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(54) **MACHINE FOR INTRODUCING A RIBBON INSIDE THE RINGS OF A CHAIN**

MASCHINE ZUM EINFÜHREN EINES BANDES IN DIE RINGE EINER KETTE

MACHINE POUR L'INTRODUCTION D'UN RUBAN À L'INTÉRIEUR DES MAILLONS D'UNE CHAÎNE

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Description

TECHNICAL FIELD

[0001] The present invention relates to a machine for producing, preferably but not exclusively, finishes of fashion accessories such as belts, handles and shoulder straps of handbags made with chains and ribbons of textile materials, leather or synthetic materials, woven into the chains.

[0002] More in particular, the invention relates to a machine for introducing a ribbon inside the rings of a chain according to an undulated trend.

State of the art

[0003] Fashion accessories, and in particular handbags, with handles and shoulder straps made with chains inside which ornamental ribbons are woven, have been available on the market for several years. An example of a chain-shaped barrette with strip inside it is shown in US5979466.

[0004] Currently, the operation of associating the ribbons with the chains is performed exclusively by hand, with noteworthy expenditure of labor.

[0005] The speed required of the labor force often translates into problems of imprecision in the steps of insertion of the ribbon into the chain, with the obvious problems of quality that this causes.

Object and summary of the invention

[0006] The object of the present invention is to expedite the operations of association of ribbons inside chains.

[0007] Another important object of the present invention is to obtain a machine that allows a production of chains with ribbon of high quality.

[0008] One more object of the present invention is to produce a machine that allows ribbons to be associated with chains in such a way as to reduce the personnel employed for this operation.

[0009] These and other objects, which will be more apparent below, are achieved with a machine for introducing a ribbon inside the rings of a chain according to an undulated trend, which comprises:

- a sliding guide for the chain;
- means for controlled feed of the chain on this guide;
- means for blocking a part of the ribbon on the chain, with the ribbon longitudinally facing at least in part a first face of the chain, so that one end of the ribbon, opposite the direction of feed of the chain, is free;
- a first insertion unit adapted to push, in a first direction, a portion of ribbon into a first ring of the chain it is facing, to form an increasing eyelet (or loop) on the opposite face of the first ring with respect to that of insertion, the first insertion unit is adapted to act until the free end of the ribbon passes through the first ring, reaching the second face of the chain;
- a second insertion unit adapted to push, in a second direction opposite the aforesaid first direction, the portion of ribbon that has passed through the first ring into a second ring, subsequent to the first with respect to the direction of feed of the chain, to form an increasing eyelet (or loop) on the opposite face of the second ring with respect to that of insertion into the second ring, said second insertion unit is adapted to act until the free end of the ribbon passes through the second ring, returning to the first face of the chain.

[0010] Other aspects of the invention are found in the appended claims and in the description below.

Brief description of the drawings

[0011] Further characteristics and advantages of the invention will become more apparent from the following description of a preferred but non-exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Fig. 1 represents a front perspective view of a machine according to the invention, during an operating step thereof;
Fig. 2 represents a rear perspective view of a machine according to the invention, during an operating step thereof;
Fig. 3 represents a side view of the machine of the preceding figures, in a first initial operating step;
Fig. 4 represents a side view of the machine of the preceding figures, in a second operating step;
Fig. 5 represents a side view of the machine of the preceding figures, in a third operating step;
Fig. 6 represents a side view of the machine of the preceding figures, in a fourth operating step;
Fig. 7 represents a side view of the machine of the preceding figures, in a fifth operating step;
Fig. 8 represents a side view of the machine of the preceding figures, in a sixth operating step;
Fig. 9 represents a side view of the machine of the preceding figures, in a seventh operating step.

Detailed description of an embodiment of the invention

[0012] With reference to the figures cited above, a machine for introducing a ribbon inside the rings of a chain according to an undulated trend is indicated as a whole with the number 10. The chain being processed is indicated as a whole with the letter C, while a ring of the chain is indicated with the letter A. The ribbon, which can be made of any non-rigid, flaccid material such as fabric, nonwoven fabric, leather, imitation leather, film etc., is indicated as a whole with the letter F.

[0013] The chain C can have flat dimensions, or have an extension, or length, prevalently longitudinal, a trans-

verse width corresponding substantially to the width of a ring A, and a thickness similar to the thickness of a ring or of a pair of rings, in the areas in which two subsequent rings are superimposed. Hereinafter, the sides of the chain defined by the longitudinal length and by the transverse width, or the opposite "wide" sides of the chain, on which the rings A are open, are defined as "faces" C1 and C2.

[0014] The machine 10 is provided with a frame, not indicated specifically, with which the various components indicated below are associated.

[0015] The machine 10 comprises a sliding guide 11 for the chain C (in Fig. 1 the guide is sectioned along its centerline to allow better viewing), in this example defined by a sliding surface 11A, preferably horizontal or preferably slanting in a single direction, or with normal lying on a vertical plane, and opposite lateral containment edges 11B. These edges 11B can be spaced at a distance from each other to adjust the width of the guide as a function of the width of the chain. Moreover, in other preferred embodiments, the edges are held pushed against the chain, to create a predetermined friction, adjustable, and ensure a particularly precise feed movement.

[0016] The machine 10 also has means 12 for controlled feed of the chain C on the guide 11, which comprise, for example, gripper 13 adapted to clamp the chain C when controlled. In this example, preferably, the gripper 13 is provided downstream with respect to the area of insertion H of the ribbon into the chain with reference to the direction of feed K of the chain (indicated by the arrow marked with K, concordant to the guide 11).

[0017] The gripper 13 is associated with a translation actuator 14, for example a pneumatic cylinder that allows it to move; the gripper is fixed to the actuator 14, for example, by means of a bracket 14A. As will be more apparent below, the gripper 13 clamps the chain during the steps of insertion of the ribbon F into the same chain, are then moved (still clamping the chain) by a desired step, for example the distance corresponding to the length of a single ring, drawing with them the chain; the gripper is opened (a pneumatic control member is associated, for example, with the gripper) and returned (again by means of the translation actuator 14) to the preceding position and is then clamped on the chain again. It should be noted that in Figs. 1 and 2, in order to simplify the drawing, the gripper is always shown open, or not clamping the chain; however, it must be understood that in these figures the gripper clamps the chain, or are closed, just as in the other figures.

[0018] The means 12 for controlled feed of the chain C can also (or alternatively) comprise a rotating reel, motorized, on which the chain with the ribbon inserted is wound (and which can help to pull the chain), not shown in the figures.

[0019] The means 12 for controlled feed of the chain on the guide 11 also comprise a centering and/or retaining abutment 12A placed on the guide 11 upstream of the area of insertion H of the ribbon into the chain. This abutment is adapted to be reversibly inserted, when controlled, into a respective ring A3, positioned on the opposite side with respect to the gripper 13 with respect to the area H. For example, this abutment is moved by a translation actuator 12B, positioned vertically, so that the abutment 12A, fixed to the actuator, is able to translate inside the ring of the chain, or to withdraw in a position outside the ring, releasing it.

[0020] The machine 10 also comprises means for blocking a part of the ribbon F on the chain C, with the ribbon that is longitudinally facing at least in part the first face C1 of the chain C, so that one end F1 of the ribbon, opposite the direction of feed of the chain (indicated by the arrow marked with K, concordant to the guide 11), is free.

[0021] In the preferred embodiments, as in this example, the gripper 13 presses the ribbon on the chain and, therefore, besides acting as means for movement of the chain, the gripper produces blocking of the ribbon on the chain.

[0022] According to the invention, the machine 10 comprises a first insertion unit 15 adapted to push, in a prima direction (indicated by the arrow Z), in this example a vertical direction from top to bottom, a portion of ribbon F into a first ring A1 of the chain it is facing, to form an increasing eyelet S (or loop) on the opposite face C2 of the first ring A1 with respect to that of insertion, as can be seen in Figs. 1, 2, 4 and 5.

[0023] This first insertion unit 15 is adapted to act until the free end F1 of the ribbon F passes through the first ring A1, reaching the second face C2 of the chain (Fig. 6), or in this example the lower face.

[0024] Preferably, the first insertion unit 15 comprises a pusher 16, arranged above the guide 11 (with the exception of the final part of its movement through the chain), which has, for example, a translation actuator 16A (for example a pneumatic cylinder) with an insertion end 16B that is moved by the same actuator in direction incident to the faces of the chain, in this example the direction Z orthogonal to the sliding surface 11A of the guide 11.

[0025] In practice, the insertion end 16B of the pusher 16 encounters the ribbon F that is above the first ring A1, pushes the portion of ribbon inside the ring A1, passing through it, thus creating the eyelet S that increases, on the opposite face, with the travel of this pusher inside the ring, until the pusher is stopped and returned to the initial position, above the first ring (Figs. 2, 5 and 6).

[0026] The first insertion unit 15 also comprises a removal device 17, that has a first inserter 17A, arranged below the guide 11, associated with actuation means that make the inserter movable from a standby position (Figs. 1, 3 and 4) to a position inserted in the eyelet S formed by the pusher 16. Subsequently, the first inserter 17A is movable in a direction away from the sliding guide 11 (Figs. 2, 5), drawing with it the part of ribbon not yet inserted in the subsequent rings, so that the eyelet S is

enlarged until the free end F1 of the ribbon passes through the ring A1 and the related portion of ribbon, from the first ring A1 is located completely below the chain C, or below the second face C2 thereof.

