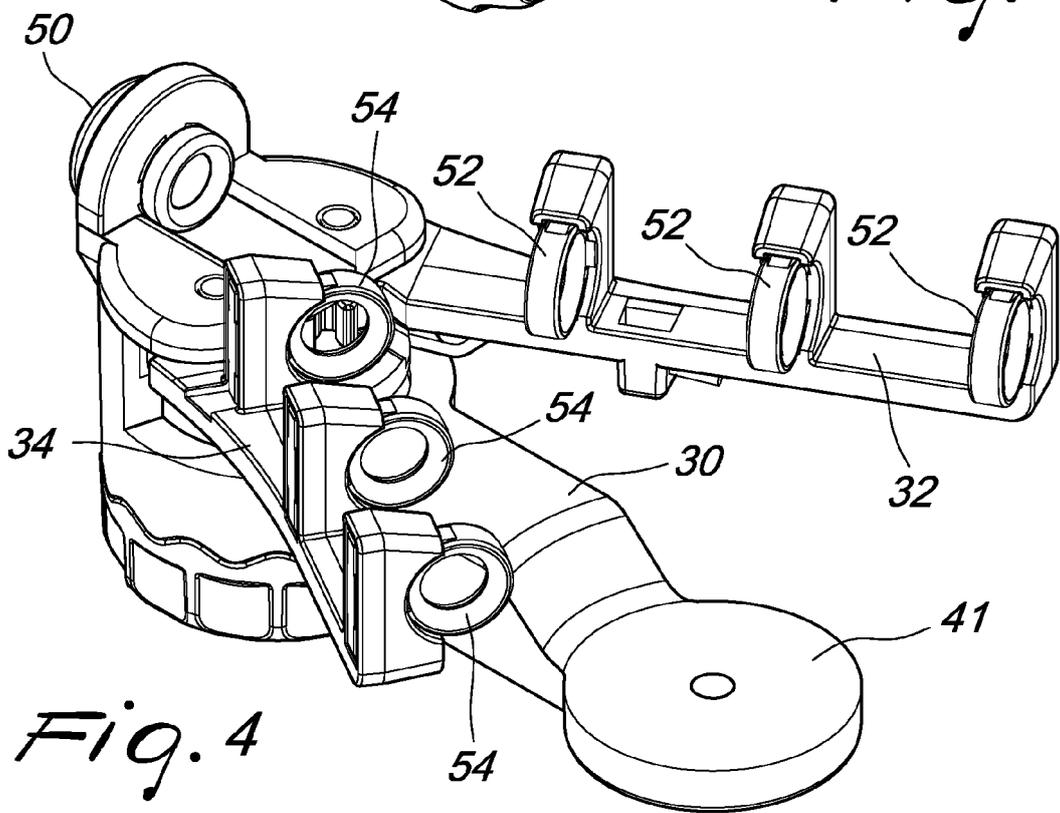
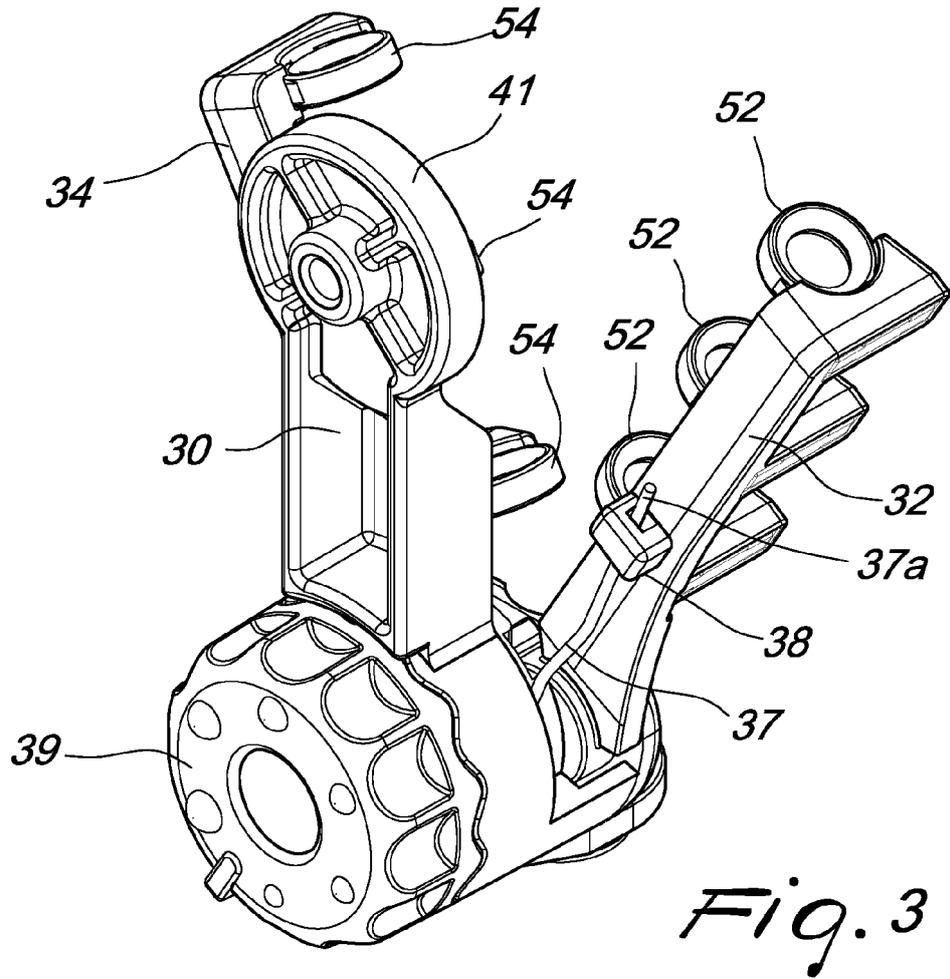
