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(54) **Device for moving a shuttle, for shuttle weaving machines**

Vorrichtung zum Antreiben des Schützens in einer Schützenwebmaschine

Dispositif pour mouvoir la navette dans un métier à tisser à navettes

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(73) Proprietor: **Officina Meccanica Trinca Colonel Silvio & Figlio Sergio S.n.c.**
22075 Lurate Caccivio (Prov. of Como) (IT)

(72) Inventor: **Trinca Colonel, Sergio**
22079 Villa Guardia (Prov. of Como) (IT)

(74) Representative: **Alagem Modiano, Lara S. et al Modiano & Associati**
Via Meravigli, 16
20123 Milano (IT)

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Description

[0001] The present invention relates to a device for moving a shuttle for shuttle weaving machines

[0002] As is known, weaving machines may be provided with a shuttle, i.e., a device adapted to support a weft thread spool, which is moved from one end to the other of the weaving machine, in order to transport the weft thread between the warp threads, in synchronism with the movement of the beater of the loom, for carrying out the weaving of the fabric.

[0003] The movement of the shuttle may be carried out with a launching from one end to the other of the weaving machine, however this brings about the drawback that the movement is not controlled in an exact manner, and moreover the travels from left to right and from right to left are not differently adjustable, i.e., they may only be the same.

[0004] Moreover, the conventional movement of the shuttle causes a considerable noise which strongly disturbs the operators who operate the weaving machine.

[0005] DE 370 135 C discloses a shuttle loom with shuttle control having a combination of structural features as set forth in the pre-characterizing portion of the appended claim 1.

[0006] The aim of the present invention is to provide a shuttle launching device, for shuttle weaving machines, in which the launch is carried out in a controlled manner from one end to the other of a weaving machine.

[0007] Within this aim, an object of the present invention is to provide a shuttle launching device which allows to control and adjust in an independent manner the travel strokes from one side to the other of the weaving machine.

[0008] Another object of the present invention is to provide a shuttle launching device which is extremely silent, thereby contributing to improve the qualities of the work environment.

[0009] A further object of the present invention is to provide a shuttle launching device which allows to maintain the movement of the shuttle always controlled in every moment.

[0010] Still another object of the present invention is to provide a shuttle launching device which is highly reliable, is relatively simple to manufacture, and at a competitive cost.

[0011] In accordance with the invention, there is provided a device for moving a shuttle, for shuttle weaving machines, as defined in the appended claims.

[0012] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the device according to the invention, illustrated only by way of non-limiting example in the accompanying drawings, in which:

Figure 1 is a front elevation view of the device according to the present invention;

Figures 2 to 9 schematically illustrate the various operative steps of the launching device according to the present invention.

[0013] With reference to the figures, the shuttle launching or movement device according to the invention, generally designated by the reference numeral 1, comprises, for each side of the weaving machine 2, a rod-shaped element 3, provided with a rack, adapted to engage pulling means, for example constituted by a toothed wheel 4, which is actuated by a servomotor 5.

[0014] The rod-shaped element 3 is provided with an end 6 adapted to engage in a seat 7 of a shuttle 8 which must be moved from one end to the other of the weaving machine 2. The shuttle advantageously supports a reel 9 of weft thread which must be inserted between the warp thread 10, in order to obtain the fabric.

[0015] In the figures the weft thread is indicated by the reference numeral 11.

[0016] Stop means, advantageously constituted by a pneumatic cylinder 12, are provided at each end of the weaving machine, for blocking the rotation of the reel 9, housed within the shuttle 8, and for also blocking the shuttle 8, so that the rod-shaped element 3 may release itself when the shuttle reaches the opposite end of the weaving machine, for being able to be engaged by the rod-shaped element 3 present at the same opposite end.

[0017] Substantially, the pneumatic cylinder 12 acts like a stop element which permits the rod-shaped element to disengage from the seat 7 of the shuttle 8, without pulling therewith, during its retroaction movement to the starting position, the shuttle 8 which must be instead engaged by the rod-shaped element present at that given end of the weaving machine.