[0027] Advantageously, in this embodiment, the first inserter 17A is associated with a pair of movement actuators 17B and 17C.

[0028] The first actuator 17B, for example a pneumatic cylinder, is adapted to move the inserter 17A, for example having a pointed or common end adapted to enter the eyelet S, according to a horizontal direction X or, more in general, according to a direction X incident to a plane parallel to the direction of sliding of the chain and of the two pushers, or in this example a vertical plane.

[0029] The second actuator 17C, for example a pneumatic cylinder, is adapted to move the inserter 17A on the aforesaid plane to move away from said guide, preferably with a direction slanting from the guide toward the rear part of the machine, or the part opposite the area of insertion H, or slanting from the top toward the bottom.

[0030] In this example, the first actuator 17B is fixed, for example by means of a bracket 17D, to the second actuator 17C, so that this latter moves the assembly formed by the first actuator 17B and by the related inserter 17A, as can be seen in Figs. 2 and 5.

[0031] The machine 10 also comprises a second insertion unit 115, the same as the first unit 15, but arranged with the related pusher below the guide 11 and functionally overturned with respect to the first unit 15, or arranged symmetrically to the first unit 15 with respect to the guide 11, as can be seen in the figures. Hereunder the components of the second insertion unit 115 corresponding to the components of the first unit 15 will be indicated with the same reference numerals, increased by 100.

[0032] In this example, the pushers 16 and 116 (and more in particular their ends 16B and 116B) of the two units 15 and 115, are mutually aligned, or translate with their operating ends along a same vertical line.

[0033] Therefore, the second insertion unit 115 is adapted to push, in a second direction 1Z, opposite the first direction Z, the portion of ribbon that has passed through the first ring A1, into a second ring A2 to form an increasing eyelet S2 (or loop) on the second face C1, as can be seen, for example, in Figs. 4 and 5. The second insertion unit 115 is adapted to act until the free end F1 of the ribbon passes through the second ring, returning above the first face of the chain.

[0034] The second insertion unit 115 then has a second removal device 117 with a second inserter 117A moved by two actuators 117B and 117C.

[0035] Naturally, the machine comprises an electronic control system for the actuators and the various parts, for example a PLC system, not indicated in the figures.

[0036] Operation of the machine is for example given by the following operations managed by the electronic system, preferably performed in sequence:

- moving of the centering and/or retaining abutment 12A into a ring A3 of the chain C, to determine the correct position of the chain on the guide 11,
- closing of the gripper 13 to clamp chain C and ribbon F, with ribbon facing the chain,
- moving of the first pusher 16 downward into the first ring A1 of the chain, encountering the ribbon before entering the ring A1, thus pushing the ribbon F into the first ring and forming an eyelet S on the opposite face C2 to the face on which it entered the ring,
- moving of the first pusher 16 to exit from the first ring A1 in the opposite direction to the direction from which it entered,
- moving of the first inserter 17A into the eyelet S formed by the first pusher 16,
- moving of the first inserter 17A away from guide 11 of the chain, increasing the dimension of the eyelet S until the end F1 of the ribbon exits from the first ring A1, or the ribbon is free from the first ring up to its end F1 and is facing the face C2 of the chain opposite the face of insertion of the first pusher,
- moving of the centering abutment 12A to exit from the ring of reference A3 of the chain,
- moving of the gripper 13 in the direction of feed of the chain, drawing therewith the chain by a step equal to one ring,
- moving of said centering abutment 12A to enter a ring subsequent to the ring it entered previously,
- moving of the second pusher 116 into a second ring A2 of the chain, subsequent to the first, encountering the ribbon F before entering the ring, thus pushing the ribbon into the second ring A2 and forming an eyelet on the opposite face to the face on which it entered the ring,
- moving of the second pusher 116 to exit from the second ring in the opposite direction to the direction from which it entered,
- moving of the second inserter 117A into the eyelet S formed by the second pusher 116,
- moving of the second inserter 117A away from the guide 11 of the chain, increasing the dimension of the eyelet until the end of the ribbon F1 exits from the second ring A2.

[0037] Preferably, the gripper, after having been moved forward by one step is opened and releases the chain and the ribbon, and then moved back by one step and closed again to clamp chain and ribbon.

[0038] These steps are repeated unit the ribbon is inserted in all the desired rings of the chain.

[0039] The accompanying figures show in particular the following moments:

Fig.1 first pusher 16 inserted in the ring A1 and pushing on the ribbon, with formation of an eyelet above the lower face C2 of the chain, and end 16B of the pusher still inside the ring and the eyelet;

Fig.2 first inserter 17A inside the eyelet, to move

away from the guide and increase the dimension of the eyelet;
Fig.3 initial step in which the ribbon is simply resting on top of the chain (and the gripper block the ribbon on the chain) and the two pushers are moved away from the chain;
Fig.4 first pusher 16 inserted in the ring A1 and pushing on the ribbon, forming an eyelet, and end 16B of the pusher still inside the ring and the eyelet;
Fig.5 first inserter 17A inside the eyelet, to move away from the guide and increase the dimensions of the eyelet;
Fig.6 pushers moved away from the chain, ribbon inserted in the ring A1 with the end on the side of the lower face C2 of the chain and the inserters returned to initial position, and gripper with chain translated by one step corresponding to the length of a ring;
Fig.7 second pusher 116 inserted in the ring A2 and pushing on the ribbon, with formation of eyelet above the upper face C1 of the chain, and end 116B of the pusher still inside the ring and the eyelet;
Fig.8 second inserter 117A inside the eyelet, to move away from the guide and increase the dimensions of the eyelet;
Fig.9 pushers moved away from the chain, ribbon inserted in the ring A2 with the end on the side of the upper face C1 of the chain and the inserters returned to initial position, and gripper with chain translated by one step corresponding to the length of a ring.

[0040] It is understood that the drawing only shows possible non-limiting embodiments of the invention, which can vary in forms and arrangements without however departing from the scope of the concept on which the invention is based. Any reference numerals in the appended claims are provided purely to facilitate the reading thereof, in the light of the above description and accompanying drawings, and do not in any way limit the scope of protection.

Claims

1. A machine (10) for introducing a ribbon (F) inside the rings (A) of a chain (C) according to an undulated trend, comprising

   - a sliding guide (11) for the chain (C);
   - means (12) for controlled feed of the chain (C) on said guide (11);
   - means (13) for blocking a part of the ribbon (F) on the chain (C), with said ribbon longitudinally facing at least in part a first face (C1) of said chain (C), so that one end of said ribbon (F), opposite the direction of feed of the chain (C), is free;
   - a first insertion unit (15) adapted to push, in a first direction, a portion of ribbon (F) into a first ring (A1) of the chain (C) it is facing, to form an increasing eyelet or loop (S), on the opposite face of the first ring (A1) with respect to that of insertion, said first insertion unit (15) being adapted to act until the free end of the ribbon (L) passes through said first ring (A1), reaching the second face (C2) of the chain (C);
   - a second insertion unit (115) adapted to push, in a second direction opposite said first direction, the portion of ribbon (F) that has passed through said first ring (A1) into a second ring (A2) to form an increasing eyelet, or loop, on the opposite face of said second ring (A2) with respect to that of insertion into the second ring (A2), said second insertion unit (15) being adapted to act until the free end of the ribbon (F) passes through said second ring (A2), returning to the first face (C1) of the chain (C).

2. The machine according to claim 1, wherein each insertion unit (15, 115) comprises

   - a pusher (16, 116) adapted to move one end thereof in a respective incident direction to a respective face (C1, C2) of the chain (C), through a respective ring (A1, A2) to push the portion of ribbon (F) facing the respective ring into the same ring to form on the opposite face said increasing eyelet or loop,
   - a removal device (17, 117) having a first inserter (17A, 117A) movable from a standby position to a position inserted in said increasing eyelet and subsequently movable in a direction away from said sliding guide (11), drawing with it the part of ribbon not yet inserted in the subsequent rings, so that said eyelet is enlarged until the free end of the ribbon passes through said ring.

3. The machine according to one or more of the preceding claims, wherein said means (12) for controlled feed of the chain (C) on said guide (11) comprise a centering and/or retaining abutment (12A) placed on the guide (11) upstream of the area of interaction (H) of said insertion units (15, 115), adapted to be reversibly inserted, when controlled, into a respective ring.

4. The machine according to one or more of the preceding claims, wherein said means (12) for controlled feed of the chain (C) on said guide (11) comprise an actuator (14) for movement in the direction of feed of the chain, comprising a gripper (13) adapted to clamp the chain (C) when controlled.

5. The machine according to claim 4, wherein said gripper (13) being provided downstream with respect to the area of insertion (H) of the ribbon (F) into the chain (C) with reference to the direction of feed of

the chain.

6. The machine according to claim 4 or 5, wherein said gripper (13) is adapted also to block said ribbon (F) on said chain (C), defining said means for blocking a part of the ribbon (F) on the chain (C).

7. The machine according to one or more of the preceding claims, wherein said guide (11) comprises a sliding and support surface (11A), and opposite lateral containment edges (11B).

8. The machine according to claim 7, wherein opposite lateral containment edges (11B) have an adjustable distance.

9. The machine according to one or more of the preceding claims, wherein said two insertion units (15, 115) are arranged on opposite sides with respect to said guide (11).

10. The machine according to claim 9, wherein said two insertion units (15, 115) are arranged symmetrically opposite with respect to the sliding and support surface (11A) of the chain on the guide (11).

