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(54) **Yan carrier moving device for a flat knitting machine**

Vorrichtung zur Bewegung von Fadenführerkasten für eine Flachstrickmaschine

Dispositif pour le mouvement des coulisseaux pour un métier à tricoter rectiligne

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Description

The present invention lies in the field concerning the construction of knitting machines.

There are currently known knitting machines including a pair of needle beds and a cam carrying carriage, running horizontally over them, aimed at selecting the needles which are lying in respective grooves made in the needle beds.

The carriage has also the task of controlling the feeding of the yarn coming from various reels to the working needles.

A number of slides are slidingly mounted on bars which are located over the needle beds; each slide supports a yarn carrier for feeding the yarn. The slides are moved to-and-from, when selected, by small anchors, which are fitted to the carriage and made movable vertically.

When a particular kind of fabric is being knitted, such as a fabric with different colours juxtaposed, various yarn carriers must be subsequently moved along subsequent path straps which are adjacent to each other, particularly a first yarn carrier and a second yarn carrier feeding yarn having different colours.

Therefore there is the need of making free the zone where the first yarn carrier is replaced with the second yarn carrier, in such a way that the two yarn carriers do not hinder each other.

Document EP-A-0 331 650 concerns a device that is fitted to a flat knitting machine that comprises a carriage moving along two needle beds and provided with anchor plates for dragging slides mounted upon a bar located above the needle beds. Thread guides are fixed to the slides, and each slide features a track in which two facing ledges are formed for engagement with an anchor plate to draw the slide in direction parallel to the bar.

The device includes two rockers which pivot upon each slide and comprise two arms. The first arm of each rocker is located over the slide and is acted upon by the anchor plate of the carriage, while the second arm of each rocker lays on a respective side of the slide.

With the second arm of a rocker being in contact with the respective slide side, the anchor plate of the carriage is prevented from striking against the ledge closer to that side. When the second arm is moved away from the slide side, the anchor plate is enabled to strike the ledge closer to that side and the slide is drawn along with the carriage.

The object of the present invention is to propose a yarn carrier moving device that releases the feed controlling carriage when it is in the swap position where a second yarn carrier is selected for being moved along a subsequent strap of path.

The above mentioned object is achieved by a device made in accordance with what there is stated in the claims.

The characteristic features of the invention are pointed out in the following, with particular reference to the accompanying drawings, in which:

- Fig. 1 is a prespective overall view of the device that is the subject of the present invention;
- Fig. 2 is a side view of this device as it is seen when the cam carrier carriage of the machine trails it;
- Fig. 3 is a side view of the device as it is seen from the side opposite to the view side of fig. 2 taken in a release phases from the carriage;
- Fig. 4 is a side view of the device that is the same view as in Fig. 2, but seen at the end of the release phase;
- Figs. 5 and 6 show this last side view of the device, during the return stroke of the carriage.
- Figs. 7 and 8 show a side view of a further embodiment of this device, respectively seen in the traling and in the release positions.

Referring to the above-mentioned figures, reference numeral 1 generally indicates the device that moves the yarn carrier 2 in a flat knitting machine. This machine includes a cam carrier carriage 3 that is made movable in horizontal directions over a pair of needle beds 4, which have grooves in which there are slidingly inserted respective needles.

The carriage 3 is equipped with small anchors 5, which are movable vertically and designed for trailing the moving device 1 in opposite directions, as it will be better explained in the following. A bar 6 overlies the needle beds 4 and is parallel thereto, so as to support the moving device 1 with possiblility of movements.

The moving device 1 includes a slide 7 that is slidably mounted on the bar 6 and that is equipped with locking means 8 simmetrically mounted at both its opposite ends respectively. In one side of the slide 7, in a middle position, there is a recess 10 made in the body 9 of the slide.

In the recess 10 there is housed an attachment guide 11 of the arm 12 of the yarn carrier 2. The arm 12 is fixed to the attachment guide 11 by means of a couple of screws 13 that pass through respective slots 14 made in the same arm 12.

The assembly made up by the attachment guide 11 and the yarn carrier 2 is pivoted to the body 9 of the slide 7, by means of a pin 15 transverse to the body 9, so that the assembly can oscillate in a plane longitudinal to the device.

Actuating means 16 for controlling the oscillatory motion of the yarn carrier 2 are positioned over the body 9 of the slide 7, and include substantially a first shaped rod 17 and a second shaped rod 18, which are positioned side by side and which can slide in a direction that is longitudinal to the slide 7.

The rods 17 and 18 are guided in the spaces delimited by a pair of guides 19 which are simmetrically made at the opposite ends of the body 9. The second rod 18 is pivoted centrally by means of a transverse pin 20 that

passes through a slot 21 made in a tailpiece 22 of the attachment guide 11 of the yarn carrier 2.

The first rod 17 has the ends protruding from the body 9 of the slide 7, bent upwards and then toward each other in "U"-like shape, so as to define symmetrical extensions 23 extending on a side of the same rod 17 and located in correspondence with the bendings.

The second rod 18 has also extensions 24 made at its ends, which are axially shorter than the extensions 23 of the first rod 17. The extensions 24 have an angle transverse profile, that is in fact complementar to the profile of the extensions 23. The extensions 23, 24 are designed for making a frontal stop for the small anchors 5 of the carriage 3.

The rods 17, 18 feature, along their lower edges, respective protrusions 25 which are in central positions and bevelled with respect to the motion directions. The protrusions 25 push on the upper side of a flexion spring plate 26, or leaf spring, that is supported by the body 9 in adjacency of the recess 10. The spring plate has the task of stabilizer.

The lower edges of the rods 17, 18 also present, in symmetrical positions, two respective shaped profiles, each of which includes three notches. More precisely, the first rod 17 presents, starting from each end, the notches 27, 28 and 29.

The first notch 27 has a side facing towards the center of the slide, this side being bevelled, and a shoulder on the opposite side, while each of the other notches 28 and 29 has both the sides bevelled.

The second rod 18 has, starting from each end, the notches 30, 31 and 32, which have the sides facing the center of the slide which are bevelled, and shoulders on the opposite side.

The above mentioned notches made in the rods 17, 18 are struck in turn by the head 33 of a ratchet 34 that is positioned at each end of the slide body 9. The ratchet 34 is slidably mounted into a vertical seat 35 that is made in the body 9, from which the ratchet head 33 protrudes, the ratchet being subjected to the action of a spring 36.

The upper ridge of the slide 7 body 9 features two trailing teeth 37 which define respective front stop planes for the small anchors 5. The trailing teeth are located in symmetrical positions, aside of the rods 17, 18.

Two rockers 38 are pivoted to the slide 7 body 9, in symmetrical position, and are each adjacent to a respecttive trailing tooth 37. The rockers can rotate about respective pins 39. The two rockers 38 have each a first arm 40 and a second arm 41, which are perpendicular to each other.

The first arm 40 extends lengthwise, with respect to the slide 7, and towards the center of the body 9; while the second arm 41 extends downwards in correspondence with a cavity 42 made in a side of the body 9. The first arm 40 is tapered at the free end, so as to form a first track 43.

A second track, symmetrical to the first one, is formed between the arms 40 and 41. The second arm 41 of the rockers 38 is adapted to push on the head of a stem 45, that passes through every locking means 8, lengthwise with respect to the device.

The lock 8 is formed by a prismatic body 46 that is linked to the slide 7 by means of a screw 47 inserted into a central seat 48 and engaging the front wall of the slide 7 body 9. The prismatic body 46 has a dovetail channel 49, through which it is slidingly supported by the bar 6, leaving a proper clearance. Preferably the prismatic body 46 is made up of two prismatic elements 46a and 46b joined together, so that it is made possible to adjust the channel 49 making up for wear occurence and the like.