[0018] Figures 2 to 9 illustrate the various steps of the sequence of movement of the shuttle.

[0019] In Figure 2 the shuttle 8 is engaged by the rod-shaped element 3 of the left side of the weaving machine, with the beater which is moved towards the bottom, facing the reader.

[0020] Figure 3 illustrates instead a second step in which the beater goes through a return movement, upwardly, facing the reader.

[0021] Figure 4 illustrates the step in which the shuttle is moved by the actuation of the toothed wheel 4, by means of the servomotor 5, at the left side of said weaving machine, and the rod-shaped element performs a translational motion along all of the width of the weaving machine, until the shuttle is brought to the right end of the same weaving machine.

[0022] At this point the pneumatic cylinder 22 blocks the spool 9 as well as the shuttle 8, preventing the undesired return of the shuttle, and therefore, see Figure 5, the rod-shaped element 3 of the left side retracts, while the right rod-shaped element 3 engages in turn the shuttle with the steps of Figures 6 to 9 which correspond therefore to the steps of Figures 2 to 5 for the movement of the right side.

[0023] Substantially, therefore, Figures 2 to 5 illustrate the movement of the shuttle from the left side to the right side while Figures 6 to 9 illustrate the movement of the shuttle in the opposite direction, i.e., from the right side to the left side.

[0024] In practice it has been observed that the device for moving or launching the shuttle according to the invention fully achieves the intended aim and objects, in that the movement may be controlled, programmed, and regulated in an independent manner for each side of the weaving machine with respect to the opposite side.

[0025] The constant control of the movement of the shuttle along its path both from left to right and from right to left allows to better keep the state of the weaving under control and obtain fabrics of improved quality.

[0026] Moreover, the movement by means of the rod-shaped rack element and the toothed wheel allows to nearly completely eliminate noise caused by the conventional movement of the shuttle. In fact, in the conventional "launching" of the shuttle, there always exists a striking element which strikes the shuttle to carry out the launch from one end to the other. Such striking inevitably brings about a noise and creates uneasiness in the work environment.

[0027] The device thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; moreover all the details may be substituted with other technically equivalent elements.

[0028] In practice, the materials employed as well as the dimensions and the contingent shapes may be any according to requirements and to the state of the art.

[0029] 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 device (1) for moving a shuttle (8), for shuttle weaving machines, comprising, at each side of a weaving machine, a rod-shaped element (3) provided with a rack, adapted to engage pulling means (4), said rod-shaped element (3) at each side of the weaving machine being adapted to engage in a respective end of a shuttle (8), for pushing said shuttle to the opposite side of said weaving machine, the device being **characterized in that** each one of said pulling means (4) is actuated by its own servomotor (5) independently of the actuation of the other pulling means (4) by its own servomotor (5) such that the movement of said shuttle (8) is controlled in an independent manner for each side of the weaving machine with respect to the opposite side, and the de-

vice further comprising means (12) for blocking said shuttle for allowing the disengagement of a rod-shaped element (3) when the opposite rod-shaped element (3) has engaged the end of the shuttle.

2. The device according to claim 1, **characterized in that** said pulling means (4) comprise a toothed wheel (4) actuated by a servomotor, said toothed wheel engaging the rack of said rod-shaped element (3).
3. The device according to claim 1, **characterized in that** said blocking means comprise a pneumatic cylinder (12) for each side of the weaving machine.
4. The device according to claim 3, **characterized in that** said shuttle (8) houses a spool (9) on which the weft thread is wound.
5. The device according to claim 4, **characterized in that** said pneumatic cylinder (12) is adapted to block the rotation of said spool (9) inside said shuttle (8) and to block said shuttle (8) for allowing the disengagement of the rod-shaped element (3) from said shuttle (8).