11. The machine according to claims 2 and 9 or 10, wherein said pushers (16, 116) of said units are mutually aligned, or they translate with their operating ends along a same line.

12. The machine according to one or more of the preceding claims, wherein each said inserter (17A, 117A) is associated with a pair of movement actuators, a first actuator (17B, 117B) adapted to move the respective inserter according to an incident direction, and a second actuator (17C, 117C) adapted to move the respective inserter (17A, 117A) on said plane away from said guide.

13. The machine according to claim 12, wherein said first actuator (17B, 117B) is fixed to said second actuator (17C, 117C) so that this latter moves the assembly formed by the first actuator (17B, 117B) and by the related inserter (17A, 117A).

14. The machine according to at least claims 1 to 6, comprising an electronic control system that enables the following operations to be carried out repeatedly:

- moving of said centering abutment (12A) into a ring (A3) of the chain (C), to determine the correct position of the chain on the guide (11),
- closing of the gripper (13) to clamp chain (C) and ribbon (F), with ribbon facing the chain,
- moving of the first pusher (16) into the first ring (A1)of the chain, encountering the ribbon before entering the ring (A1), thus pushing the ribbon (F) into the first ring and forming an eyelet (S) on the opposite face (C2) to the face on which it entered the ring,
- moving of the first pusher (16) to exit from the first ring (A1) in the opposite direction to the direction from which it entered,
- moving of the first inserter (17A) into the eyelet (S) formed by the first pusher (16),
- moving of the first inserter (17A) away from guide (11) of the chain, increasing the dimension of the eyelet (S) until one end (F1) of the ribbon exits from said first ring (A1), or the ribbon is free from said first ring up to one end (F1) thereof and is facing the face (C2) of the chain opposite the face of insertion of the first pusher,
- moving of said centering abutment (12A) to exit from the respective ring (A3) of the chain,
- moving of said gripper (13) in the direction of feed of the chain, drawing therewith the chain by a step equal to one ring,
- moving of said centering abutment (12A) to enter a ring subsequent to the ring it entered previously,
- moving of the second pusher (116) into a second ring (A2) of the chain, subsequent to the first, encountering the ribbon before entering the ring, thus pushing the ribbon into the second ring (A2) and forming an eyelet on the opposite face to the face on which it entered the ring,
- moving of the second pusher (116) to exit from the second ring in the opposite direction to the direction from which it entered,
- moving of the second inserter (117A) into the eyelet (S) formed by the second pusher (116),
- moving of the second inserter (117A) away from the guide (11)of the chain, increasing the dimension of the eyelet until one end (F1) of the ribbon exits from said second ring (A2), or the ribbon is free from said second ring up to one end thereof and is facing the face of the chain opposite the face of insertion of the second pusher (116).

15. The machine according to claim 14, wherein said gripper (13), after having been moved forward by one step is opened and releases the chain and the ribbon (F), and then moved back by one step and closed again to clamp chain (C) and ribbon (F).

Patentansprüche

1. Maschine (10) zum Einführen eines Bandes (F) in das Innere der Ringe (A) einer Kette (C) entsprechend einer wellenförmigen Tendenz mit

- einer Schiebeführung (11) für die Kette (C),
- einer Einrichtung (12) zur gesteuerten Förde-

rung der Kette (C) auf der Führung (11),
- einer Einrichtung (13) zum Blockieren eines Teils des Bandes (F) an der Kette (C), wobei das Band längs zu mindestens einem Teil einer ersten Fläche (C1) der Kette (C) zugewandt ist, sodass ein Ende des Bandes (F) entgegen der Richtung der Förderung der Kette (C) frei ist,
- einer ersten Einschubeinheit (15), die ausgebildet ist, um einen Teil des Bandes (F) in einen ersten Ring (A1) der Kette (C), dem es zugewandt ist, zu schieben, um eine vergrößernde Öse oder Schleife (S) an der gegenüberliegenden Fläche des ersten Rings (A1) mit Bezug auf das Einführen zu bilden, wobei die erste Einschubeinheit (15) ausgebildet ist, zu arbeiten, bis das freie Ende des Bandes (L) durch den ersten Ring (A1) passiert, wobei es die zweite Fläche (C2) der Kette (C) erreicht,
- einer zweiten Einschubeinheit (115), die ausgebildet ist, einen Teil des Bandes (F), der durch den ersten Ring (A1) passiert ist, in einer zweiten Richtung entgegengesetzt der ersten Richtung zu schieben, um eine vergrößernde Öse oder Schleife an der gegenüberliegenden Fläche des zweiten Rings (A2) mit Bezug auf das Einführen in den zweiten Ring (A2) zu bilden, wobei die zweite Einschubeinheit (15) ausgebildet ist, um zu arbeiten, bis das freie Ende des Bandes (F) durch den zweiten Ring (A2) passiert, wobei es zu der ersten Fläche (C1) der Kette (C) zurückkehrt.

2. Maschine nach Anspruch 1, wobei jede Einschubeinheit (15, 115) aufweist

- einen Schieber (16, 116) der ausgebildet ist, um eines seiner Enden in einer entsprechenden Einfallsrichtung zu einer jeweiligen Fläche (C1, C2) der Kette (C) durch einen jeweiligen Ring (A1, A2) zu bewegen, um den Teil des Bandes (F), der dem jeweiligen Ring zugewandt ist, in denselben Ring zu schieben, um auf der gegenüberliegenden Fläche die vergrößernde Öse oder Schleife zu bilden,
- eine Entfernungsvorrichtung (17, 117) mit einer ersten Einführungseinrichtung (17A, 117A), die aus einer Bereitschaftsposition in eine Position bewegbar ist, die in die vergrößerte Öse eingebracht ist, und anschließend in einer Richtung weg von der Schiebeführung (11) bewegbar ist, wodurch damit der Teil des Bandes, der noch nicht in die folgenden Ringe eingefügt ist, gezogen wird, sodass die Öse vergrößert wird, bis das freie Ende des Bandes durch den Ring passiert.

3. Maschine nach einem oder mehreren der vorstehenden Ansprüche, wobei die Einrichtung (12) zur gesteuerten Förderung der Kette (C) auf der Führung (11) einen zentrierenden und/oder haltenden Anschlag (12A) aufweist, der auf der Führung (11) stromauf des Bereichs der Zusammenwirkung (H) der Einschubeinheiten (15, 115) angeordnet ist, der ausgebildet ist, wenn er gesteuert wird, um reversibel in einen jeweiligen Ring eingebracht zu werden.

4. Maschine nach einem oder mehreren der vorstehenden Ansprüche, wobei die Einrichtung (12) zur gesteuerten Förderung der Kette (C) auf der Führung (11) einen Aktuator (14) für eine Bewegung in der Richtung der Förderung der Kette aufweist, mit einem Greifer (13), der ausgebildet ist, um die Kette (C) zu klemmen, wenn er gesteuert wird.

5. Maschine nach Anspruch 4, wobei der Greifer (13) stromab mit Bezug auf den Bereich der Einführung (H) des Bandes (F) in die Kette (C) mit Bezug auf die Richtung der Förderung der Kette vorgesehen ist.

6. Maschine nach Anspruch 4 oder 5, wobei der Greifer (13) ausgebildet ist, um das Band (F) an der Kette (C) zu blockieren, wodurch die Einrichtung zum Blockieren eines Teils des Bandes (F) auf der Kette (C) gebildet wird.

7. Maschine nach einem oder mehreren der vorstehenden Ansprüche, wobei die Führung (11) eine Gleit- und Trägerfläche (11A) und seitlich gegenüberliegende Einschlusskanten (11B) aufweist.

8. Maschine nach Anspruch 7, wobei die gegenüberliegenden seitlichen Einschlusskanten (11B) einen einstellbaren Abstand aufweisen.

9. Maschine nach einem oder mehreren der vorstehenden Ansprüche, wobei die beiden Einschubeinheiten (15, 115) an entgegengesetzten Seiten mit Bezug auf die Führung (11) angeordnet sind.

10. Maschine nach Anspruch 9, wobei die beiden Einschubeinheiten (15, 115) symmetrisch gegenüber mit Bezug auf die Gleit- und Trägerfläche (11A) der Kette auf der Führung (11) angeordnet sind.

11. Maschine nach Anspruch 2 und 9 oder 10, wobei die Schieber (16, 116) der Einheiten gegenseitig ausgerichtet sind oder sie sich mit ihren Arbeitsenden entlang derselben Linie bewegen.

12. Maschine nach einem oder mehreren der vorstehenden Ansprüche, wobei jede Einführungseinrichtung (17A, 117A) einem Paar von Bewegungsaktuatoren zugeordnet sind, einem ersten Aktuator (17B, 117B), der ausgebildet ist, um die jeweilige Einführungseinrichtung entsprechend einer Einfallsrichtung zu be-

wegen, und einem zweiten Aktuator (17C, 117C), der ausgebildet ist, um die jeweilige Einführungseinrichtung (17A, 117A) auf der Ebene weg von der Führung zu bewegen.

13. Maschine nach Anspruch 12, wobei der erste Aktuator (17B, 117B) an dem zweiten Aktuator (17C, 117C) fixiert ist, sodass der Letztere die Anordnung, die durch den ersten Aktuator (17B, 117B) und durch die zugeordnete Einführungseinrichtung (17A, 117A) gebildet ist, bewegt.

