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(54) Machine for producing at least one continuous rod of smoking material

Vorrichtung zur Herstellung von wenigstens einem fortlaufenden Strang aus Rauchmaterial

Machine pour la production d'au moins une tige continue en matière fumable

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Description

The present invention relates to a machine for producing at least one continuous rod of smoking material.

In particular, the present invention relates to a machine of the type described, for example, in De-B-1101253 and EP-A-0294211, i.e. a machine for producing at least one continuous rod of smoking material of a given diameter, in particular a cigarette rod, which is subsequently cut transversely into cigarette portions, and comprising a forming beam having at least one longitudinal groove; a folding plate mating with said beam and positioned facing the groove, the plate being located a given distance from the beam so as to define, with the groove, a channel for forming a continuous rod; means for detecting said diameter; and an adjusting device interposed between the beam and the plate, for adjusting said distance in response to a signal emitted by said detecting means, said adjusting device comprising adjustable supporting means interposed between the beam and at least one supporting point of the plate.

It is an object of the present invention to provide a machine of the aforementioned type enabling straightforward, effective, automatic control of the rod diameter, for maintaining it substantially constant and equal to a predetermined value.

According to the present invention, there is provided a machine for producing at least one continuous cigarette rod of a given diameter, the machine comprising a forming beam having at least one longitudinal groove; a folding plate mating with said beam and positioned facing the groove, the plate being located a given distance from the beam so as to define, with the groove, a channel for forming a continuous rod; means for detecting said diameter; and an adjusting device interposed between the beam and the plate, for adjusting said distance in response to a signal emitted by said detecting means, said adjusting device comprising adjustable supporting means interposed between the beam and at least one supporting point of the plate; characterized by the fact that hinge means are provided between the beam and the plate for enabling the plate to rotate in relation to the beam and about an axis parallel to said groove; said supporting point being located a given distance from said axis.

According to a preferred embodiment of the above machine, said axis and said supporting point are preferably located on either side of said groove.

Preferably, the adjusting device comprises a cam rotating in relation to the beam and about an axis fixed in relation to the same; said supporting means comprising a tappet associated with said cam and movable by the same in a direction perpendicular to the beam.

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

Fig.1 shows a block diagram of a unit for producing cigarette portions;

Fig.2 shows a partial plan view of a detail on the Fig.1 unit;

Fig.3 shows a section along line III-III in Fig.2.

Number 1 in Fig.1 indicates a machine for producing cigarette portions (not shown) and comprising a forming unit 2 supplied by two known feed units 3 and 4 with two paper strips 5 and, respectively, two streams of tobacco 6 for simultaneously forming two continuous cigarette rods 7 (Fig.s 2 and 3). Machine 1 also comprises a known cutting device 8 located downstream from unit 2 in the traveling direction 9 of rods 7, and which provides for cutting rods 7 into portions (not shown) of given length.

As shown in Fig.s 2 and 3, unit 2 comprises a forming beam 10 having a pair of substantially semicircular-section grooves 11 extending parallel to direction 9 and each designed to receive a respective paper strip 5 and a respective stream of tobacco 6. Unit 2 also comprises a pair of known folding elements 12 extending facing respective grooves 11, and each having a laterally helical-shaped input portion 13, and, on the side facing respective groove 11, a curved-section groove 14 defining, with respective groove 11, the end portion 15 of a channel 16 for forming respective rod 7.

The width of end portions 15 of channels 16 and, consequently, the diameters of respective rods 7 are adjustable automatically by means of an adjusting unit 17 comprising, for each rod 7, an adjusting device 18 associated with a plate 19 common to both devices 18.

Plate 19 supports beam 10, and presents a central longitudinal seat 20 engaged by the bottom portion of beam 10. From the opposite longitudinal ends of plate 19, there project upwards two pairs of lateral appendixes 21 (Fig.s 2 and 3) extending perpendicularly to plate 19 on either side of beam 10 and defining respective forks 22. By means of a pin 23 parallel to direction 9, each fork 22 is hinged to the longitudinal edge of a respective elongated body 24, which may be fixed selectively, about pin 23 and by means of a spherical lock device 25, in two distinct angular positions substantially 90° apart.