Patentansprüche

1. Vorrichtung (1) zum Bewegen eines Schützens (8) für Schützenwebmaschinen, die auf jeder Seite einer Webmaschine ein stabförmiges Element (3) umfasst, das mit einer Zahnung versehen ist und dazu ausgelegt ist, mit Zugmitteln (4) in Eingriff zu gelangen, wobei das stabförmige Element (3) auf jeder Seite der Webmaschine dazu ausgelegt ist, mit einem entsprechenden Ende eines Schützens (8) in Eingriff zu gelangen, um den Schützen zur gegenüberliegenden Seite der Webmaschine zu schieben, wobei die Vorrichtung **dadurch gekennzeichnet ist, dass** jedes der Zugmittel (4) durch seinen eigenen Servomotor (5) unabhängig von der Betätigung der anderen Zugmittel (4) durch ihren jeweils eigenen Servomotor (5) betätigt wird, so dass die Bewegung des Schützens (8) unabhängig für jede Seite der Webmaschine in Bezug auf die gegenüberliegende Seite gesteuert wird, und die Vorrichtung ferner Mittel (12) umfasst, um den Schützen zu blockieren, um die Lösung des Eingriffs eines stabförmigen Elements (3) zuzulassen, wenn das gegenüber befindliche stabförmige Element (3) mit dem Ende des Schützens in Eingriff gelangt ist.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Zugmittel (4) ein gezahntes Rad (4) umfassen, das durch einen Servomotor betätigt wird, wobei das gezahnte Rad mit der Zahnung des stabförmigen Elements (3) in Eingriff ist.

3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Blockiermittel einen Druckluftzylinder (12) für jede Seite der Webmaschine umfassen.
4. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** der Schützen (8) eine Spule (9) enthält, auf die der Webfaden gewickelt ist.
5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** der Druckluftzylinder (12) dazu ausgelegt ist, die Drehung der Spule (9) in dem Schützen (8) zu blockieren und den Schützen (8) zu blockieren, um ein Lösen des Eingriffs zwischen dem stabförmigen Element (3) und dem Schützen (8) zuzulassen.
5. Dispositif selon la revendication 4, **caractérisé en ce que** ledit cylindre pneumatique (12) est adapté pour bloquer la rotation de ladite bobine (9) à l'intérieur de ladite navette (8) et pour bloquer ladite navette (8) de façon à permettre la libération de la prise de l'élément en forme de tige (3) vis-à-vis de ladite navette (8).

Revendications

1. Dispositif (1) pour déplacer une navette (8), pour des métiers à tisser à navettes, comprenant, de chaque côté d'un métier à tisser, un élément en forme de tige (3) muni d'une crémaillère, adapté pour venir en prise avec des moyens de traction (4), ledit élément en forme de tige (3) de chaque côté du métier à tisser étant adapté pour venir en prise dans une extrémité respective d'une navette (8), pour pousser ladite navette vers le côté opposé dudit métier à tisser, le dispositif étant **caractérisé en ce que** chacun desdits moyens de traction (4) est actionné par son propre servo-moteur (5) indépendamment de l'actionnement de l'autre moyen de traction (4) par son propre servo-moteur (5), de telle sorte que le déplacement de ladite navette (8) soit commandé d'une façon indépendante pour chaque côté du métier à tisser par rapport au côté opposé, et le dispositif comprenant de plus des moyens (12) pour bloquer ladite navette pour permettre la libération de la prise d'un élément en forme de tige (3) lorsque l'élément en forme de tige opposé (3) est venu en prise avec l'extrémité de la navette.
2. Dispositif selon la revendication 1, **caractérisé en ce que** lesdits moyens de traction (4) comprennent une roue dentée (4) actionnée par un servomoteur, ladite roue dentée s'engrenant avec la crémaillère dudit élément en forme de tige (3).
3. Dispositif selon la revendication 1, **caractérisé en ce que** lesdits moyens de blocage comprennent un cylindre pneumatique (12) pour chaque côté du métier à tisser.
4. Dispositif selon la revendication 3, **caractérisé en ce que** ladite navette (8) renferme une bobine (9) sur laquelle est enroulé le fil de trame.