The lock 8 is pushed against the body 9 of the slide 7 by a spring 50 that acts onto the head of the screw 47 and on the bottom of the seat 48. The seat 48 is properly larger than the screw 47, so that the body 46 of the lock is allowed to rotate between a position in which the slide 7 is free to run, and a position in which the slide 7 is blocked to the bar 6.

The lower part of the body 46 is held in abutment on a tooth 51 made in the front wall of the slide 7 body 9. This tooth 51 in fact acts as a rotation center for the body 46 of the lock 8. The upper part of the body 46 of the lock 8 has a cam-like protrusion 52. This cam 52 forms an ascending track 53 turned towards the center of the slide 7, then a descending track 54, a horizontal track 55 and a further descending track 56.

Shifting the lock 8 to the slide releasing position is actuated by means of a related unlocking device 57 that is made up of a further rod 58 that is slidably guided over the body 9, in a direction parallel to the rods 17, 18 of the actuating means 16, so that it comes out from the front wall of the body 9.

The rod 58 has, at the end turned towards the center of the slide 7, a small block 59 that defines a frontal stop plane. The block 59 has a longitudinal slot 60, and the pin 39 of the related rocker 38 passes through this slot.

There will be now described the working of the device starting from the trailing position shown in Fig. 2. In this positiion the carriage 3 strikes, by means of the small anchor 5, the trailing tooth 37 of the slide body 9 and the block 59 formed by the rod 58 of the unlocking device 57, that is positioned aside of the trailing tooth 37.

The block 59 is in fact struck before than the tooth 37 by the small anchor 5, so that the rod 58 of the unlocking device 57 is axially moved, and the related lock 8 is rotated to a position in which the slide 7 is free to run. During the working stroke, determined by the carriage 3, the ratchets 34 of the slide 7 engage with the central notches 28, 30 of the rods 17, 18 causing the yarn carrier 2 to be vertical.

At the end of the working stroke, the slide 7 comes in contact with a further similar slide 7a, that has the task of running the subsequent stroke strap. The further slide 7a is also mounted on the bar 6. (see Fig. 3).

The contact occurs in correspondence with the stems 45 which pass through the locks positioned at the

opposed ends. The stems 45 are then axially moved inwardly into the slides 7 and 7a (as shown by the arrow B) so as to push the arms 41 of the related rockers 38, thus provoking the angular rotation of the arm 40 in the direction indicated by the arrow C.

Because of the rotation of the arm 40, the small anchor 5 is pushed upwards so that it disengages from the trailing tooth 37 and from the block 59. The disengagement of the small anchor 5 from the block 59 makes the rod 58 of the unlocking device 57 free, so that the body 46 of the related lock 8 rotates under the action of the spring 50 and the slide 7 results to be blocked to the bar 6.

It should be noted that the locking occurs substantially in correspondence with the point indicated by F in Fig. 3, where the outer extremity of the channel 49 of the lock body 46 faces the lower face of the bar 6. The locking is obviously made by the lock 8 positioned at the fore-part of the slide 7, with respect to the motion direction, which pushes with its head on the bar 6, while the rear lock is inactive.

The movement of the carriage 3, that goes on with the stroke in the advancement direction A, provokes the shifting of the small anchor 5 with respect to the slide 7, as shown schematically by the broken line's in positions 5a and 5b, which concern subsequent positions of the small anchor. The small anchor 5 comes then to strike the front of the extension 23 of the first rod 17 of the actuating means 16 (see again Fig. 3).

The first rod 17 is then moved axially by the small anchor 5, for a short strap equal to the difference between the axial length of the extensions 23 and 24 of the rods 17 and 18, until the inner edges of the extensions 23 and 24 are lined up with each other. The notches of the rods 17 and 18 are then displaced with respect to each other.

The shifting of the first rod 17 also causes the ratchets 34 to be released, so that they can move to a retracted position inside the body 9 in contrast with the related spring 36 (arrow D). The shifting of the rod 18 provokes the oscillation of the arm 12 of the yarn carrier 2 about the pin 15, as indicated by the arrow E in Fig. 4.

The yarn carrier 2 rotates from the vertical working position 2a to a sloping position, so as to allow access to the zone where the second yarn carrier replaces the first one, so that the yarn carriers do not hinder each other. During this shifting, the small anchor 5 follows the profile defined by the cam 52 made on the upper wall of the lock body 46.

Particularly, the track 56 and 54 of the cam provoke the progressive raising of the small anchor 5 that, at the end of the stroke, disengages from the extensions 23 and 24 of the rods 17 and 18, as shown by the broken line 5c. When the carriage 3 goes on with the working stroke, the small strikes the track 53 of the related cam of the slide 7a, as indicated by 5d, to trail the second yarn carrier along the respective working stroke.

At the end of the stroke, then, the ratchets 34 spring one to the inside of the notches 29 and 32 of the rods 17 and 18, and the other one to the inside of the opposed notches 27 and 30 (arrow G) so that the locking of the yarn carrier 2 in the sloping position is safely made.

In Figs. 5 and 6 there are shown the locking and trailing phases for the slide 7 in the return stroke of the carriage 3 in direction R. The small anchor 5, that releases the slide 7a, runs downwards along the track 53 and strikes first the extension 23 of the first rod 17, that protrudes outwardly with respect to the corresponding extension 24 of the second rod 18. In this way the outer edges of the two extensions 23 and 24 are lined up with each other, and then the small anchor 5 moves both the rods 17 and 18 in synchrony.

The relative displacement between the two rods 17 and 18 causes the ratchets 34 to partially release (see Fig. 5). The synchronic shifting of the rods 17 and 18 provokes the oscillation of the yarn carrier 2 that takes again the vertical position.

This position is kept locked by the entrance of the ratchets 34 into the central notches 28 and 31. The small anchor 5 then follows the track 52 of the lock, rising the track 53 (position 5f in Fig. 6) so as to overcome the extensions 23 and 24 (positions 5g and 5h).

The small anchor 5 then runs along the track 44 of the rocker 38, that is located upstream with respect to the direction R, so as to rise along the arm 40 of this rocker 38 thus overcoming the related tooth 37 (position 5i). The small anchor 5 then goes to strike the block 59 of the unlocking device 57 for the lock 8 located downstream with respect to the direction R.

The rod 58 of the unlocking device 57 is therefore moved axially so as to provoke, in the way already described, the rotation of the body 46 of this lock 8, up to a position that allows the free run of the slide 7 along the bar 6. The advancement of the slide 7 occurs when the small anchor 5 moves the block 59 and strikes the related trailing tooth 37.

During the working stroke of the selected slide 7 that is trailed along the bar 6 by the carriage 3, the yarn carrier 2 is in fact kept in the vertical active position, so that the yarn is delivered to the group of working needles.

When the slide 7 reaches the end of the working stroke, striking a further slide 7a that is resting member, not shown and fixed to the bar 6), the yarn carrier 2 is moved to a position in which it slopes in a direction opposed to the movement direction A, so as to leave free the working zone. The slide 7 is locked in this end of stroke position by operating a related lock 8 of the slide 7.

The carraige 3 instead goes on with its stroke so as to engage a further slide 7a by means of the small anchor 5. The slide 7a is released and trailed along the bar 6 for the respective working stroke in a way similar to the one for the previously selected slide 7. The vertical position is taken again by the yarn carrier 2 when the carriage 3 runs the return stroke in direction R, and joins again the first slide 7.