On the end opposite that adjacent to plate 19, each body 24 comprises three spaced appendixes 26 parallel to appendixes 21 and defining a fork device 27 to which is hinged, by means of a pin 28 parallel to pin 23, the longitudinal edge of a plate 29 extending from respective body 24 and over beam 10, and pulled towards beam 10 by a spring 30 stretched between plate 29 and respective body 24. On the side facing beam 10, each plate 29 presents a seat 31 housing a respective element 12 connected in removable manner to plate 29 and defining, with the same, a folding plate 32.

As shown in Fig.2, adjusting devices 18 are mutually spaced along beam 10, and each comprises (Fig.3) a cam 33 fitted on to a respective shaft 34 perpendicular to direction 9 and supported for rotation by two bushes 35 integral with plate 19.

Each cam 33 cooperates with a respective tappet

element 36 defined by a cylindrical rod 37 and by a tappet roller 38 contacting the outer surface of cam 33 and connected to one end of rod 37 so as to rotate in relation to rod 37 and about an axis parallel to shaft 34. Each rod 37 extends perpendicular to respective shaft 34, and engages, in axially-sliding manner, a respective sleeve 39 fitted inside a hole 40 formed through plate 19 and beam 10 and between grooves 11. At the opposite end to that fitted with roller 38, each rod 37 cooperates with a respective pin 41 for manually adjusting the zero position of respective plate 32 about respective pin 28. Each pin 41 engages a threaded hole 42 formed in an end portion 43 of respective plate 29 located on the opposite side of respective groove 14 as compared with pin 28 and aligned with the corresponding end portion 43 of the other plate 29 in a direction parallel to direction 9, and is maintained contacting respective tappet element 36 by respective spring 30.

Each device 18 also comprises a device 44 for manually raising respective plate 32. Each device 44 comprises an L-shaped lever 45 having one end integral with a respective elongated body 24 and adjacent to respective appendixes 26, and the free end of which is fitted with a knob 46. Devices 44 provide for rotating respective elongated bodies 24 between said positions, and, consequently, for rotating respective plates 32 between a lowered operating position, wherein plates 32 cooperate with forming beam 10 to define said channels 16, and a raised position wherein plates 32 are positioned clear of beam 10.

Again with reference to Fig.3, each shaft 34 is angularly connected to the output shaft of a respective electric step motor 47 controlled by a respective control device 48 designed to emit a control signal for electric motor 47 as a function of a signal emitted by a respective device 49 for detecting the diameter of rod 7 and preferably of the type known commercially as a "SOLEX 48931 diameter gauge" manufactured by Métrologie Solex M.S.E.

As shown in Fig.1, each control device 48 comprises a comparing unit 50 supplied with a first input signal from detecting device 49, and a second input signal from a known emitter 51 for emitting a reference signal proportional to the required diameter of respective rod 7. Comparing unit 50 determines, in known manner, the difference between the two input signals, and, if this exceeds a given threshold, supplies an enabling signal, proportional in value and sign to said difference, to a known unit 52 for controlling respective electric motor 47.

On receiving said enabling signal, unit 52 activates respective motor 47 in known manner and in one direction or the other, so as to adjust the angular position of respective plate 32 about respective pin 28 and, consequently, the diameter of respective channel 16 and respective rod 7 until the enabling signal is annulled, thus maintaining the diameter of respective rod 7 substantially equal at all times to a predetermined value.

Claims

1. A machine (1) for producing at least one continuous cigarette rod (7) of a given diameter, the machine (1) comprising a forming beam (10) having at least one longitudinal groove (11); a folding plate (32) mating with said beam (10) and positioned facing the groove (11), the plate (32) being located a given distance from the beam (10) so as to define, with the groove (11), a channel (16) for forming a continuous rod (7); means (49) for detecting said diameter; and an adjusting device (17) interposed between the beam (10) and the plate (32), for adjusting said distance in response to a signal emitted by said detecting means (49), said adjusting device (17) comprising adjustable supporting means (36) interposed between the beam (10) and at least one supporting point of the plate (32); characterized by the fact that hinge means (27) are provided between the beam (10) and the plate (32) for enabling the plate (32) to rotate in relation to the beam (10) and about an axis (28) parallel to said groove (11); said supporting point being located a given distance from said axis (28).