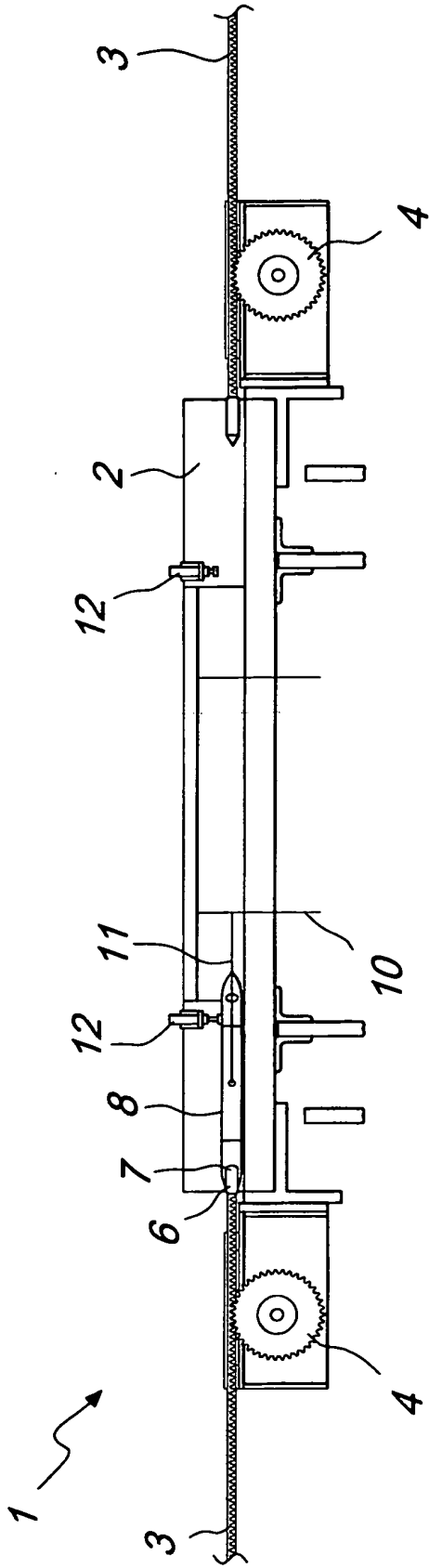


Fig. 1

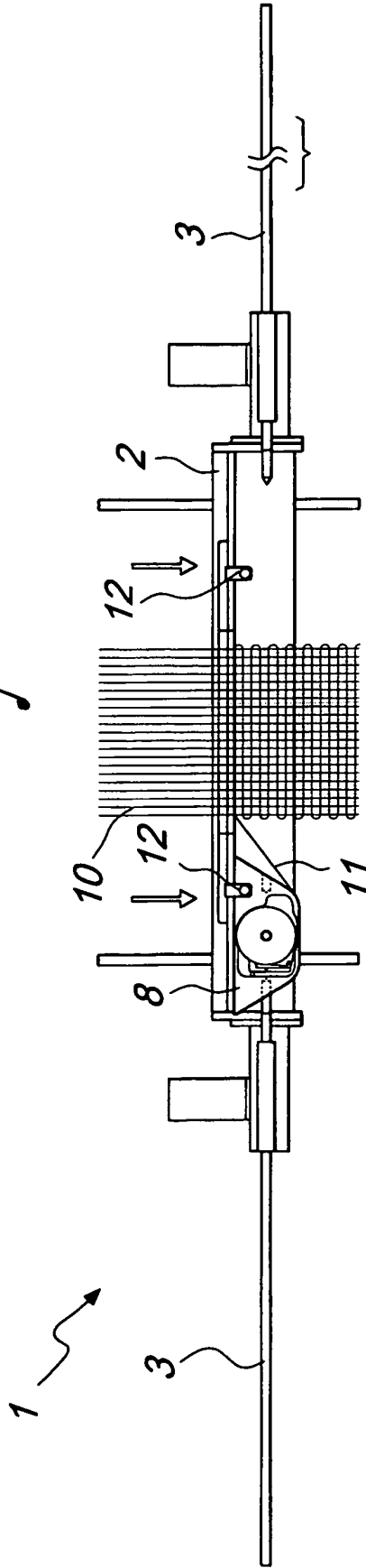