Obviously, whe at the end of the stroke, the yarn carrier is again rotated to take the sloping position opposite to the movement direction R.

In Figs. 7 amd 8 there is shown a different embodiment of the subject device, this embodiment being particularly designed to be used in those cases where a limited oscillation is requested for the yarn carrier 2. To this aim, the arm 12 of the yarn carrier 2 is slidably mounted lengthwise in the attachment guide 11 and is connected with the pin 15 by means of a slot 61 made by a protrusion 62 extending from the same attachment guide 11.

The slot 61 is open downwards while the slot 21 of the upper tailpiece 22 of the attachment guide 11, into which the pin 20 of the yarn carrier actuating means 16 engage. The pin 15 is supported by a plate 63 fixed to the lower part of the slide body 9 so as to result in a position that is lowered with respect to the embodiment previously described.

The attachment guide 11 has a roller 64 positioned at its back, idling about a horizontal axis transverse to the bar 6. The roller 64 runs into a groove 65 that is made in correspondence of the recess 10 of the body 9 and that forms two paths downwardly converging. The groove 65 defines in fact a cam that is adapted for provoking the upward shifting of the yarn carrier 2 during its rotation to the sloping release position.

In the vertical trailing position shown in Fig. 7, the yarn carrier 2 is located at a lowered position defined by the vertex turned downwards of the groove 65. When the shifting of the rod 18 makes the yarn carrier arm 12 to oscillate about the pin 15, as previously described, the roller 64 is instead caused to follow the respective ascending path of the groove 65 (see Fig. 8).

The yarn carrier 2 therefore rotates from a vertical working position 2a to a position that is opposite to the current movement direction and makes, at the same time, a displacement upwards. The upward displacement of the yarn carrier 2, with respect to the pin 15 that is in turn moved to a lower position of the slide body 9, allows to limit the extent of the yarn carrier 2 oscillation in the release phase, without any change for the rod 18 stroke.

Claims

1. Device for moving the yarn carrier in a flat knitting machine comprising a carriage (3) horizontally movable over a pair of needle beds (4) provided with grooves wherein there are slidably inserted respective needles, the carriage being equipped with at least one small anchor (5) that is vertically movable and has the task of trailing a slide (7) in directions (A,R) parallel to the needle beds, this slide (7) supporting a yarn carrier (2) and being slidably mounted on a bar (6) which is located over said needle beds (4) and which is parallel thereto, the slide (7) being also equipped with two trailing teeth (37) adapted to be engaged by said small anchor (5) for trailing the slide in both movement directions (A,R) parallel to the needle beds, and with two rockers (38) swinging on respective pins (39) for disengaging said small anchor (5) from said trailing teeth (37), the device being **characterised in that** it includes :
lock means (8) mounted symmetrically at opposed ends of said slide (7) for locking said slide (7) to said bar 6;
actuating means (16) for making said yarn carrier (2) to oscillate between a working position in which it is vertical and a position in which it is sloping in a direction that is opposite to the movement direction (A,R) of the slide, so that the working position is left free, said actuating means including a first rod (17) and a second rod (18), the second rod (18) being pivoted to a central position of said yarn carrier (2), said rods (17,18) being positioned side by side and sliding lengthways with respect to the slide (7) and provided at their opposed ends with respective extensions (23, 24) adapted for being struck by said small anchor (5) while it is moving in one of both direction (A,R) parallel to the needle beds, said extensions (23) of the first rod (17) being axially longer than said extensions (24) of the second rod (18) so as to be struck by said small anchor (5) before said extensions (24) of the second rod (18).

2. Device as claimed in claim 1, **characterised in that** said rods (17, 18) have, along the lower edges and in symmetrical positions, two respective shaped profiles, each of which includes three notches (27, 28, 29, 30, 31, 32) designed for receiving therein, in turn the head (33) of a ratchet (34) located in adjacency of each end of the slide (7) body 9, the ratchet (34) being slidable vertically and subjected to elastic means (36) so as to cause the yarn carrier (2) to be vertical during the working stroke of the slide (7) and to cause the yarn carrier (2) to take said sloping position at the end of said working stroke.

3. Device as claimed in claim 1, **characterised in that** said lock means (8) respectively include a body (46) joined to said slide (7) by screw means (47) inserted into an enlarged seat (48) made in the body (46), said body (46) being pushed against the body (9) of the slide (7), by spring means (50), and featuring a channel (49) through which it is supported by said bar (6) leaving a suitable clearance, so that the same body (46) can rotate between a position in which the slide (7) is free and a position in which the slide is locked to said bar (6).

4. Device as claimed in claim 1, **characterised in that** said lock (8) is equipped with an unlocking device

(57) that includes a rod (58) slidingly guided lengthwise with respect to said slide (7) so as to come out from the front wall of the slide body (9), said rod also including a block (59) located at the end of the rod turned towards the centre of the slide (7), this block (59) defining a stop plane for said small anchor (5).

5. Device as claimed in claim 3, **characterised in that** said body (46) of the lock (8) has a cam (52) made on its upper, this cam being followed by said small anchor (5) and forming an ascending track (53), a descending track (54), a horizontal track (55) and a further descending track (56), in the direction towards the centre of the slide (7).

6. Device as claimed in claim 3, **characterised in that** said body (46) of the lock (8) is kept elastically in abutment on a tooth (51) made in the front wall of the slide body (9,) this tooth being designed to act as a rotational centre for the same body (46).

7. Device as claimed in claim 1, **characterised in that** said yarn carrier (2) bears a roller (64) idling on a horizontal axis transverse to said bar (6) and running inside a slot (65) made in the slide body (9), this slot defining two paths which converge symmetrically and downwardly so as to form a cam designed for upwardly shifting the yarn carrier (2) when it rotates to the sloping position.

Patentansprüche

1. Vorrichtung zum Bewegen des Faderführerkastens in einer Flachstrickmaschine, mit einem Schlitten (3), der horizontal über zwei Nadelbetten (4) bewegbar ist, die mit Nuten versehen sind, in denen entsprechende Nadeln gleitend gelagert sind, wobei der Schlitten mit mindestens einem kleinen Anker (5) versehen ist, der vertikal bewegbar ist und dazu dient, einen Schieber (7) in zu den Nadelbetten parallelen Richtungen (A,R) mitzunehmen, wobei der Schieber (7) einen Fadenführerkasten (2) trägt und auf einer Stange (6) gleitend gelagert ist, die oberhalb der Nadelbetten (4) angeordnet ist und parallel zu diesen verläuft, wobei der Schieber (7) ferner mit zwei Mitnehmerzähnen (37) versehen ist, an denen der kleine Anker (5) angreifen kann, um den Schieber in beiden Bewegungsrichtungen (A, R) parallel zu den Nadelbetten mitzunehmen, und wobei zwei Schwenkglieder (38) um entsprechende Zapfen (39) schwenkbar sind, um den kleinen Anker (5) von den Mitnehmerzähnen (37) zu lösen, **dadurch gekennzeichnet,** daß die Vorrichtung aufweist: Verriegelungsmittel (8), die symmetrisch an entgegengesetzten Enden des Schiebers (7) angebracht sind, um den Schieber (7) mit der Stange (6) zu verriegeln, und Betätigungsmittel (16) zum Hin- und Herbewegen des Fadenführerkastens (2) zwischen einer Arbeitsstellung, in der er vertikal verläuft, und einer Stellung, in der er schräg zu einer Richtung verläuft, die zu der Bewegungsrichtung (A,R) des Schiebers entgegengesetzt ist, so daß die Arbeitsstellung freibleibt, wobei die Betätigungsmittel einen ersten Stab (17) und einen zweiten Stab (18) umfassen, von denen der zweite Stab (18) in eine zentrale Stellung des Fadenführerkastens (2) schwenkbar ist, wobei die Stäbe (17,18) Seite an Seite angeordnet, in Längsrichtung bezüglich des Schiebers (7) gleitbar und an ihren entgegengesetzten Enden mit entsprechenden Verlängerungen (23,24) versehen sind, an denen der kleine Anker (15) anschlagen kann, während er sich in eine der beiden zu den Nadelbetten parallelen Richtungen (A,R) bewegt, wobei die Verlängerungen (23) des ersten Stabes (17) axial länger sind als die Verlängerungen (24) des zweiten Stabes (18), so daß sie von dem kleinen Anker (5) vor den Verlängerungen (24) des zweiten Stabes (18) erfaßt werden.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet,** daß die Stäbe (17,18) längs ihrer unteren Ränder und in symmetrischen Lagen zwei entsprechend geformte Profile aufweisen, von denen jedes drei Nuten (27,28,29,30,31,32) zur Aufnahme des Kopfes (33) einer Sperrklinke (34) bersitzt, die benachbart zu jedem Ende des Körpers (9) des Schiebers (7) angeordnet ist, wobei die Sperrklinke (34) vertikal gleitbar und von elastischen Mitteln (36) beaufschlagt ist, derart, daß der Fadenführerkasten (2) während des Arbeitshubes des Schiebers (7) vertikal verläuft und der Fadenführerkasten (2) am Ende des Arbeitshubes die besagte schräge Lage einnimmt.