2. A machine as claimed in Claim 1, characterized by the fact that said axis (28) and said supporting point are located on either side of said groove (11).

3. A machine as claimed in Claim 2, characterized by the fact that the adjusting device (17) comprises a cam (33) rotating in relation to the beam (10) and about an axis (34) fixed in relation to the beam (10); said supporting means (36) comprising a tappet element (36) associated with said cam (33) and moving, by virtue of said cam (33), in a direction perpendicular to the beam (10).

4. A machine as claimed in Claim 3, characterized by the fact that elastic means (30) are provided for maintaining said tappet element (36) permanently compressed between the plate (32) and the cam (33).

5. A machine as claimed in Claim 3 or 4, characterized by the fact that a motor (47) is connected angularly integral with said cam (33); the adjusting device (17) comprising control means (48) in turn comprising reference means (51) for emitting a reference signal proportional to a given diameter of said rod (7), comparing means (50) for comparing said reference value with a value measured by said detecting means (49), and a control unit (52) for emitting a control signal for said electric motor (47) in response to a signal emitted by said comparing means (50).

6. A machine as claimed in any one of the foregoing Claims, characterized by the fact that said plate

(32) presents a threaded pin (41) fitted to the plate (32) and axially adjustable in a direction substantially perpendicular to said beam (10); one end of said pin defining said supporting point.

Patentansprüche

1. Eine Maschine (1) zur Herstellung von mindestens einem kontinuierlichen Zigarettenstrang (7) mit einem vorgegebenen Durchmesser, die Maschine (1) umfaßt: eine Formgebungsschiene (10), die mindestens eine längliche Kehle (11) besitzt; eine an die genannte Schiene (10) angepaßte und in Gegenüberlage zu der Kehle (11) positionierte Faltplatte (32), wobei die Platte (32) mit einem vorgegebenen Abstand von der Schiene (10) angeordnet ist, um mit der Kehle (11) einen Kanal (16) zur Ausbildung eines kontinuierlichen Stranges (7) abzugrenzen; eine Vorrichtung (49), um den erwähnten Durchmesser zu ermitteln; und eine zwischen die Schiene (10) sowie die Platte (32) eingefügte Justiervorrichtung (17), um den besagten Abstand in Abhängigkeit von einem von der genannten Ermittlungsvorrichtung (49) ausgegebenen Signal zu justieren, wobei die erwähnte Justiervorrichtung (17) einstellbare, zwischen die Schiene (10) sowie mindestens einen Lagerungspunkt der Platte (32) eingesetzte Stützeinrichtungen (36) enthält; gekennzeichnet durch die Tatsache, daß zwischen der Schiene (10) sowie der Platte (32) Gelenkmittel (27) vorgesehen sind, um der Platte (32) ein Drehen mit Bezug zu der Schiene (10) sowie um eine zu der genannten Kehle (11) parallele Achse (28) zu ermöglichen; der besagte Lagerungspunkt ist mit einem vorgegebenen Abstand von der erwähnten Achse (28) angeordnet.

2. Eine Maschine nach Anspruch 1, gekennzeichnet durch die Tatsache, daß die erwähnte Achse (28) und der besagte Lagerungspunkt auf beiden Seiten der genannten Kehle (11) angeordnet sind.

3. Eine Maschine nach Anspruch 2, gekennzeichnet durch die Tatsache, daß die Justiervorrichtung (17) eine mit Bezug zu der Schiene (10) sowie um eine in bezug auf die Schiene (10) feste Achse (34) herum drehende Steuerkurve (33) umfaßt; die genannten Stützeinrichtungen (36) enthalten ein mit der besagten Steuerkurve (33) in Verbindung stehendes und sich aufgrund der besagten Steuerkurve (33) in einer zu der Schiene (10) rechtwinkligen Richtung bewegendes Stößelelement (36).