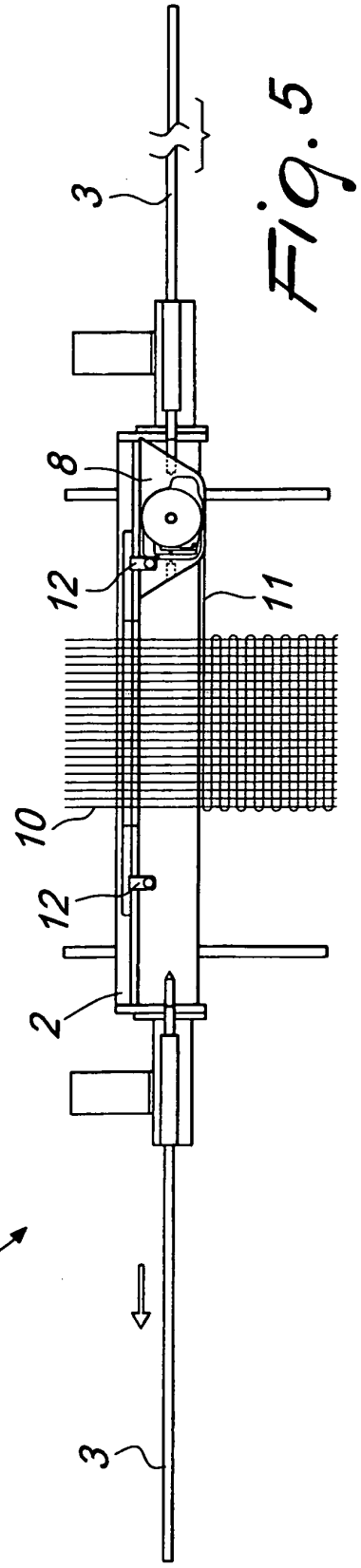
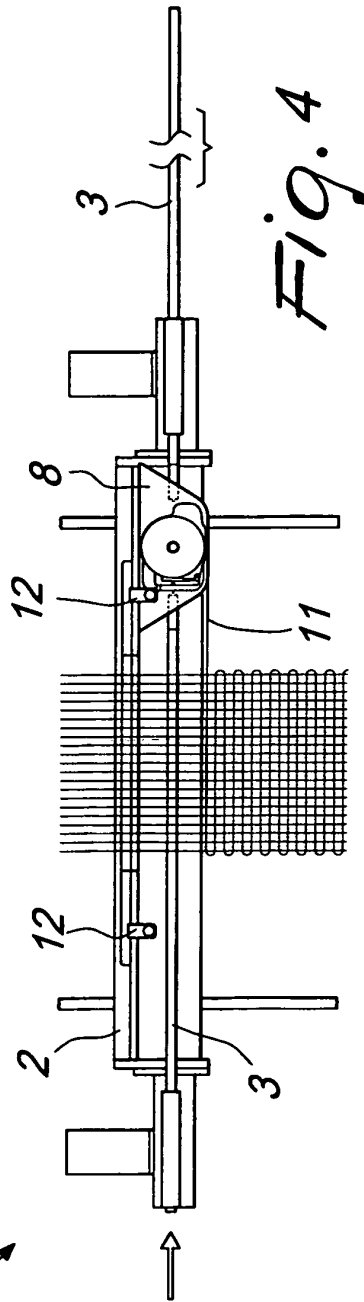