3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet,** daß die Verriegelungsmittel (8) jeweils einen Körper (46) umfassen, der mit dem Schieber (7) durch Schraubenmittel (47) verbunden sind, welche in einen vergrößerten Sitz (48) des Körpers (46) eingesetzt sind, wobei der Körper (46) durch Federmittel (50) gegen den Körper (9) des Schiebers (7) angedrückt wird und einen Kanal (49) aufweist, durch den hindurch er von der Stange (6) unter geeignetem Spiel abgestützt wird, so daß der Körper (46) zwischen einer Stellung, in der der Schieber (7) frei ist, und einer Stellung, in der der Schieber mit der Stange (6) verriegelt ist, drehbar ist.

4. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet,** daß die Verriegelungsmittel (8) mit einer Entriegelungsvorrichtung (57) versehen sind, die einen Stab (58) umfaßt, welcher in Längsrichtung bezüglich des Schiebers (7) gleitend so geführt ist,

daß sie aus der Vorderwand des Schieberkörpers (9) vorsteht, wobei der Stab ferner einen Block (59) umfaßt, der an dem der Mitte des Schiebers (7) zugewandten Ende des Stabes angeordnet ist, wobei der Block (59) eine Anschlagebene für den kleinen Anker (5) bildet.

5. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet,** daß der Körper (46) der Verriegelungsmittel (8) einen Nocken (52) an seiner Oberseite aufweist, wobei der kleine Anker (5) dem Nocken folgt und der Nocken eine ansteigende Bahn (53), eine abfallende Bahn (54), eine horizontale Bahn (55) und eine weitere abfallende Bahn (56) in Richtung auf die Mitte des Schiebers (7) bildet.

6. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet,** daß der Körper (46) der Verriegelungsmittel (8) in elastischer Anlage an einem Zahn (51) gehalten wird, der in der Vorderwand des Schieberkörpers (9) gebildet ist, wobei dieser Zahn so ausgebildet ist, daß er als Drehmitte für den Körper (46) dient.

7. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet,** daß der Fadenführerkasten (2) eine Rolle (64) trägt, die auf einer horizontalen Achse quer zu der Stange (6) sich frei dreht und innerhalb eines Schlitzes (65) des Schieberkörpers (9) läuft, wobei dieser Schlitz zwei Bahnen bildet, die symmetrisch nach unten konvergieren, um einen Nocken zu bilden, der den Fadenführerkasten (2) nach oben bewegt, wenn er in die schräge Lage gedreht wird.

Revendications

1. Dispositif pour déplacer l'entraîneur de fil d'une machine à tricoter à plat comprenant un charriot (3) se déplaçant horinzontalement sur une paire de bancs d'aiguilles (4) dôtés de rainures dans lesquelles sont glissées les aiguilles respectives, le charriot étant équipé d'au moins une petite ancre (5) qui se déplace verticalement et a pour fonction de traîner une glissière (7) dans les directions (A, R) parallèlement aux bancs d'aiguilles, cette glissière (7) soutient un entraîneur de fil (2) et est est monté latéralement sur une barre (6) placée au-dessus des bancs d'aiguilles (4) susmentionnés, et parallèle à ceux-ci, la glissière (7) étant également équipée de deux dents d'entraînement (37) propres à être engagées dans ladite petite ancre (5) pour entraîner la glissière dans les deux directions de déplacement (A, R) parallèlement aux bancs d'aiguilles, et avec deux balanciers (38) qui se balancent sur des broches respectives (39) pour désengager ladite petite ancre (5) des dents d'entraînement (37) susmentionnées, le dispositif étant caractérisé en ce qu'il comprend :
des moyens de blocage (8) montés symétriquement aux extrémités opposées de ladite glissière (7) pour bloquer la glissière (7) en question sur la barre (6) ;
des moyens d'action (16) pour que ledit entraîneur de fil (2) oscille entre une position de travail dans laquelle il est vertical et une position dans laquelle il glisse dans une direction opposée à la direction de déplacement (A, R) de la glissière, de façon à ce que la position de travail soit laissée libre, lesdits moyens d'action comprenant une premiere tige (17) et une deuxième tige (18), la deuxième tige (18) étant pivotée sur une position centrale de l'entraîneur de fil (2) susmentionné, lesdites tiges (17, 18) étant placées côte à côte et coulissant dans le sens de la longueur par rapport à la glissière (7) et étant dotées à leurs extrémités opposées de prolongements (23, 24) propres à être frappés par ladite petite ancre (5) pendant son déplacement dans l'une des deux directions (A, R) parallèlement aux bancs d'aiguilles, les dits prolongements (23) de la première tige (17) ayant un axe plus long que les deuxièmes prolongements (24) de la deuxième tige (18) de façon à être frappés par ladite petite ancre (5) avant lesdits deuxièmes prolongements (24) de la deuxième tige (18).

2. Dispositif selon la revendication 1, caractérisé en ce que lesdites tiges (17, 18) ont, le long des bordures inférieures et dans des positions symétriques, deux profils de formes respectives, chaque profil comprenant trois encoches (27, 28, 29, 30, 31, 32) conçues pour recevoir, tour à tour la tête (33) d'un cliquet (34) situé à côté de chaque extrémité du bâti (9) de la glissière (7), lequel cliquet coulisse verticalement et est soumis à des moyens élastiques (36) de façon à pousser l'entraîneur de fil (2) en position verticale durant la frappe de la glissière (7) lorsque celle-ci est sélectionnée et de façon à placer l'entraîneur de fil (2) dans ladite position de coulissement à la fin de la frappe susmentionnée.

3. Dispositif selon la revendication 1, caractérisé en ce que lesdits moyens de blocage (8) comprennent respectivement un bâti (46) associé à ladite glissière (7) au moyen de vis (47) insérées dans un logement élargi (48) ménagé dans le bâti (46), lequel bâti (46) est poussé contre le bâti (9) de la glissière (7), par des moyens de ressort (50), et présente une chaîne (49) par laquelle ladite barre (6) le porte en laissant un espace suffisant, de façon à ce que ce même bâti (46) puisse tourner entre la position dans laquelle la glissière (7) est libre et la position dans laquelle la glissière est bloquée à ladite barre (6).