4. Eine Maschine nach Anspruch 3, gekennzeichnet durch die Tatsache, daß elastische Mittel (30) vorgesehen sind, um das erwähnte Stößelelement (36) ständig zwischen der Platte (32) und der Steuerkurve (33) im Druckzustand zu halten.

5. Eine Maschine nach Anspruch 3 oder 4, gekennzeichnet durch die Tatsache, daß ein Motor (47) in Winkelrichtung einstückig mit der besagten Steuerkurve (33) verbunden ist; die Justiervorrichtung (17) umfaßt eine Steuervorrichtung (48), welche ihrerseits eine Bezugseinrichtung (51), um ein für einen vorgegebenen Durchmesser des genannten Stranges (7) proportionales Bezugssignal auszugeben, eine Vergleichervorrichtung (50), um eine den besagten Bezugswert mit einem von der genannten Ermittlungsvorrichtung (49) gemessenen Wert zu vergleichen, und ein Steuergerät (52), um ein Steuersignal für den erwähnten Elektromotor (47) in Abhängigkeit von einem von der genannten Vergleichervorrichtung (50) ausgegebenen Signal auszusenden, enthält.

6. Eine Maschine nach einem der vorhergehenden Ansprüche, gekennzeichnet durch die Tatsache, daß die genannte Platte (32) einen an der Platte (32) angebrachten sowie axial in einer im wesentlichen zu der erwähnten Schiene (10) rechtwinkligen Richtung justierbaren Gewindestift (41) aufweist; das eine Ende des genannten Stifts bestimmt den besagten Lagerungspunkt.

Revendications

1. Machine (1) de production d'au moins une tige continue de cigarette (7) d'un diamètre donné, la machine (1) comprenant une barre de formage (10) comportant au moins une rainure longitudinale (11) ; une plaque de pliage (32) qui s'adapte à ladite barre (10) et qui est placée en face de la rainure (11), la plaque (32) étant placée à une distance donnée de la barre (10) de manière à délimiter avec la rainure (11) un canal (16) de formage d'une tige continue (7) ; un moyen (49) pour détecter ledit diamètre ; et un dispositif de réglage (17) interposé entre la barre (10) et la plaque (32) pour régler ladite distance en réponse à un signal émis par ledit moyen de détection (49), ledit dispositif de réglage (17) comprenant un moyen réglable de support (36) interposé entre la barre (10) et au moins un point de support de la plaque (32) ; caractérisée par le fait que des moyens d'articulation (27) sont placés entre la barre (10) et la plaque (32) pour permettre à la plaque (32) de tourner par rapport à la barre (10) et autour d'un axe (28) parallèle à ladite rainure (11) ; ledit point de support étant placé à une distance donnée dudit axe (28).

2. Machine selon la revendication 1, caractérisée par le fait que ledit axe (28) et ledit point de support sont placés sur l'un et l'autre côtés de ladite rainure (11).

3. Machine selon la revendication 2, caractérisée par le fait que le dispositif de réglage (17) comprend

une came (33) tournant par rapport à la barre (10) et autour d'un axe (34) qui est fixe par rapport à la barre (10) ; ledit moyen de support (36) comprenant un élément poussoir (36) associé à ladite came (33) et se déplaçant du fait de ladite came (33) dans une direction perpendiculaire à la barre (10).

4. Machine selon la revendication 3, caractérisée par le fait que des moyens élastiques (30) sont prévus pour maintenir ledit élément poussoir (36) comprimé en permanence entre la plaque (32) et la came (33).

5. Machine selon la revendication 3 ou 4, caractérisée par le fait qu'un moteur (47) est raccordé monobloc en rotation à ladite came (33) ; le dispositif de réglage (17) comprenant un moyen de commande (48) comprenant de son côté un moyen de référence (51) destiné à émettre un signal de référence proportionnel à un diamètre donné de ladite tige (7), un moyen de comparaison (50) pour comparer ladite valeur de référence à une valeur mesurée par ledit moyen de détection (49) et un module de commande (52) destiné à émettre un signal de commande dudit moteur électrique (47) en réponse à un signal émis par ledit moyen de comparaison (50).