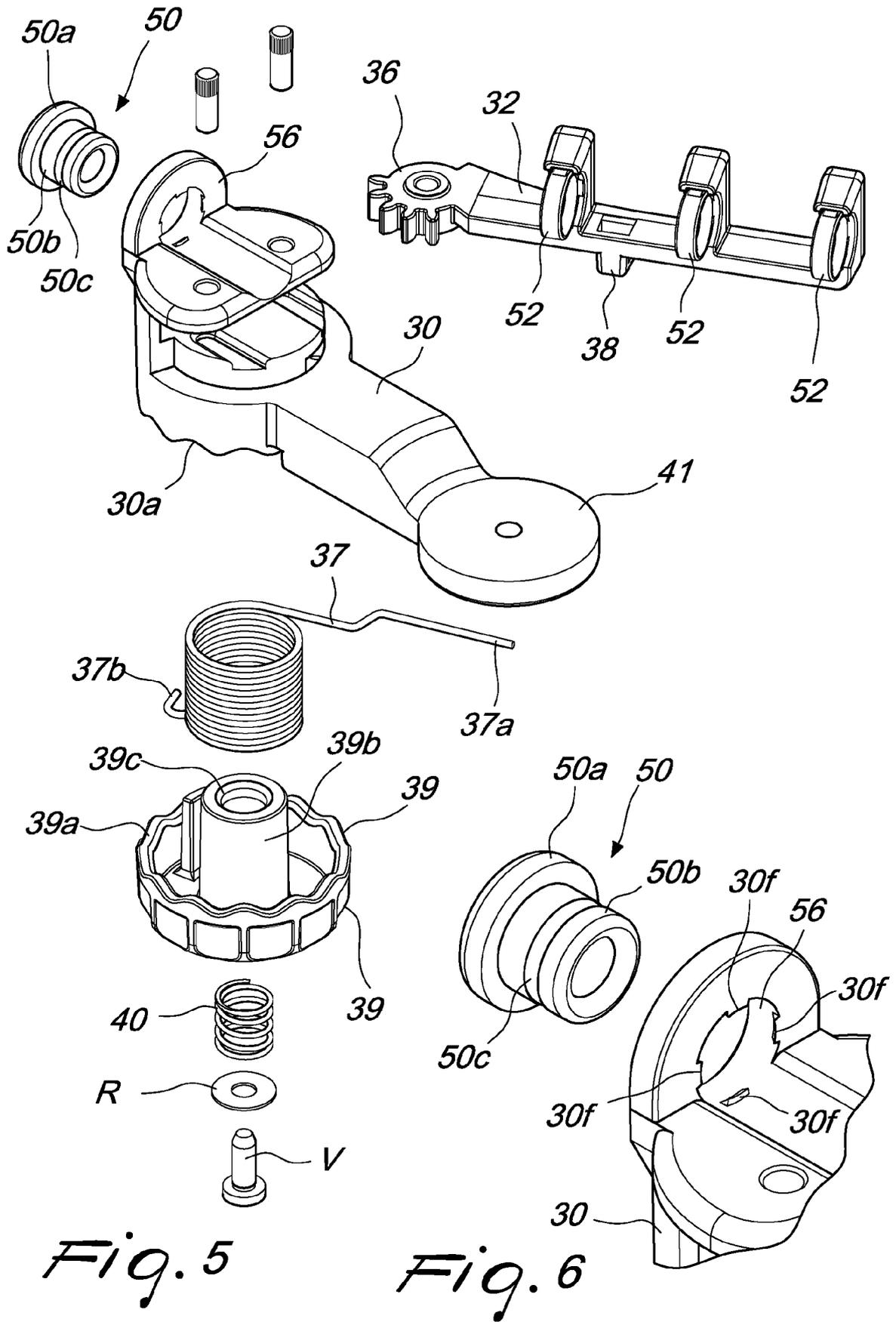