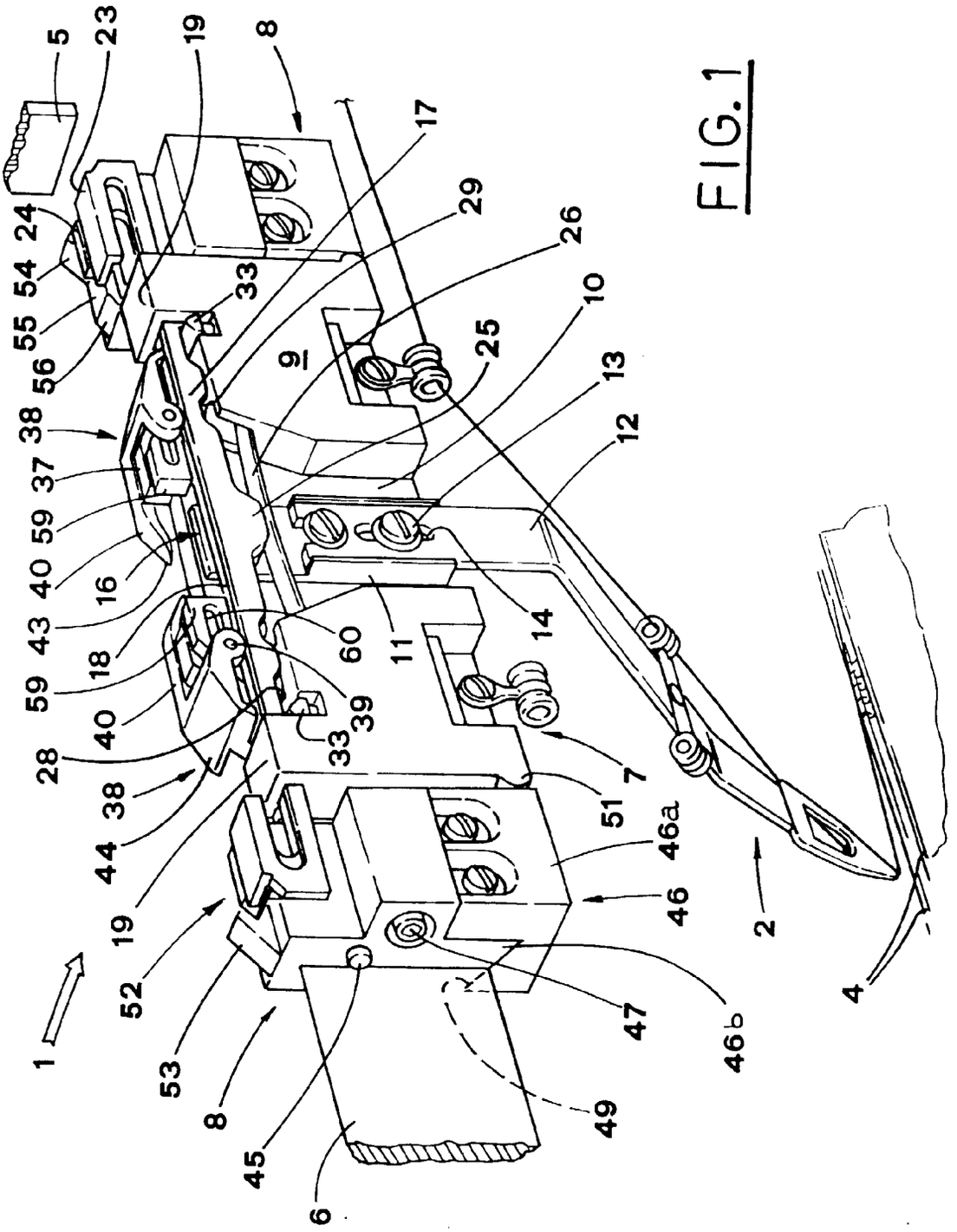
4. Dispositif selon la revendication 1, caractérisé en ce que ledit blocage (8) est équipé d'un dispositif

de déblocage (57) qui comprend une tige (58) coulissant à l'intérieur de guide dans le sens de la longueur par rapport à ladite glissière (7) de façon à sortir de la paroi avant du bâti (9) de la glissière, ladite tige comprenant aussi une cale (59) placée à l'extrémité de la tige tourné vers le centre de la glissière (7), cette cale (59) définissant un plan d'arrêt pour ladite petite ancre (5).

5. Dispositif selon la revendication 3, caractérisé en ce que ledit bâti (46) du blocage (8) comprend une came (52) ménagée à son sommet, cette came étant suivie de ladite petite ancre (5) et formant une piste ascendante (53), une piste descendante (54), une piste horizontale (55) et une autre piste descendante (56), dirigées vers le centre de la glissière (7).

6. Dispositif selon la revendication 3, caractérisé en ce que ledit bâti (46) du blocage (8) est élastiquement gardé en butée sur une dent (51) ménagée dans la paroi avant du bâti (9) de la glissière, cette dent étant conçue pour agir comme un centre de rotation pour le bâti (46) en question.

7. Dispositif selon la revendication 1, caractérisé en ce que ledit entraîneur de fil (2) supporte un rouleau (64) articulé sur une poutre d'axe horinzontal à ladite barre (6) et passant à l'intérieur d'une fente (65) ménagée dans le bâti (9) de la glissière, cette fente définissant deux chemins qui convergent symétriquement et vers le bas de façon former une came conçue pour remonter l'entraîneur de fil (2) lorsque qu'il se tourne dans la position de coulissement.