14. Maschine nach mindestens den Ansprüchen 1 bis 6 mit einem elektronischen Steuersystem, das es ermöglicht, dass die folgenden Vorgänge wiederholt durchgeführt werden können:

- Bewegen des Zentrieranschlags (12A) in einen Ring (A3) der Kette (C), um die korrekte Position der Kette an der Führung (11) zu bestimmen,
- Schließen des Greifers (13) zum Klemmen der Kette (C) und des Bandes (F), wobei das Band der Kette zugewandt ist,
- Bewegen des ersten Schiebers (16) in den ersten Ring (A1) der Kette, wobei das Band vor dem Eintritt in den Ring (A1) eingeschlossen wird, wodurch das Band (F) in den ersten Ring geschoben wird und eine Öse (S) an der gegenüberliegenden Fläche (C2) zu der Fläche, an der es in den Ring eingetreten ist, gebildet wird,
- Bewegen des ersten Schiebers (16) zum Austritt aus dem ersten Ring (A1) in der gegenüberliegenden Richtung zu der Richtung, in der er eingetreten ist,
- Bewegen der ersten Einführungseinrichtung (17A) in die Öse (S), die durch den ersten Schieber (16) gebildet wurde,
- Bewegen der ersten Einführungseinrichtung (17A) weg von der Führung (11) der Kette, wodurch die Abmessung der Öse (S) vergrößert wird, bis ein Ende (F1) des Bandes aus dem ersten Ring (A1) austritt oder das Band bis zu seinem einen Ende (F1) von dem ersten Ring frei ist und der Fläche (C2) der Kette gegenüber der Fläche der Einbringung des ersten Schiebers zugewandt ist,
- Bewegen des Zentrieranschlags (12A) zum Austritt aus dem jeweiligen Ring (A3) der Kette,
- Bewegen des Greifers (13) in der Richtung der Förderung der Kette, wodurch die Kette um einen Schritt entsprechend einem Ring gezogen wird,
- Bewegen des Zentrieranschlags (12A) zum Eintritt in einen Ring, der dem Ring folgt, in den er vorher eingetreten ist,
- Bewegen des zweiten Schiebers (116) in einen zweiten Ring (A2) der Kette, der dem ersten folgt, wodurch das Band eingeschlossen wird, bevor es in den Ring eintritt, wodurch das Band in den zweiten Ring (A2) geschoben wird und eine Öse auf der gegenüberliegenden Fläche zu der Fläche gebildet wird, in der es in den Ring eingetreten ist,
- Bewegen der zweiten Einführungseinrichtung (117A) in die Öse (S), die durch den zweiten Schieber (116) gebildet wurde,
- Bewegen der zweiten Einführungseinrichtung 117A) weg von der Führung (11) der Kette, Vergrößern der Abmessung der Öse bis ein Ende (F1) des Bandes aus dem zweiten Ring (A2) austritt oder das Band von dem zweiten Ring bis zu seinem Ende frei ist und der Fläche der Kette gegenüber der Fläche der Einbringung des zweiten Schiebers (116) zugewandt ist.

15. Maschine nach Anspruch 14, wobei der Greifer (13) nachdem er um einen Schritt vorwärts bewegt wurde geöffnet wird und die Kette und das Band (F) freigibt und dann um einen Schritt zurück bewegt wird und erneut geschlossen wird, um die Kette (C) und das Band (F) zu klemmen.

Revendications

1. Une machine (10) pour introduire un ruban (F) à l'intérieur des maillons (A) d'une chaîne (C) suivant une tendance non ondulée, comprenant

- un guide de coulissement (11) pour la chaîne (C) ;
- des moyens (12) pour l'avancement commandé de la chaîne (C) sur ledit guide (11) ;
- des moyens (13) pour bloquer une partie du ruban (F) sur la chaîne (C), ledit ruban faisant face longitudinalement au moins partiellement à une première face (C1) de ladite chaîne (C), de sorte qu'une extrémité dudit ruban (F), opposée à la direction d'avancement de la chaîne (C) soit libre ;
- une première unité d'insertion (15) apte à pousser, dans une première direction, une partie du ruban (F) dans un premier maillon (A1) de la chaîne (C) qui lui fait face, pour former un œillet ou une boucle (S) croissant(e), sur la face opposée du premier maillon (A1) par apport à celle de l'insertion, ladite première unité d'insertion (15) étant apte à agir jusqu'à ce que l'extrémité libre du ruban (L) passe à travers ledit premier maillon (A1), atteignant la deuxième face (C2) de la chaîne (C) ;
- une deuxième unité d'insertion (115) apte à pousser, dans une deuxième direction opposée à ladite première direction, la partie du ruban (F) qui est passée à travers ledit premier maillon (A1) dans un deuxième maillon (A2) pour former

un œillet ou une boucle croissant(e), sur la face opposée dudit deuxième maillon (A2) par rapport à celle de l'insertion dans le deuxième maillon (A2), ladite deuxième unité d'insertion (15) étant apte à agir jusqu'à ce que l'extrémité libre du ruban (F) passe à travers ledit deuxième anneau (A2), en retournant à la première face (C1) de la chaîne (C).

2. La machine selon la revendication 1, dans laquelle chaque unité d'insertion (15, 115) comprend :

- un poussoir (16, 116) apte à déplacer une de ses extrémités dans une direction incidente par rapport à une face respective (C1, C2) de la chaîne (C), à travers un maillon respectif (A1, A2) pour pousser la partie du ruban (F) faisant face au maillon respectif dans ce maillon afin de former sur la face opposée ledit œillet ou ladite boucle croissant(e),
- un dispositif de retrait (17, 117) ayant un premier organe d'insertion (17A, 117A) déplaçable d'une position d'attente à une position d'insertion dans l'œillet croissant et ensuite déplaçable dans une direction s'éloignant dudit guide de coulissement (11), en tirant avec lui la partie du ruban non encore insérée dans les maillons suivants, de sorte que ledit œillet soit agrandi jusqu'à ce que l'extrémité libre du ruban passe à travers ledit maillon.

3. La machine selon l'une ou plusieurs des revendications précédentes, dans laquelle lesdits moyens (12) pour l'avancement commandé de la chaîne (C) sur ledit guide (11) comprennent une butée de centrage et/ou de retenue (12A) placée sur le guide (11), en amont de la zone d'interaction (H) desdites unités d'insertion (15, 115), apte à être insérée de manière réversible, sur commande, dans un maillon respectif.

4. La machine selon l'une ou plusieurs des revendications précédentes, dans laquelle lesdits moyens (12) pour l'avancement commandé de la chaîne (C) sur ledit guide (11) comprennent un actionneur (14) pour le déplacement dans la direction d'avancement de la chaîne, comprenant une pince (13) apte à serrer la chaîne (C) sur commande.

5. La machine selon la revendication 4, dans laquelle ladite pince (13) est pourvue en aval par rapport à la zone d'insertion (H) du ruban (F) dans la chaîne (C) en se référant à la direction d'avancement de la chaîne.

6. La machine selon la revendication 4 ou 5, dans laquelle ladite pince (13) est apte à bloquer également ledit ruban (F) sur ladite chaîne (C), formant lesdits moyens pour bloquer une partie du ruban (F) sur la chaîne (C).

7. La machine selon l'une ou plusieurs des revendications précédentes, dans laquelle ledit guide (11) comprend une surface de coulissement et de support (11A) et des bords de retenue latérale opposés (11B).

8. La machine selon la revendication 7, dans laquelle les bords de retenue latérale opposés (11B) ont une distance réglable.

9. La machine selon l'une ou plusieurs des revendications précédentes, dans laquelle lesdites deux unités d'insertion (15, 115) sont agencées sur des côtés opposés par rapport audit guide (11).

10. La machine selon la revendication 9, dans laquelle lesdites deux unités d'insertion (15, 115) sont agencées de manière symétriquement opposée par rapport à la surface de coulissement et de support (11A) de la chaîne sur le guide (11).

11. La machine selon les revendications 2 et 9 ou 10, dans laquelle lesdits poussoirs (16, 116) desdites unités sont alignés l'un par rapport à l'autre, ou ils se meuvent avec leurs extrémités fonctionnelles le long d'une même ligne.

12. La machine selon l'une ou plusieurs des revendications précédentes, dans laquelle chaque organe d'insertion (17A, 117A) est associé avec une paire d'actionneurs de mouvement, un premier actionneur (17B, 117B) apte à déplacer l'organe d'insertion respectif suivant une direction incidente et un deuxième actionneur (17C, 117C) apte à éloigner l'organe d'insertion respectif (17A, 117A) dudit guide sur le même plan.

13. La machine selon la revendication 12, dans laquelle ledit premier actionneur (17B, 117B) est fixé audit deuxième actionneur (17C, 117C) de sorte que ce dernier déplace l'ensemble formé par le premier actionneur (17B, 117B) et l'organe d'insertion associé (17A, 117A).