6. Machine selon l'une quelconque des revendications précédentes, caractérisée par le fait que ladite plaque (32) présente une tige filetée (41) montée sur la plaque (32) et réglable axialement dans une direction sensiblement perpendiculaire à ladite barre (10) ; une extrémité de ladite tige constituant ledit moyen de support.

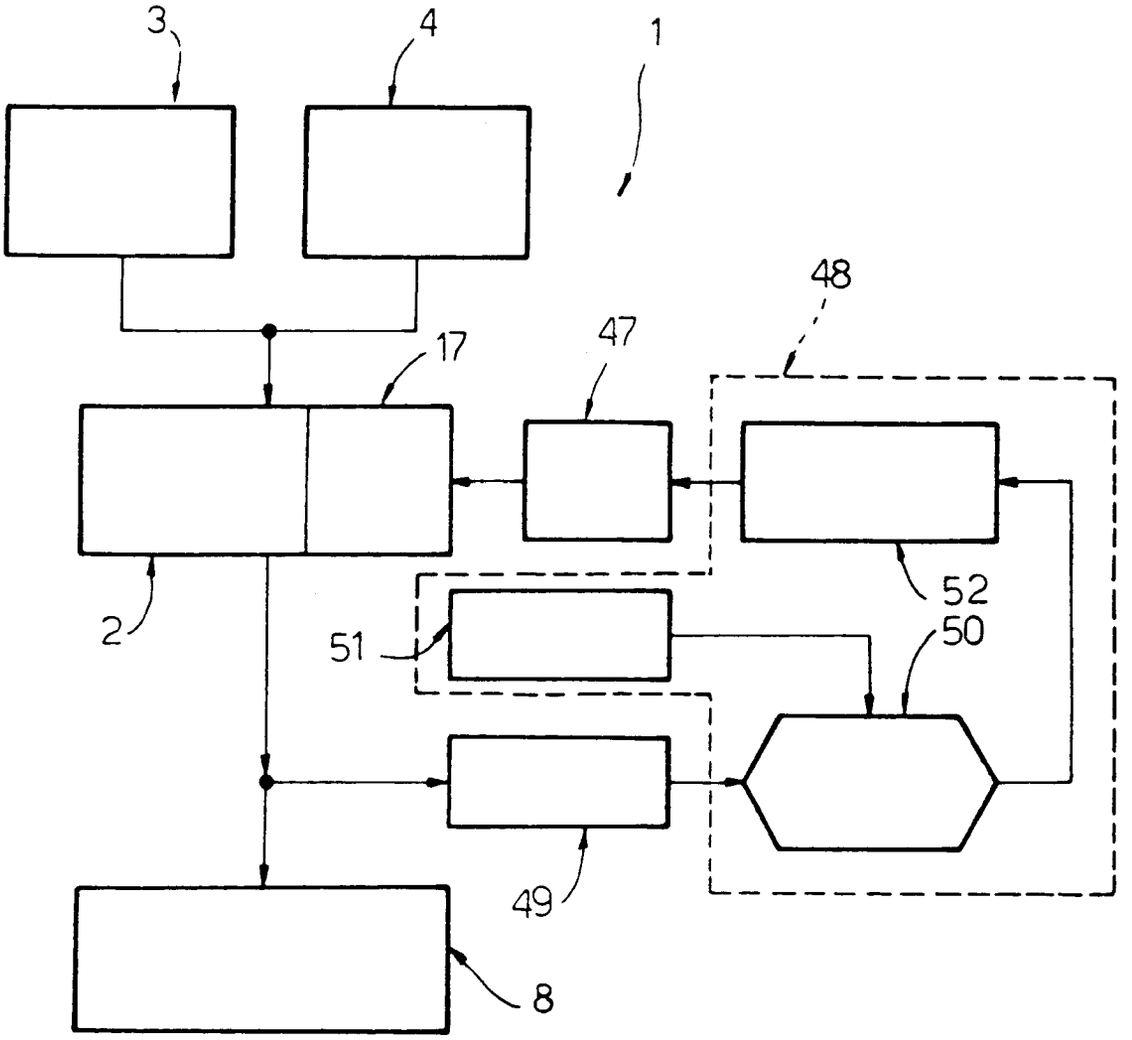

Fig. 1

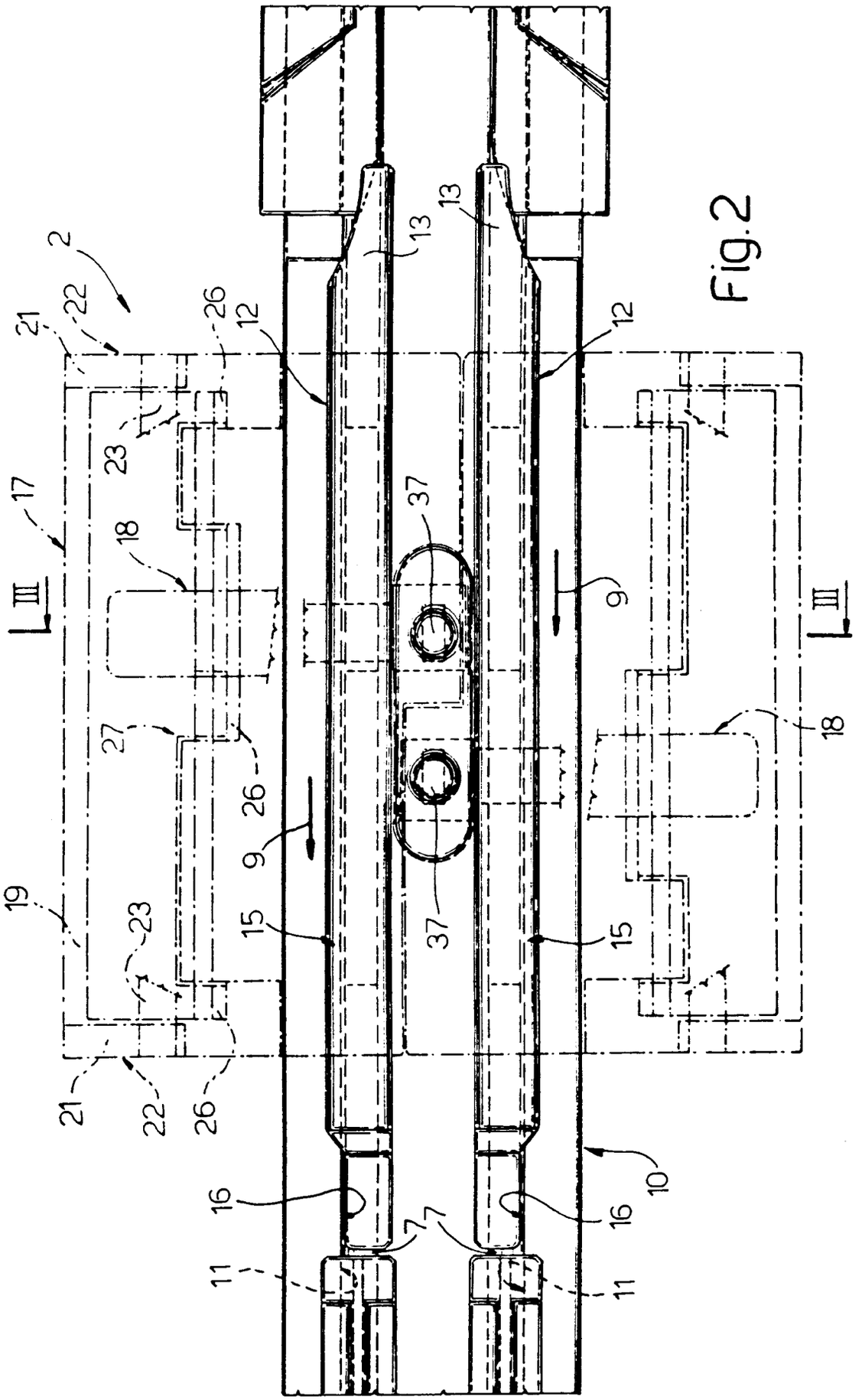

Fig.2

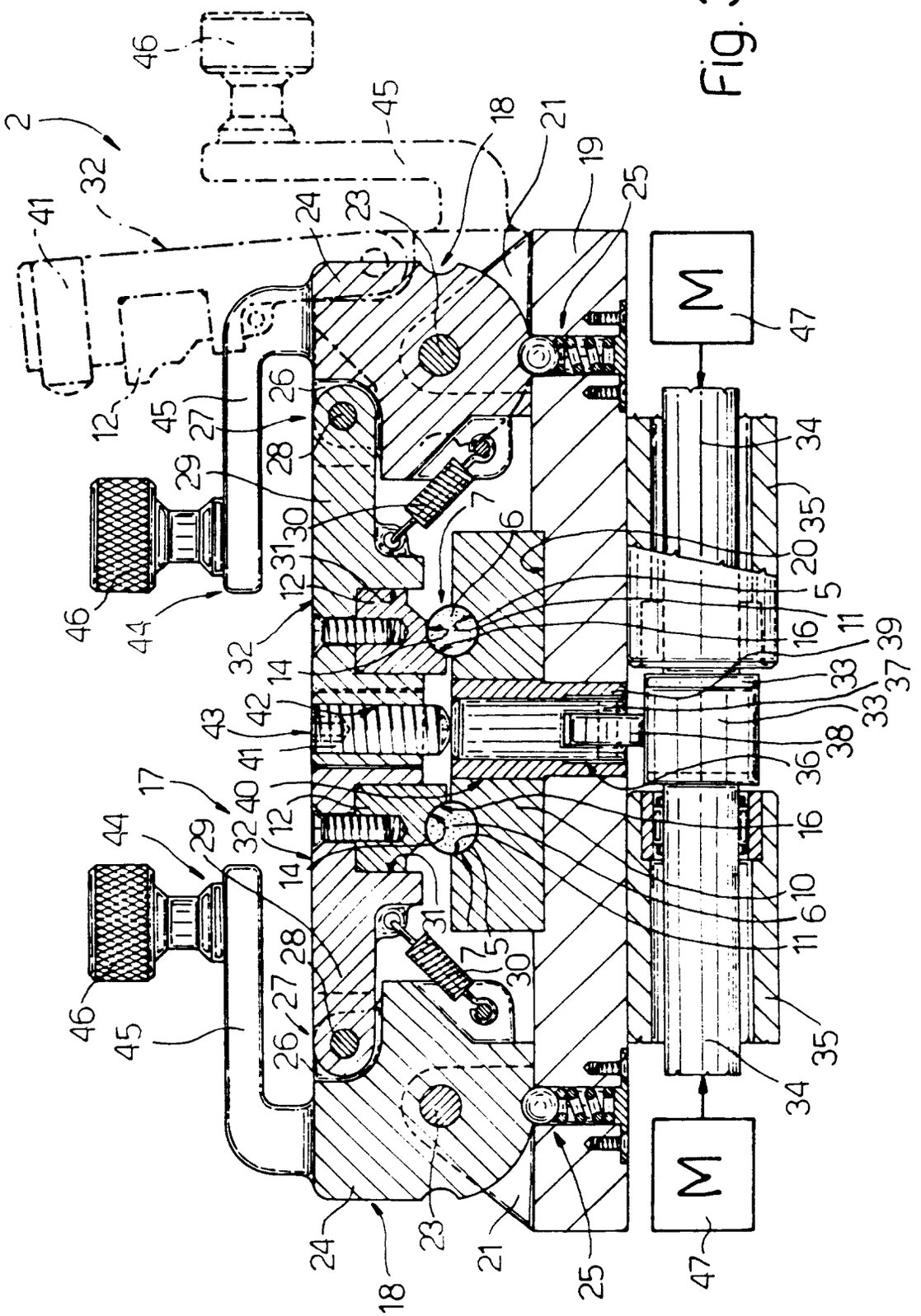

Fig. 3