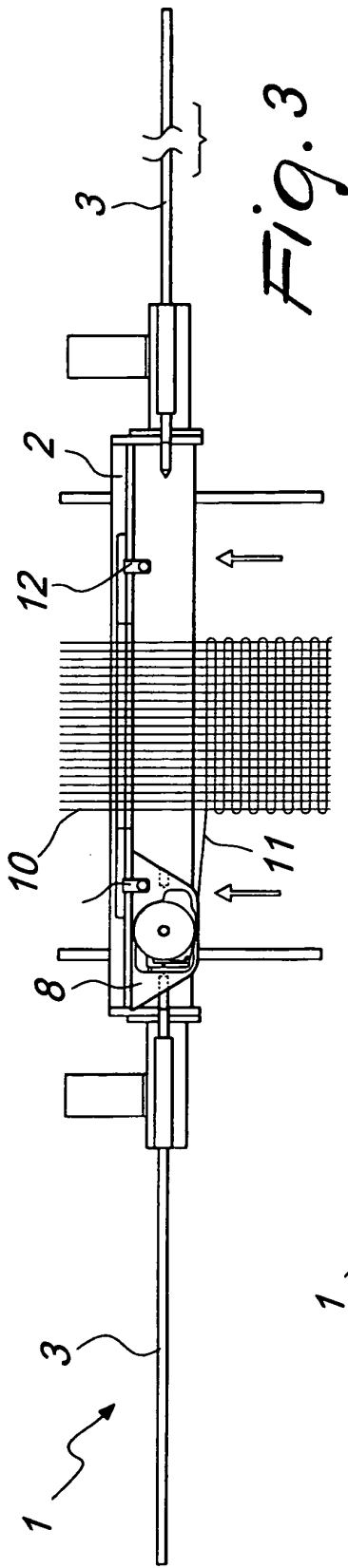
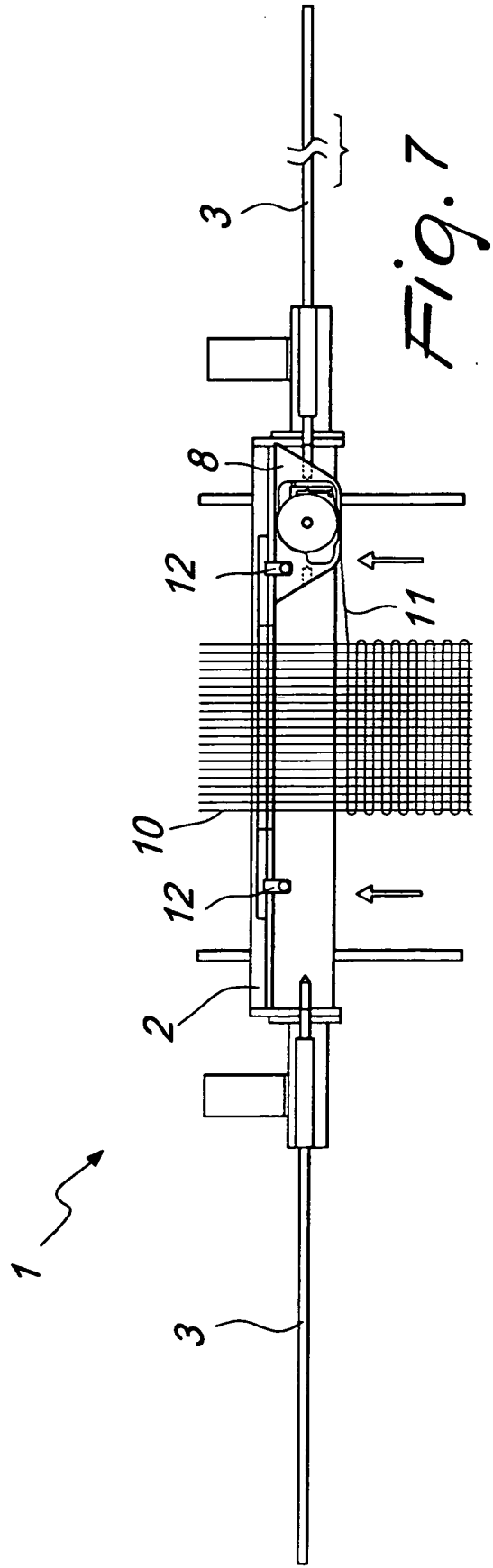
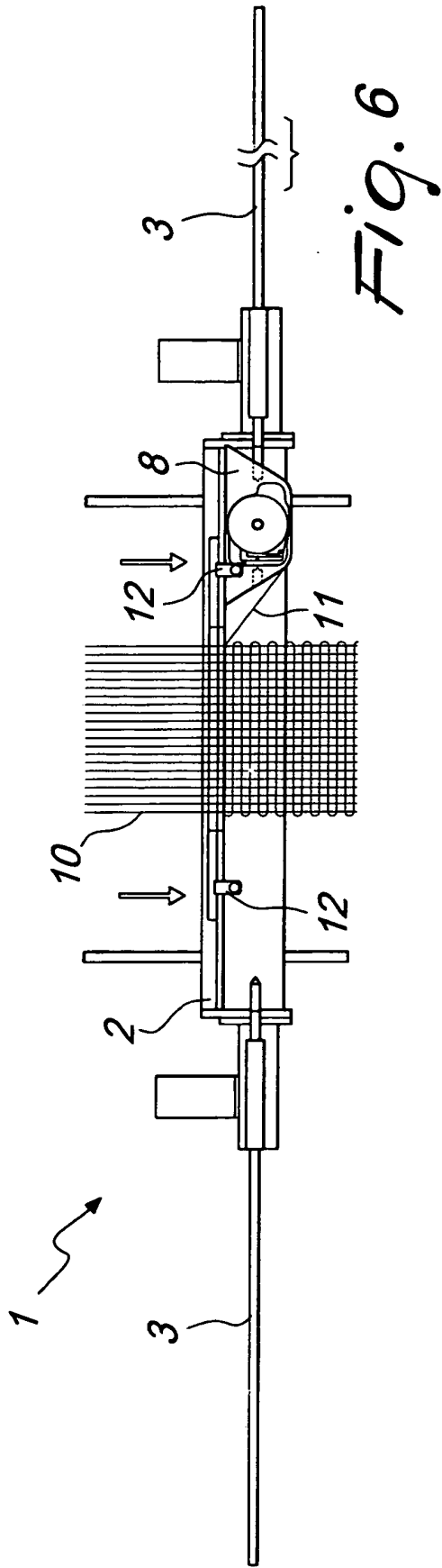