14. La machine selon les revendications 1 à 6 au moins, comprenant un système de commande électronique qui permet aux opérations suivantes d'être effectuées de manière répétitive :

- déplacement de ladite butée de centrage (12A) dans un maillon (A3) de la chaîne (C), pour déterminer la position correcte de la chaîne sur le guide (11),
- fermeture de la pince (13) pour serrer la chaîne (C) et le ruban (F), avec le ruban en face de la

chaîne,
- déplacement du premier poussoir (16) dans le premier maillon (A1) de la chaîne, rencontre du ruban avant d'entrer dans le maillon (A1), puis poussée du ruban (F) dans le premier maillon et formation d'un œillet (S) sur la face opposée (C2) à la face sur laquelle par laquelle il est entré dans le maillon,
- déplacement du premier poussoir (16) pour le faire sortir du premier maillon (A1) dans la direction opposée à la direction dans laquelle il est entré,
- déplacement du premier organe d'insertion (17A) dans l'œillet (S) formé par le premier poussoir (16),
- éloignement du premier organe d'insertion (17A) du guide (11) de la chaîne, agrandissement de la dimension de l'œillet (S) jusqu'à ce qu'une extrémité (F1) du ruban sorte dudit premier maillon (A1), ou que le ruban soit libéré dudit premier maillon jusqu'à une extrémité (F1) de ce ruban et se trouve en face de la face (C2) de la chaîne opposée à la face d'insertion du premier poussoir,
- déplacement de ladite butée de centrage (12A) pour qu'elle sorte du maillon respectif (A3) de la chaîne,
- déplacement de ladite pince (13) dans la direction d'avancement de la chaîne, tirant avec elle la chaîne d'un pas égal à un maillon,
- déplacement de ladite butée de centrage (12A) pour qu'elle entre dans un maillon suivant le maillon dans lequel elle est entrée précédemment,
- déplacement du deuxième poussoir (116) dans un deuxième maillon (A2) de la chaîne, qui suit le premier, rencontre avec le ruban avant d'entrer dans le maillon, ensuite poussée du ruban dans le deuxième maillon (A2) et formation d'un œillet sur la face opposée à la face par laquelle il est entré dans le maillon,
- déplacement du deuxième poussoir (116) pour le faire sortir du deuxième maillon dans la direction opposée à la direction dans laquelle il est entré,
- déplacement du deuxième organe d'insertion (117A) dans l'œillet (S) formé par le deuxième poussoir (116),
- éloignement du deuxième organe d'insertion (117A) du guide (11) de la chaîne, agrandissement de la dimension de l'œillet jusqu'à ce qu'une extrémité (F1) du ruban sorte dudit deuxième maillon (A2), ou que le ruban soit libéré dudit deuxième maillon jusqu'à une extrémité de ce ruban et se trouve en face de la face de la chaîne opposée à la face d'insertion du deuxième poussoir (116).

15. La machine selon la revendication 14, dans laquelle ladite pince (13), après avoir été déplacée vers l'avant d'un pas, est ouverte et libère la chaîne et le ruban (F) et est ensuite reculée d'un pas et fermée à nouveau pour serrer la chaîne (C) et le ruban (F).

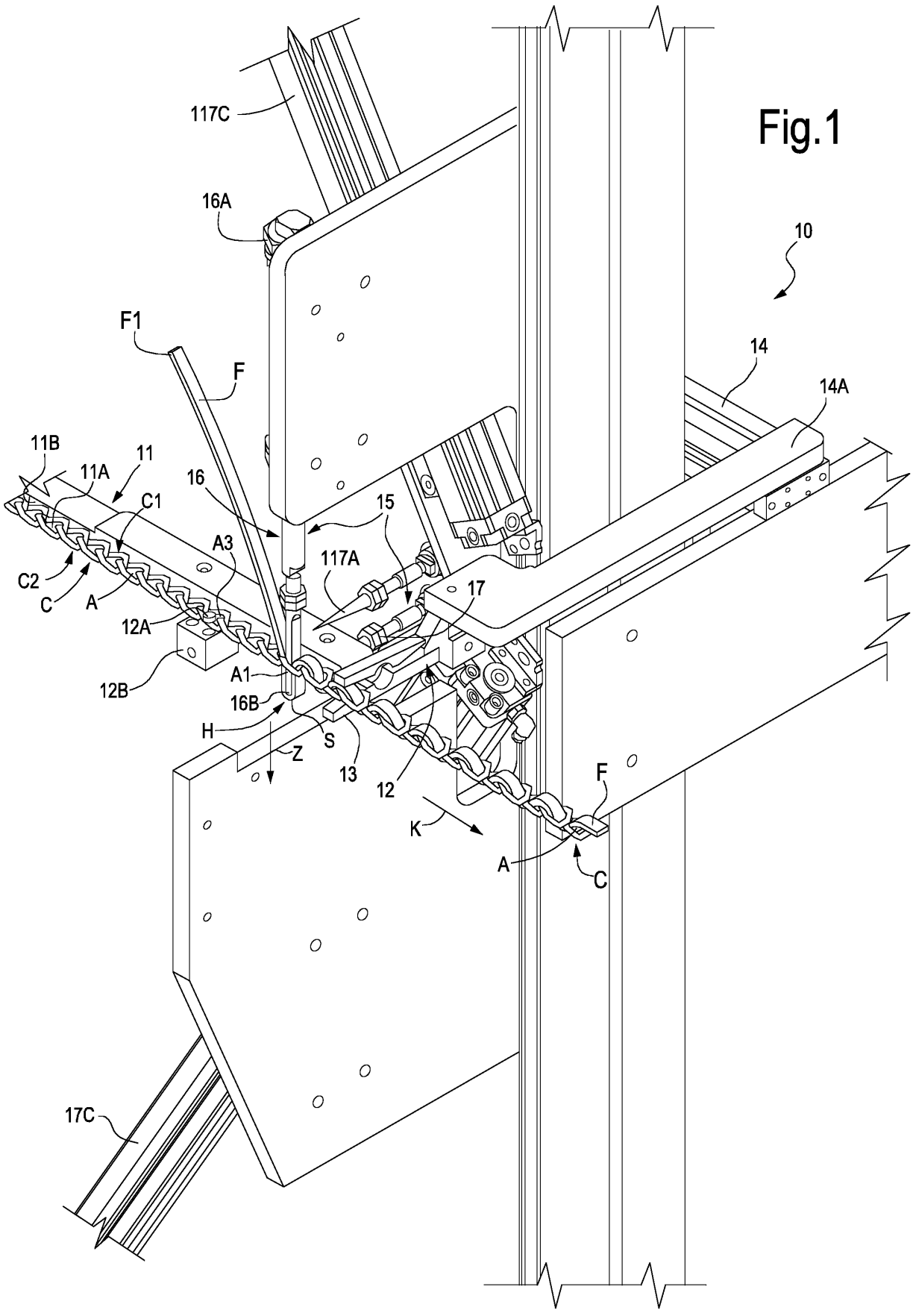
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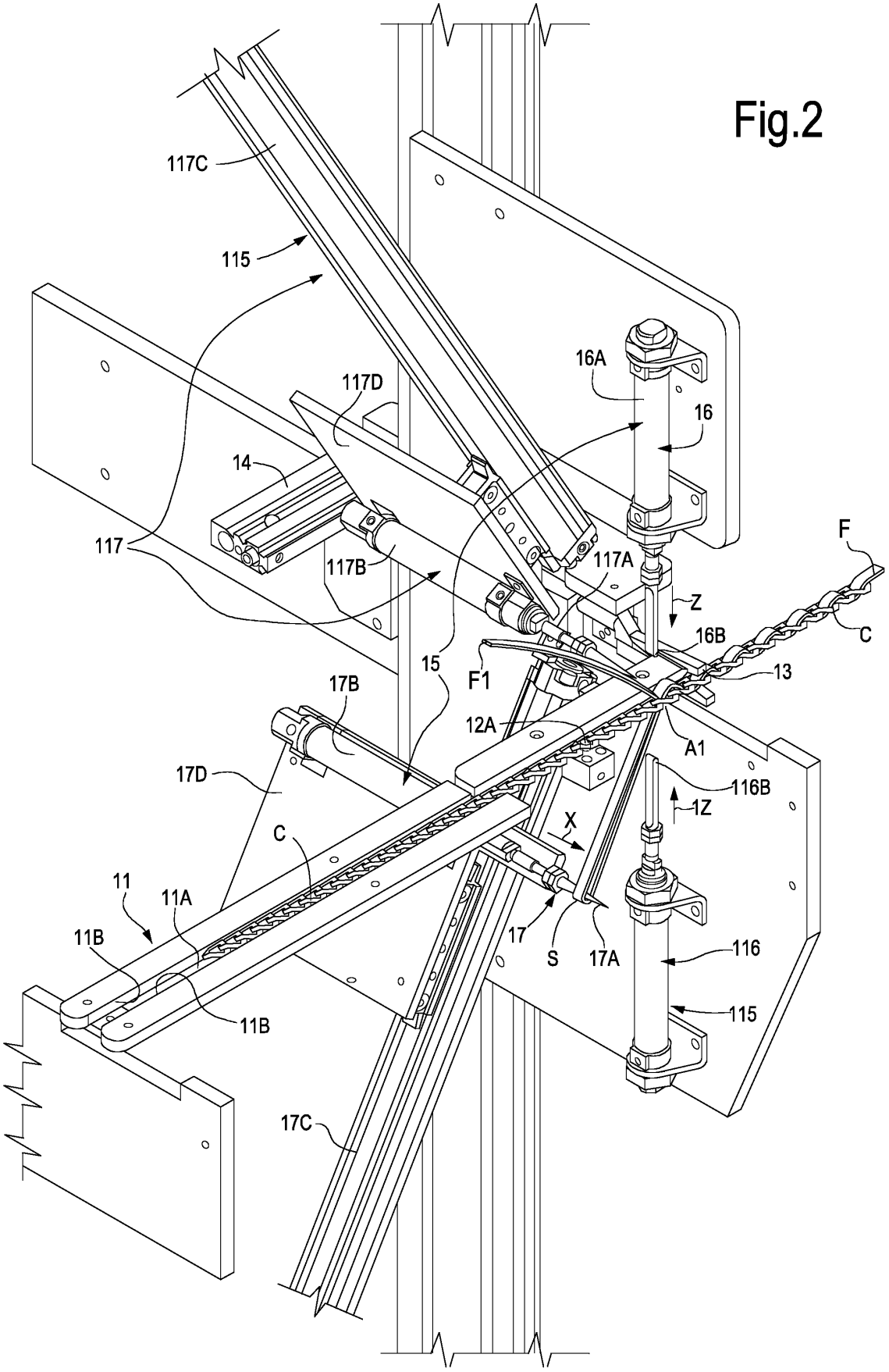
Fig.1