5
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8
45
6
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14
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12
39
33
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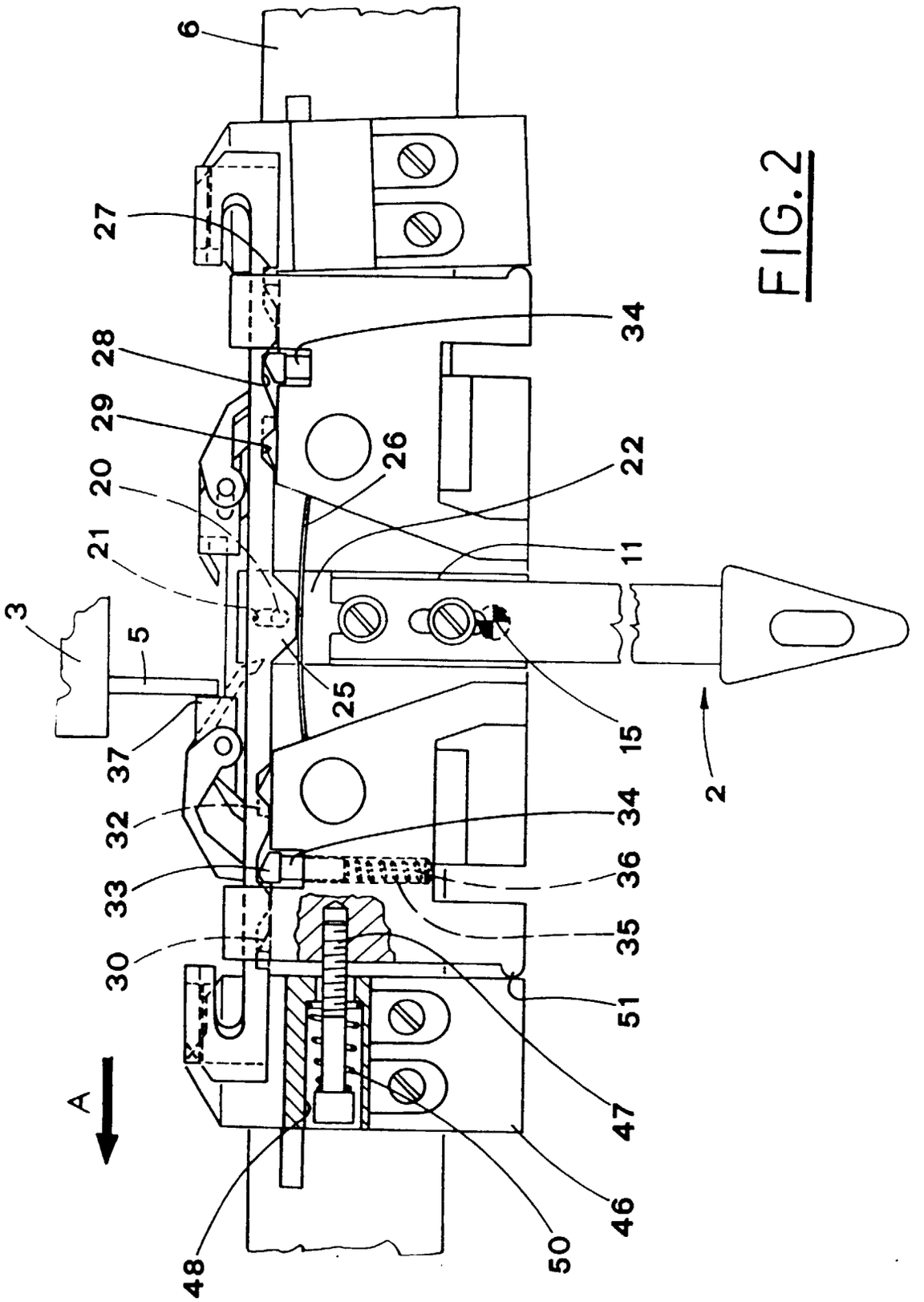
51
46a
46
47
46b
49
2
4

FIG. 1


6
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A
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11
34