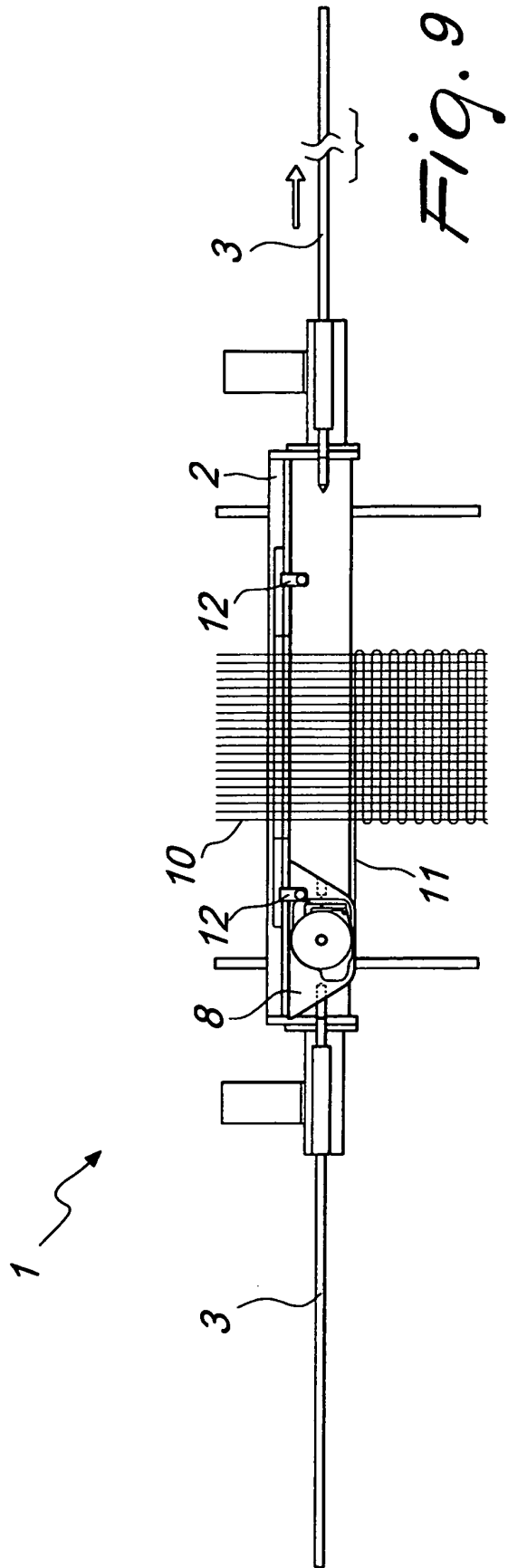
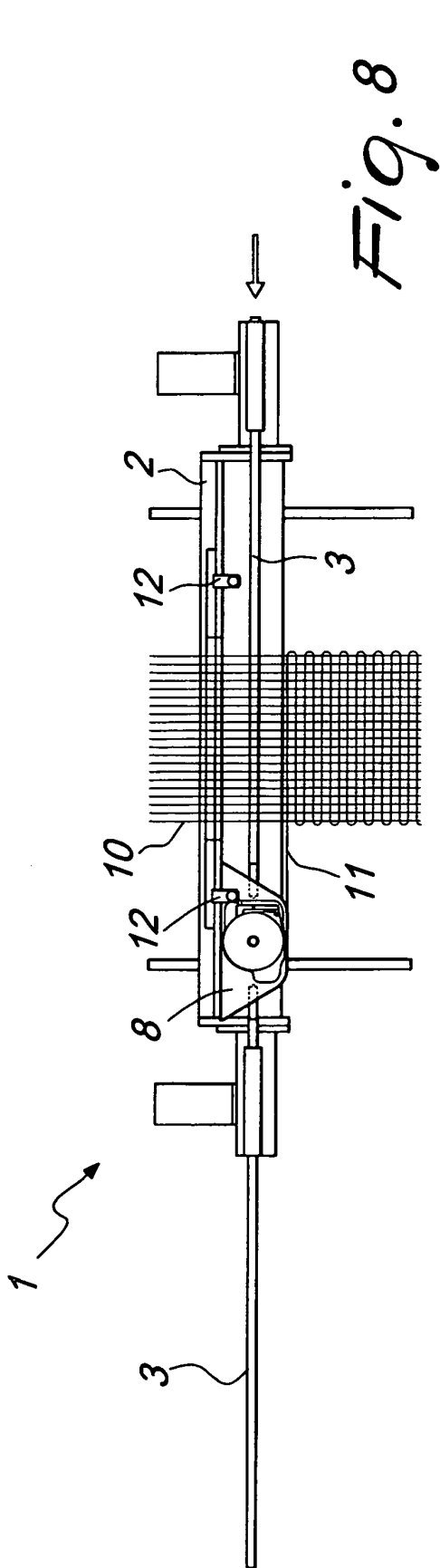


Fig. 2







REFERENCES CITED IN THE DESCRIPTION

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