Fig.2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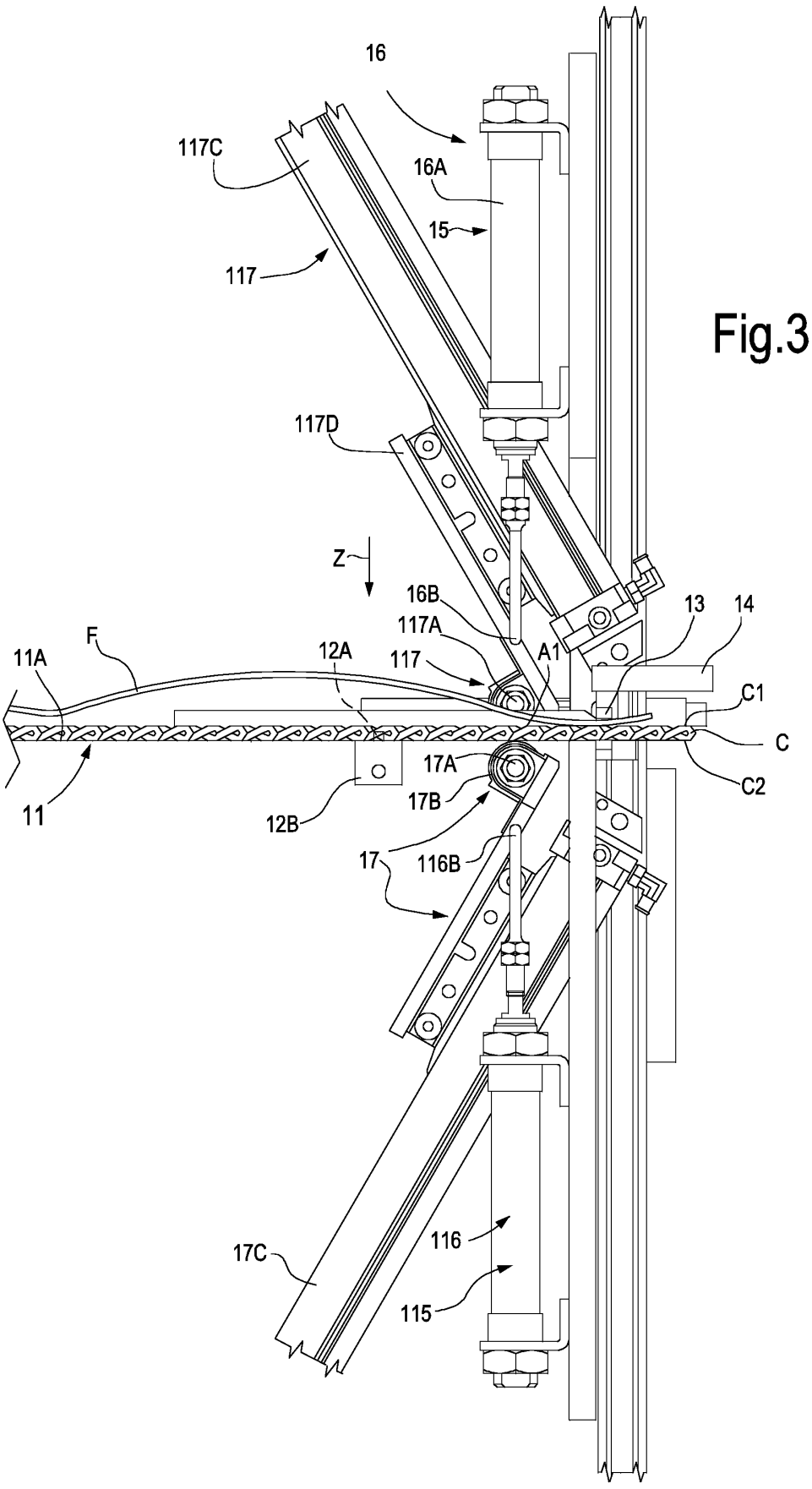
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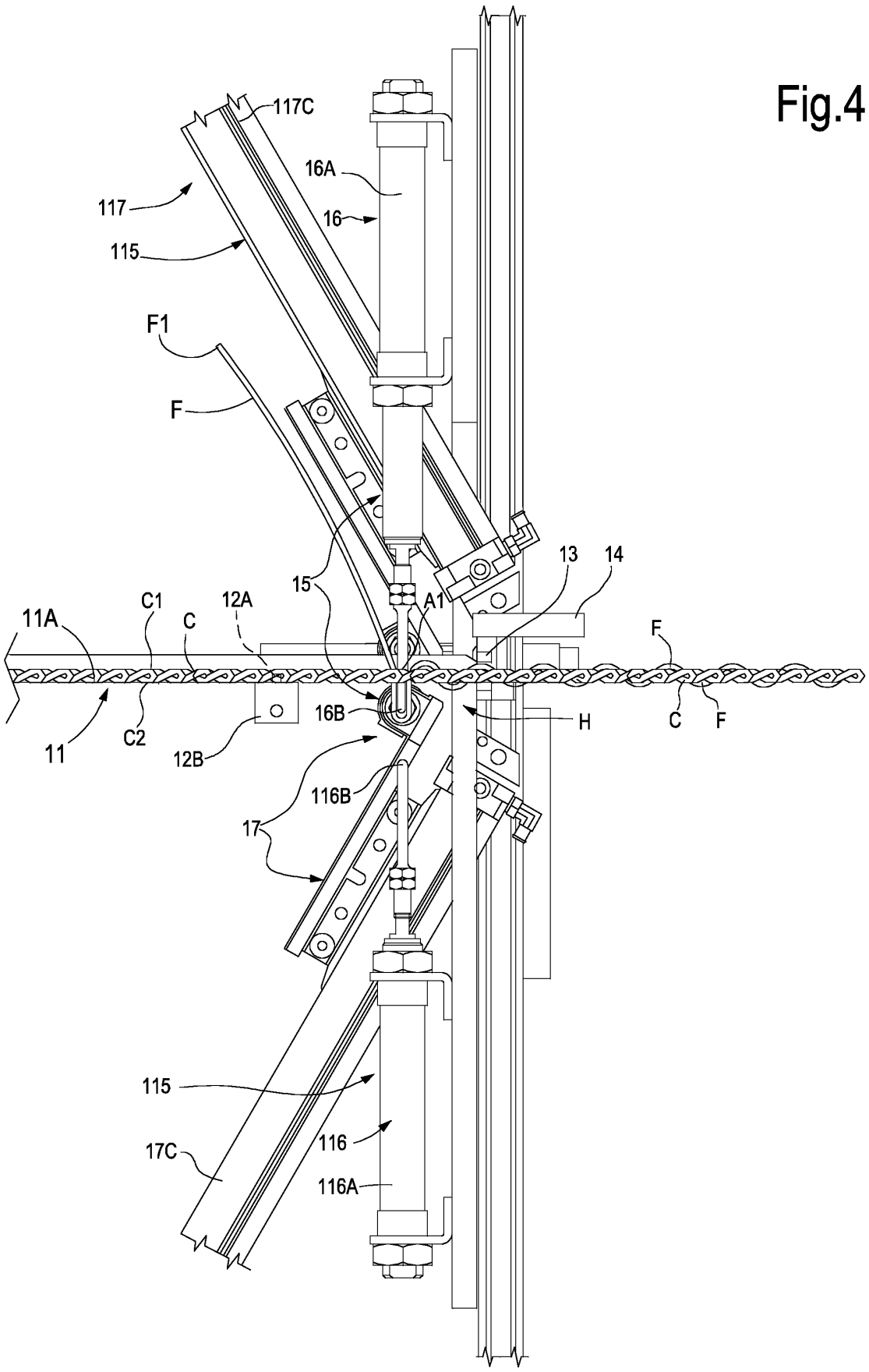
116
115