FIG.2

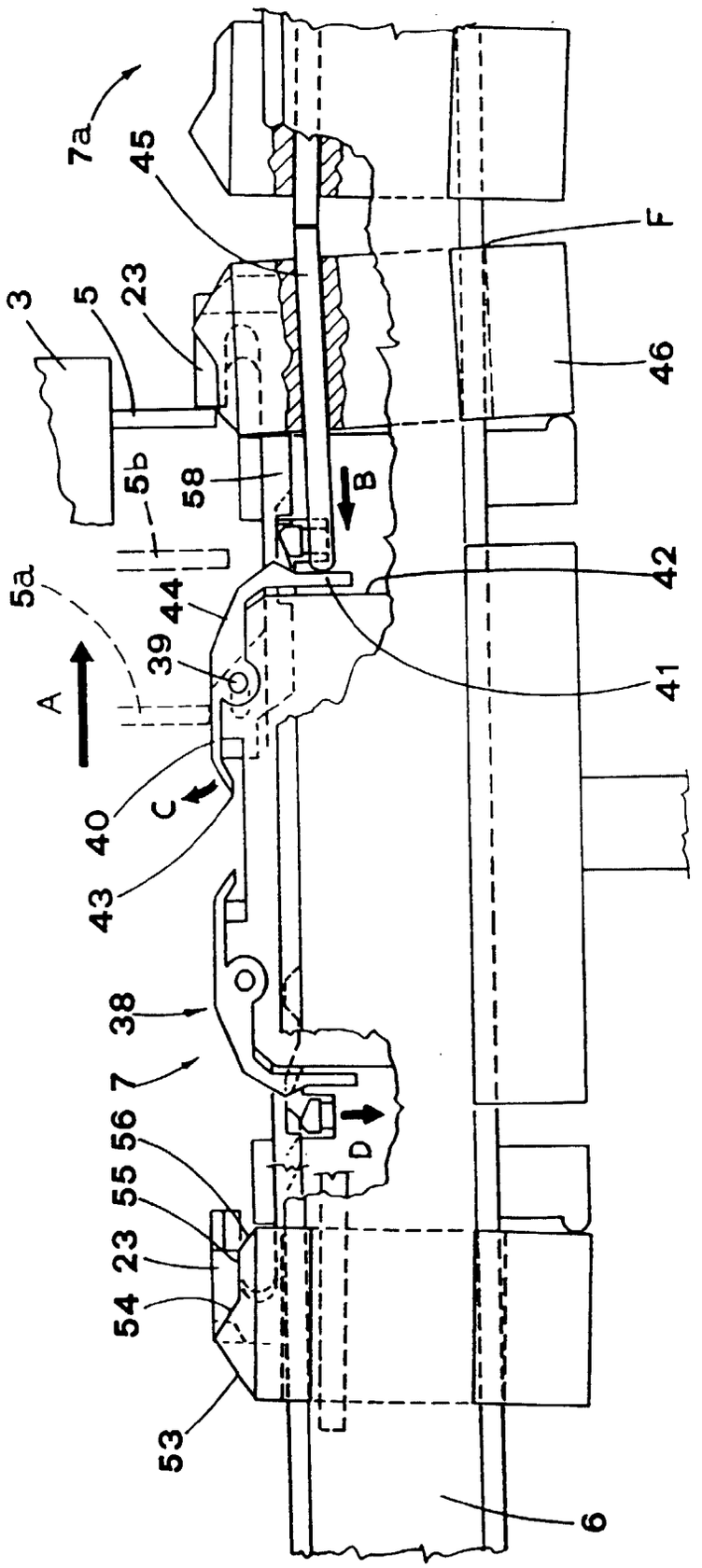


FIG. 3

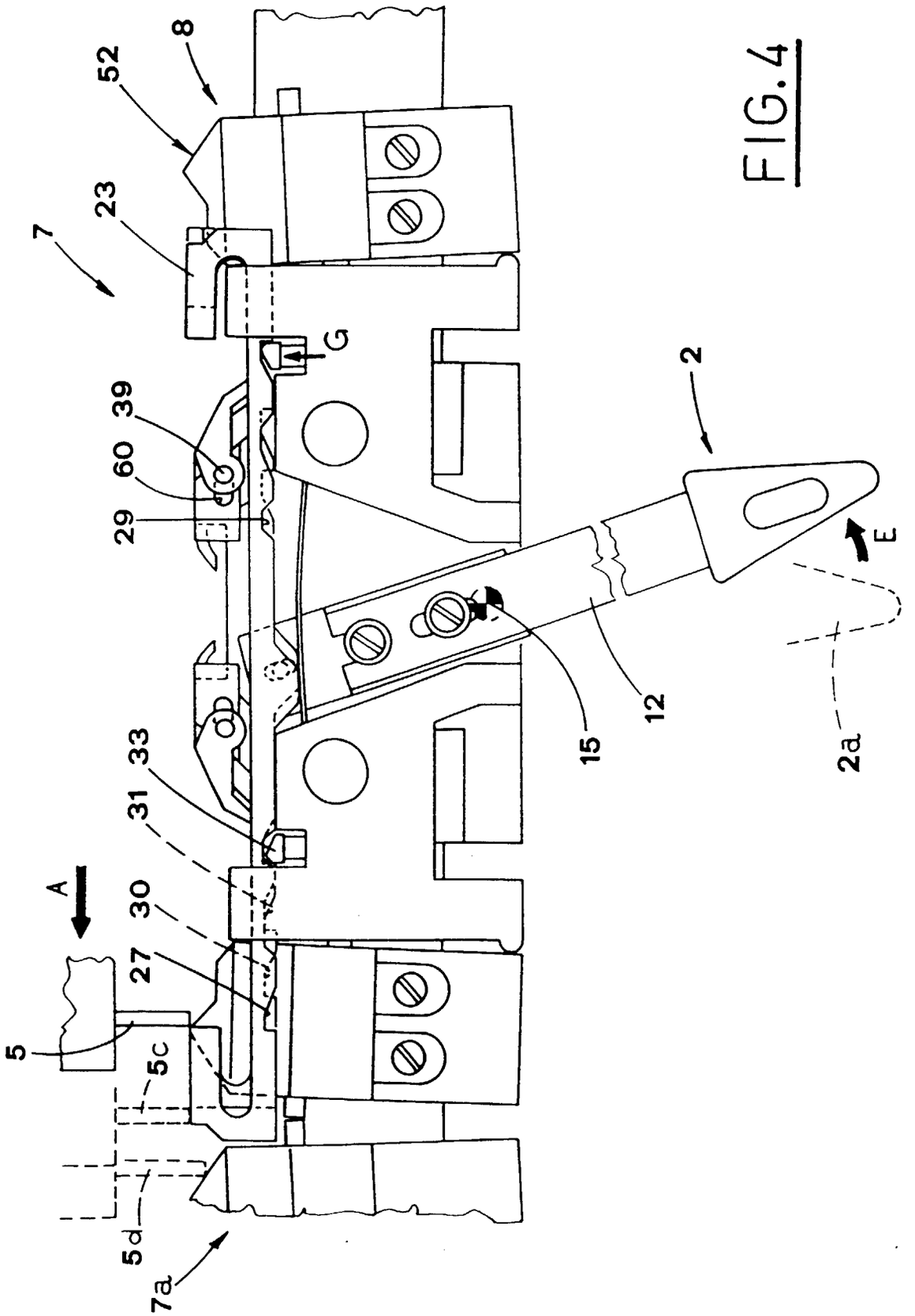


FIG.4

FIG. 5

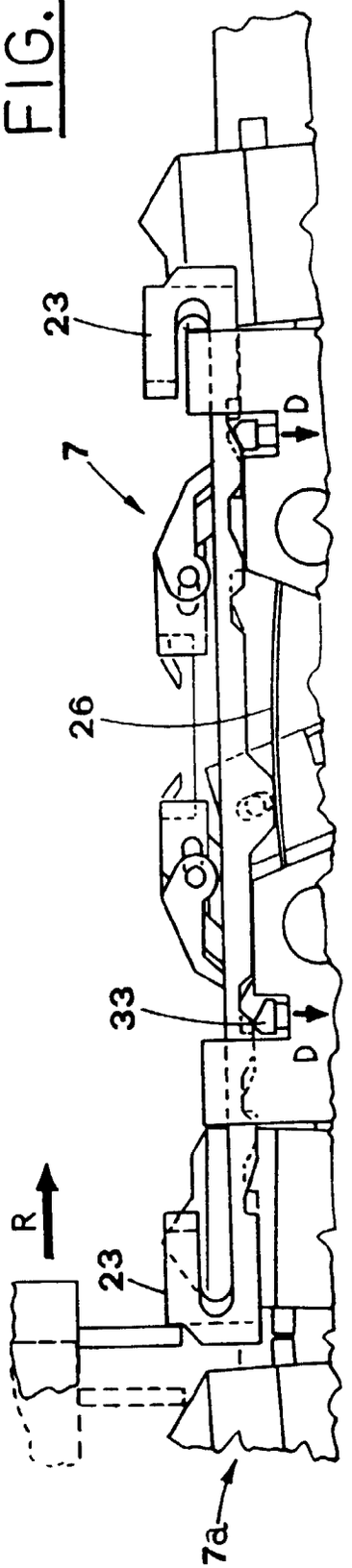
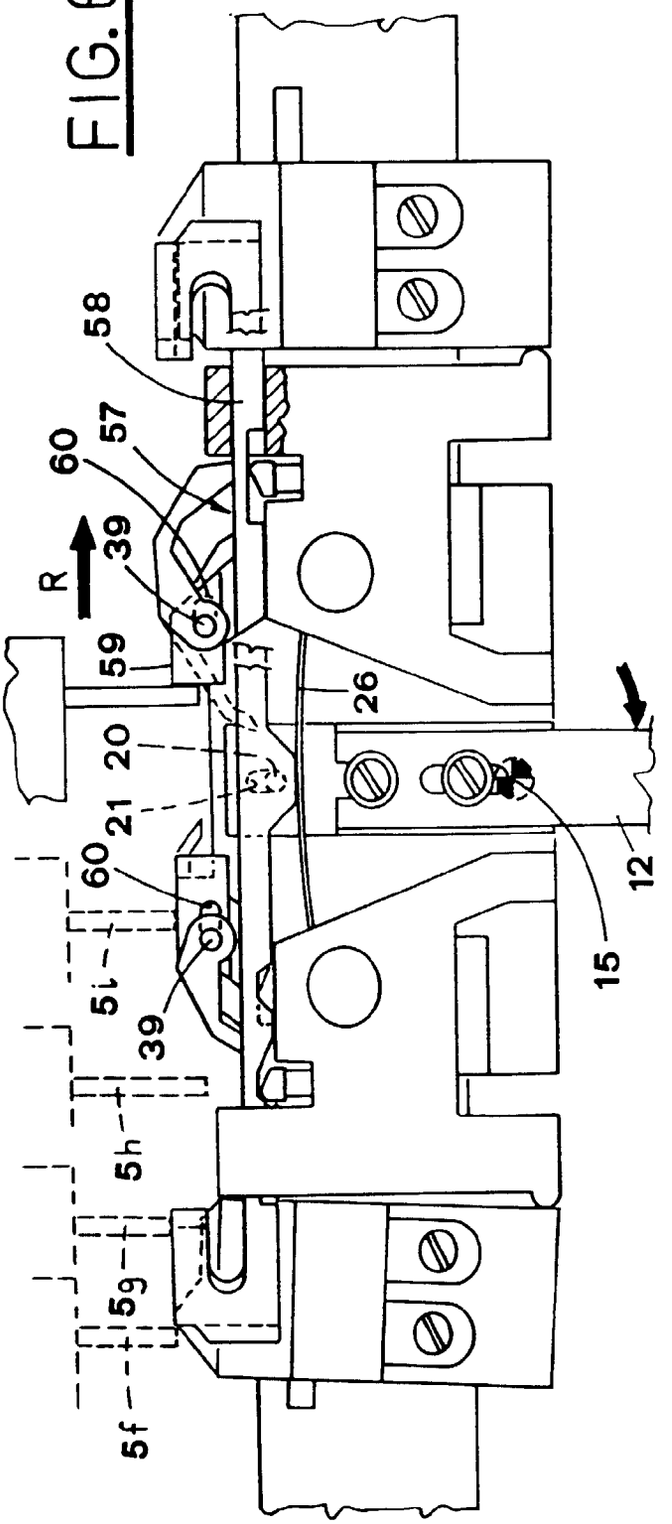