Fig. 2





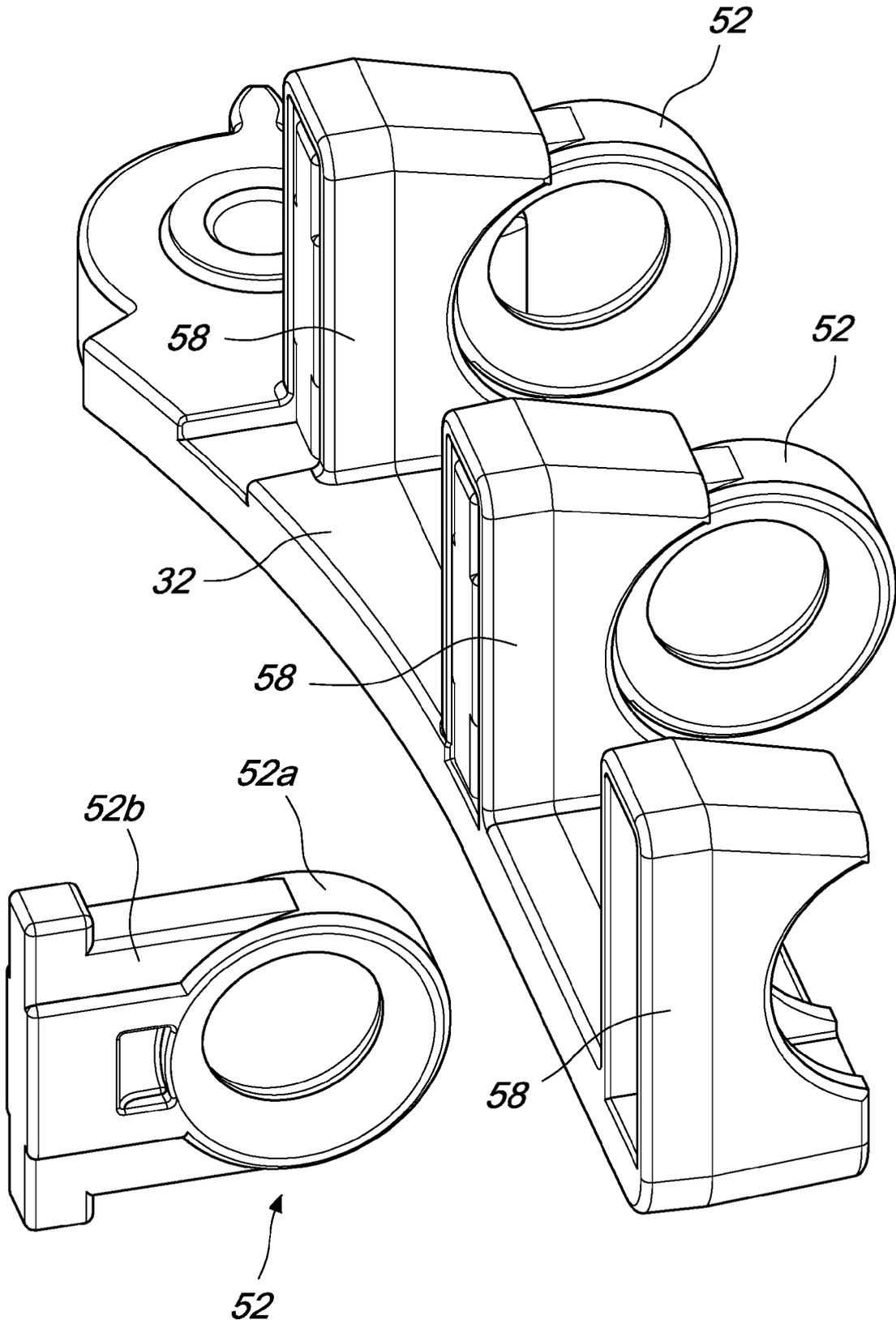


Fig. 7

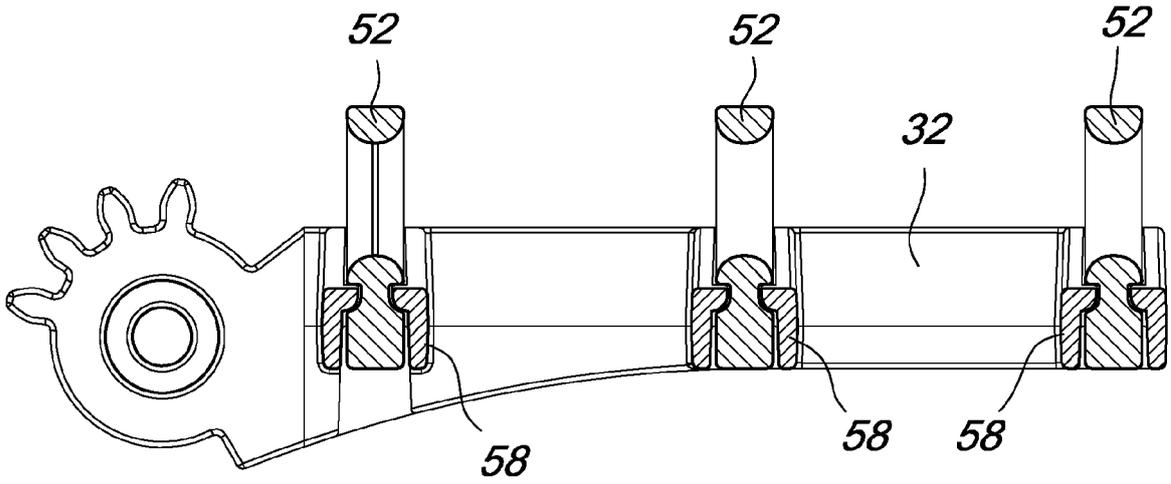


Fig. 8

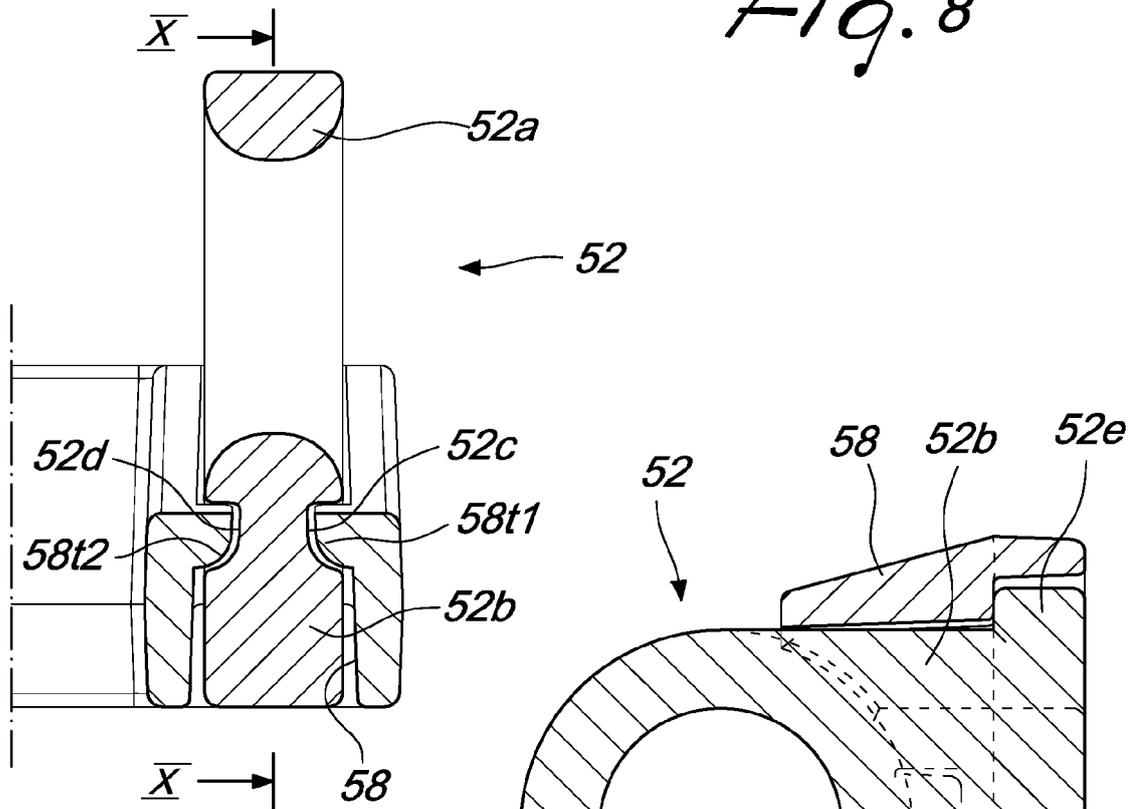


Fig. 9

Fig. 10



EUROPEAN SEARCH REPORT

Application Number
EP 19 18 4501

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X,D	EP 1 101 851 A1 (LGL ELECTRONICS SPA [IT]) 23 May 2001 (2001-05-23)	1-8	INV. D03D47/34 B65H59/16
Y	* paragraphs [0014] - [0017], [0021], [0022]; figures 1,2,2A,4 *	1-8	
Y	US 3 848 434 A (HOPKINS A) 19 November 1974 (1974-11-19) * abstract; figures 1,2 * * column 2, paragraph 40-61 *	1-8	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
Munich		29 October 2019	Louter, Petrus
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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