Fig.3

Fig.4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116A

Fig.5

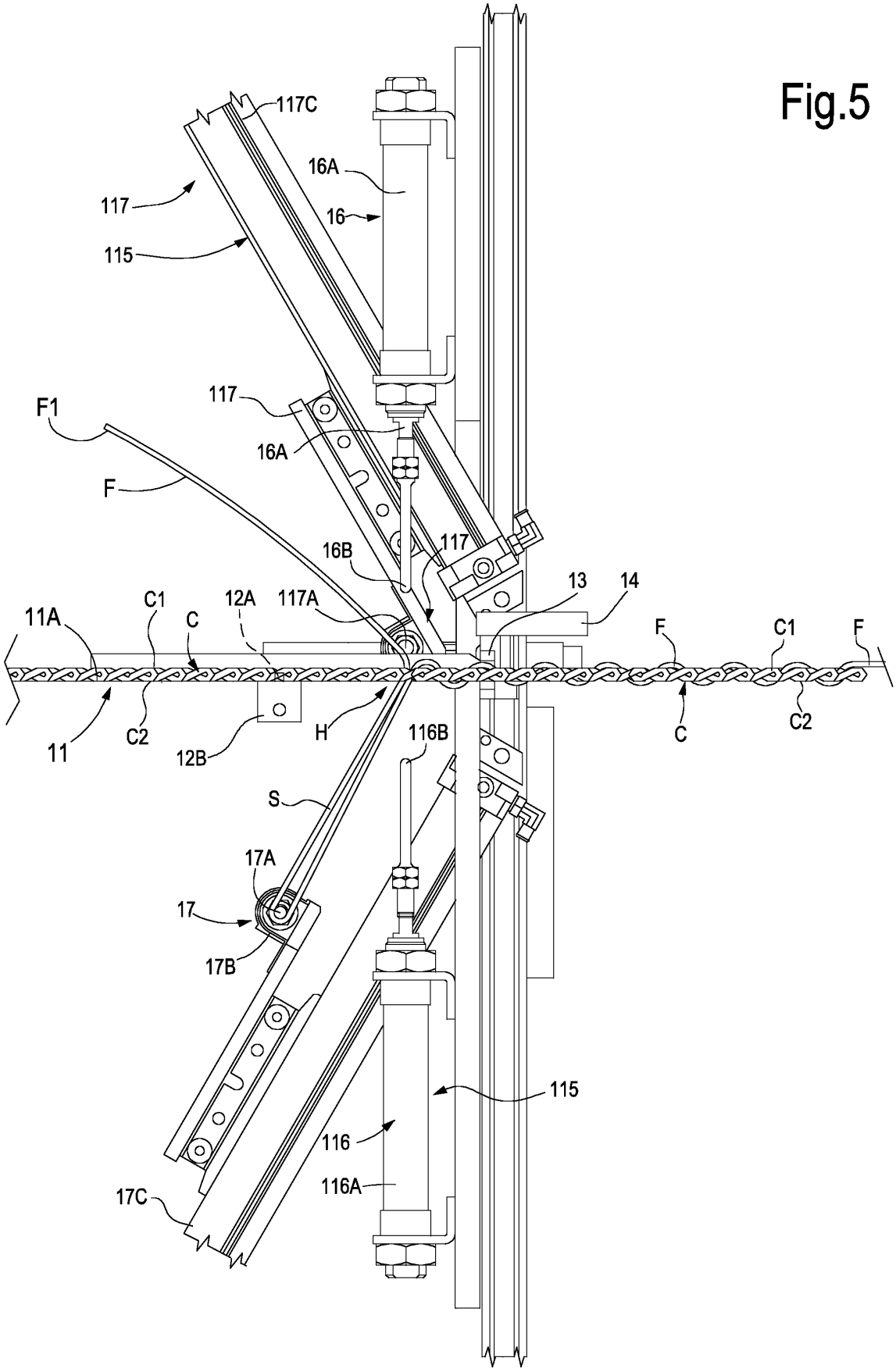
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Fig.6

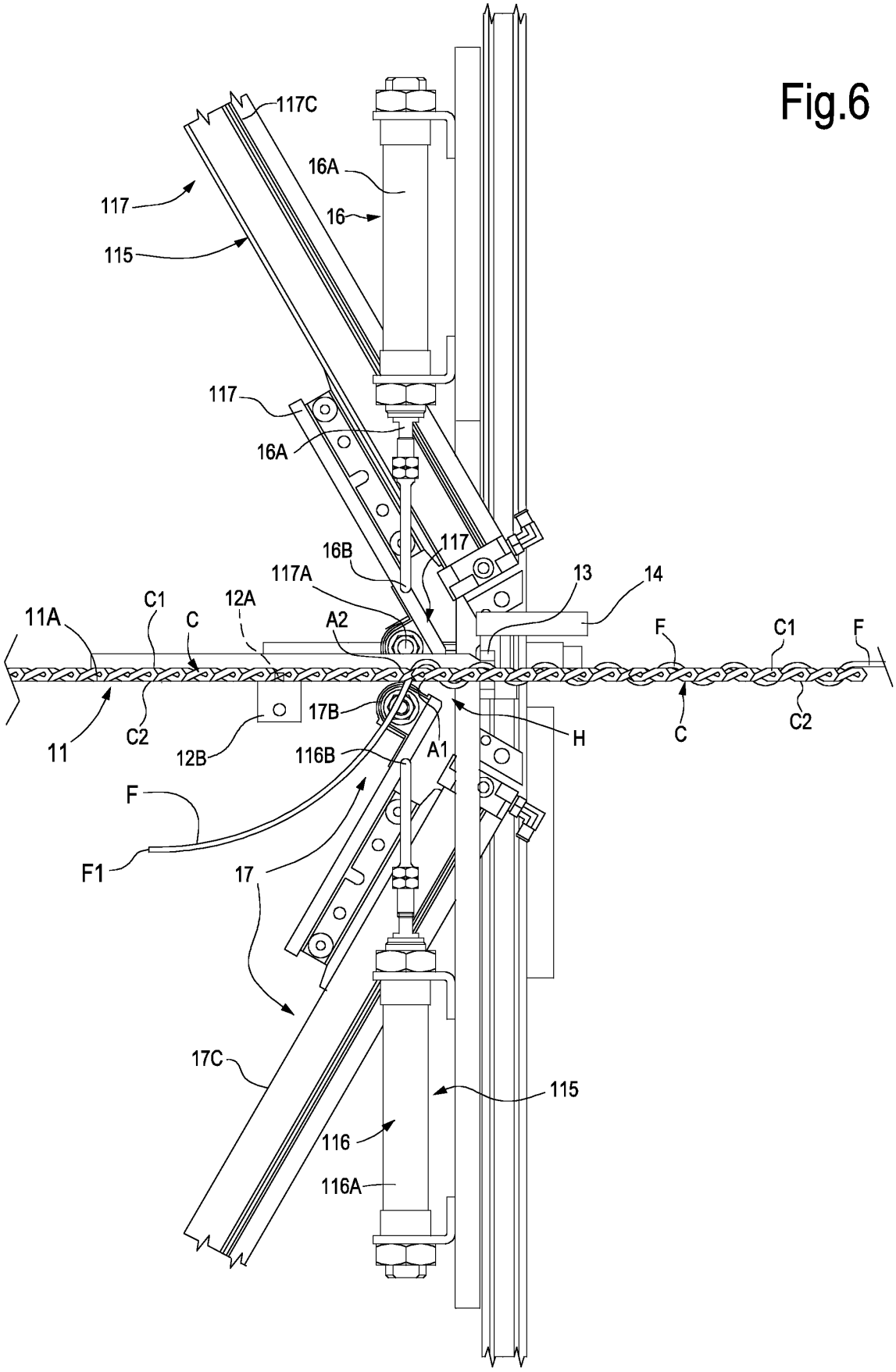
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Fig.7

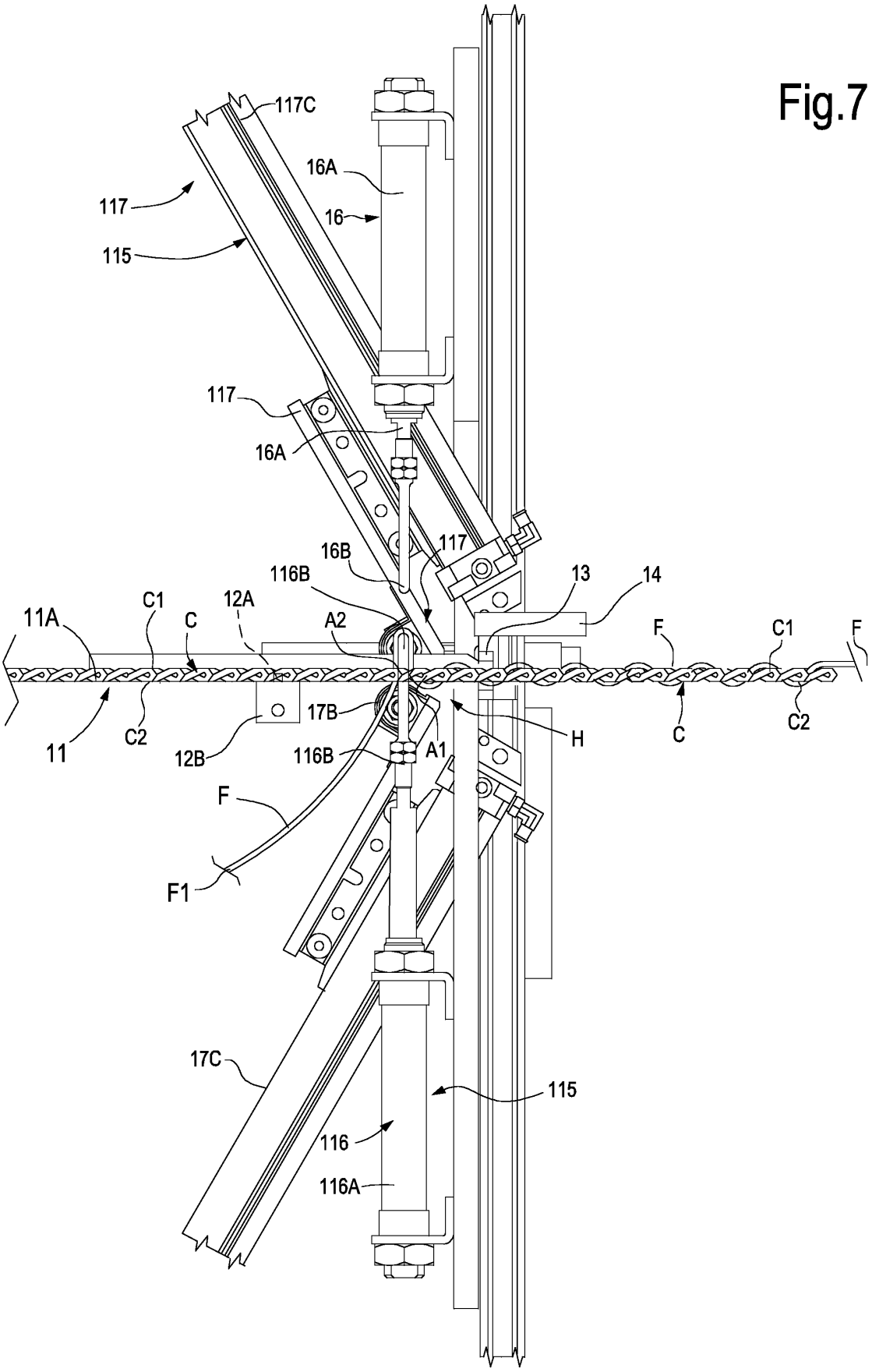
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Fig.8