FIG. 6



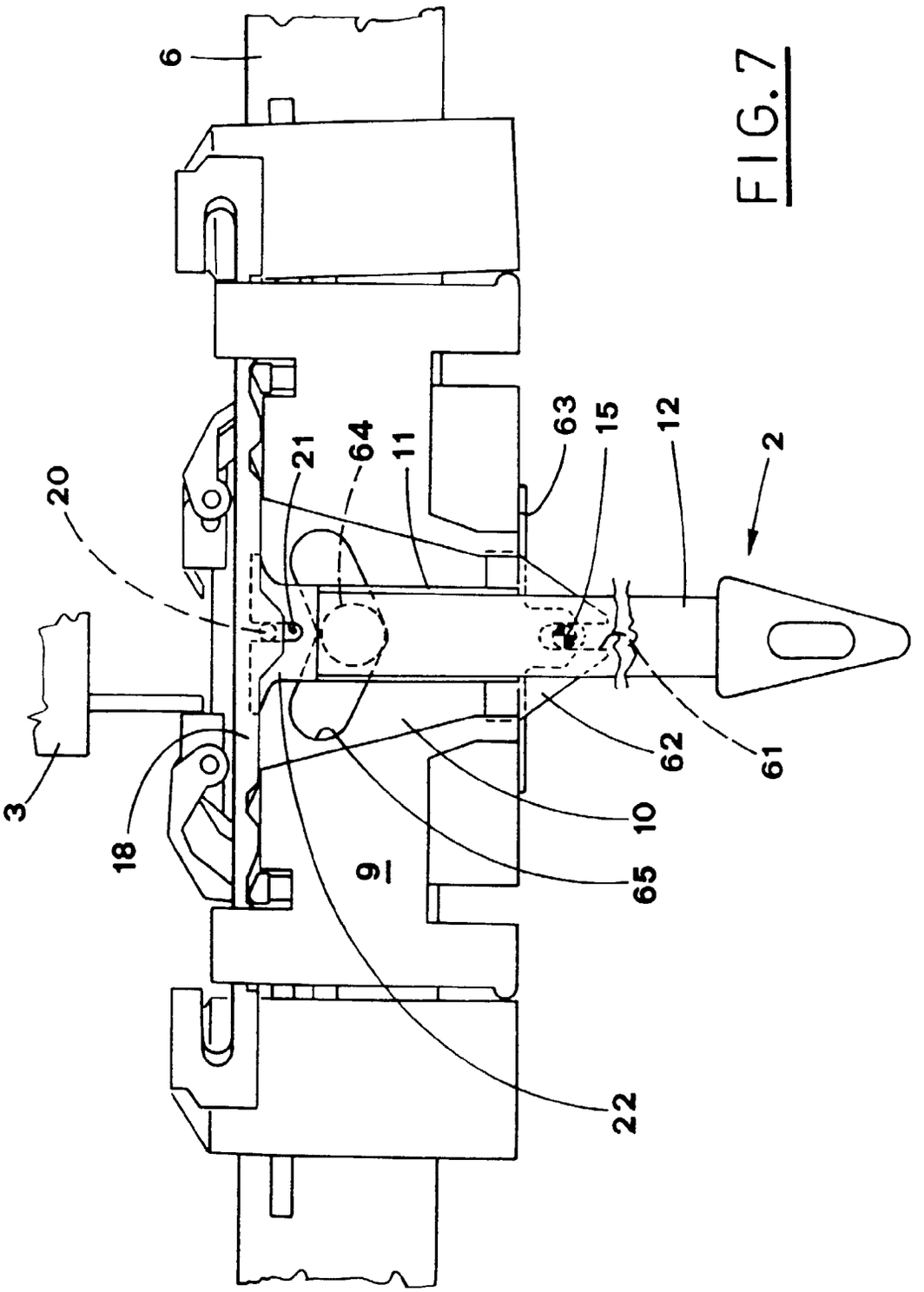


FIG.7

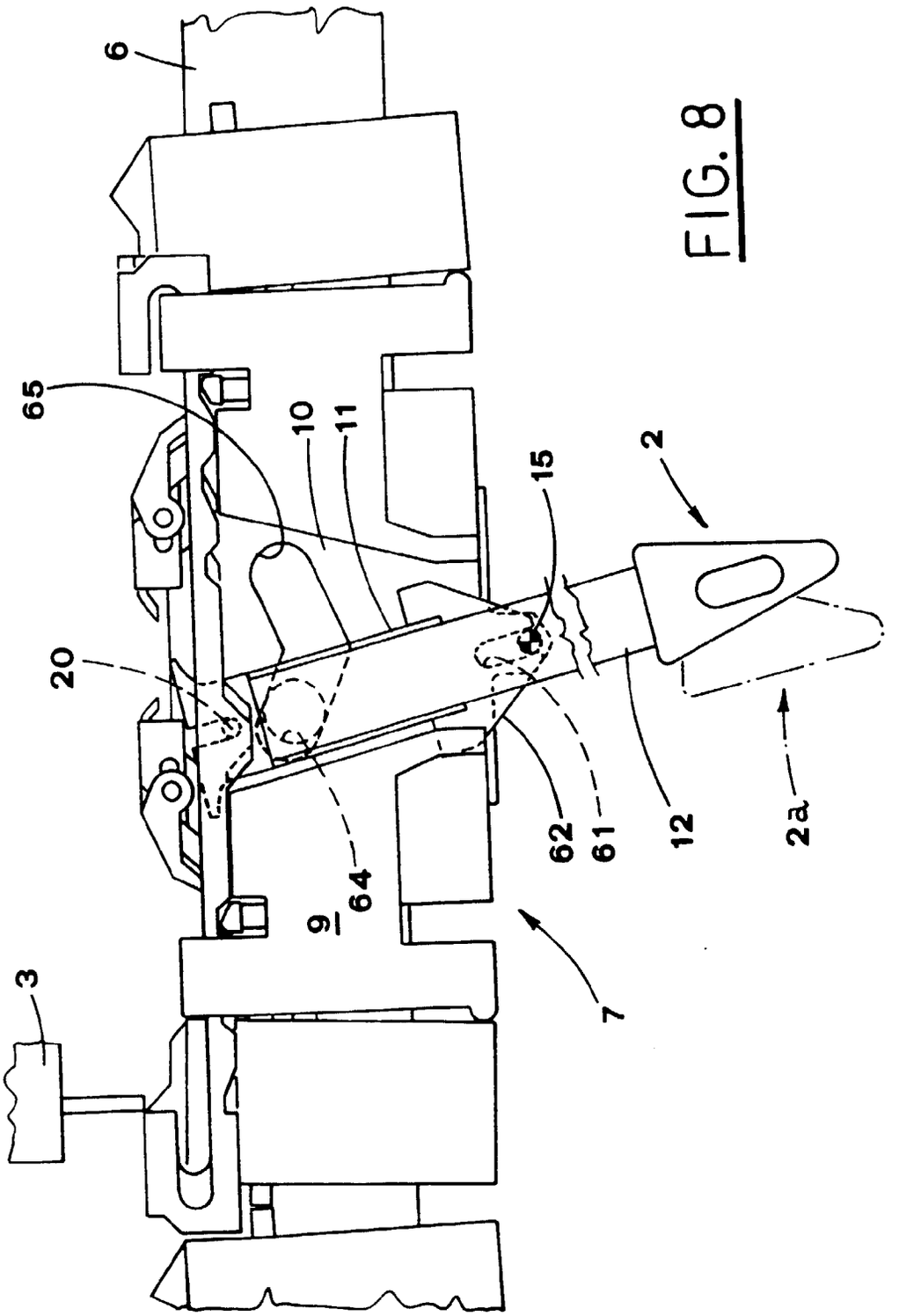


FIG. 8