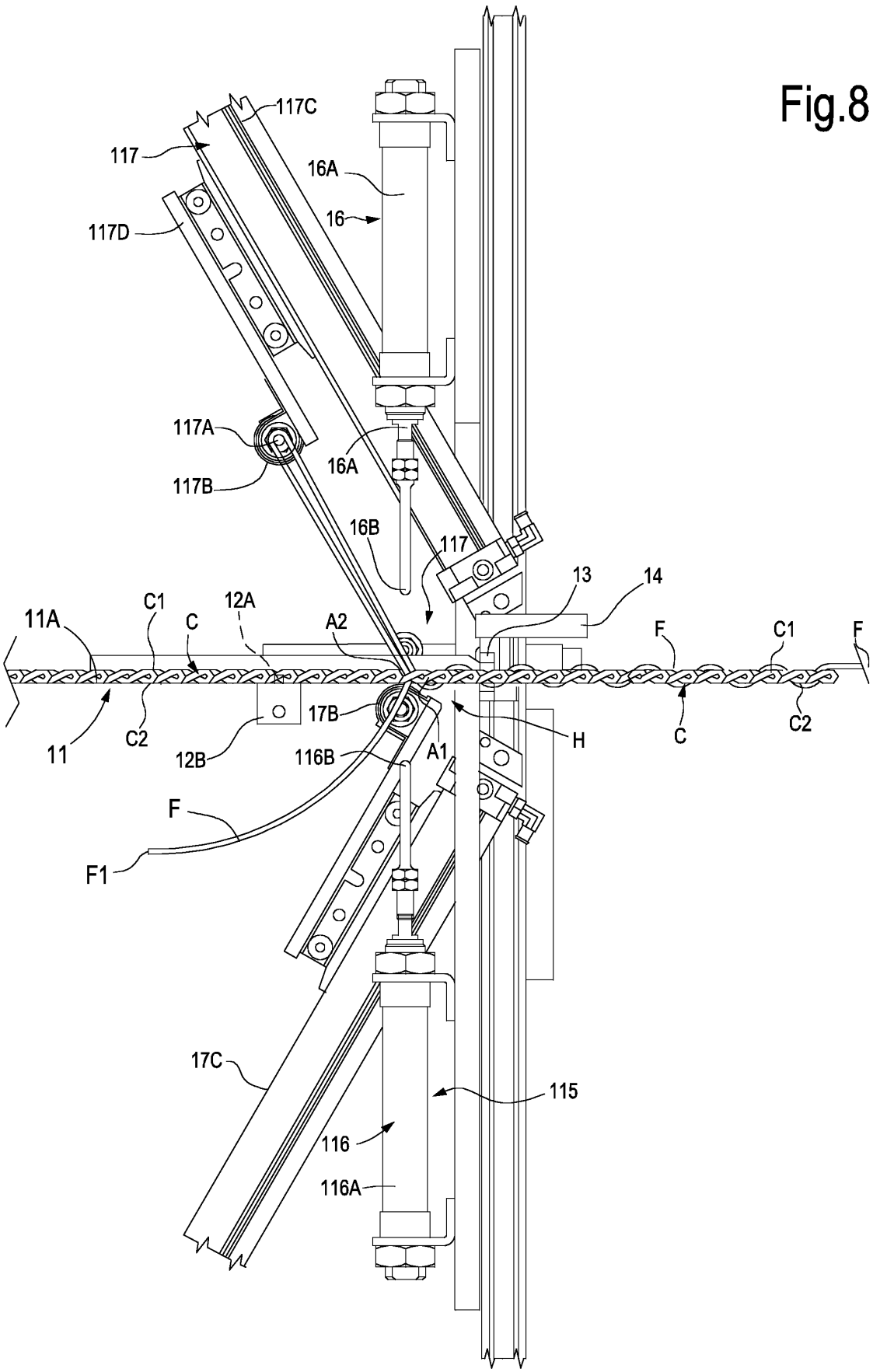
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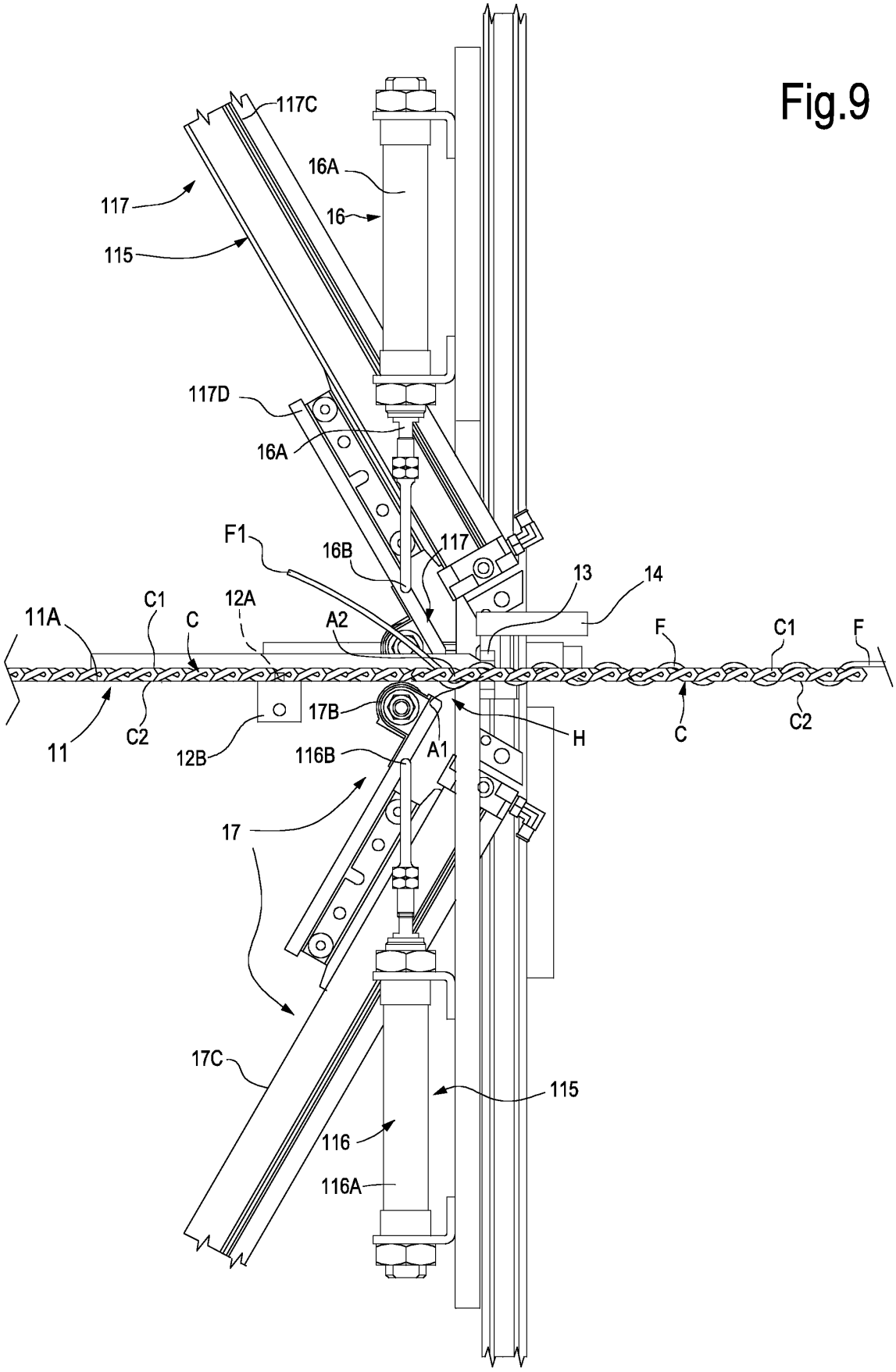
Fig.9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F
11
C2
12B
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116B
A1
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C2
17
17C
115
116
116A

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