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(54) Industrial sewing machine for simultaneously performing a plurality of improved seaming lines.

(57) The sewing machine comprises two or more driven shafts which are driven with timed rotary speeds,on one shaft cam members being mounted which,through mechanical motion transmitting members,causes the needle bars,transportation clamps and hooks to swing,these members being so arranged and designed as to perform a plurality of simultaneous seaming lines either of rectilinear,curved or broken configuration.

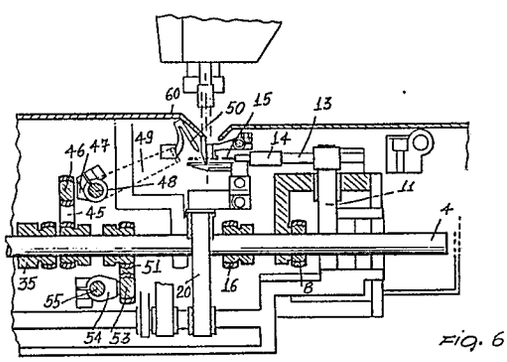


Fig. 6

EP 0 353 208 A1

Description

INDUSTRIAL SEWING MACHINE FOR SIMULTANEOUSLY PERFORMING A PLURALITY OF IMPROVED SEAMING LINES

BACKGROUND OF THE INVENTION

The present invention relates to a sewing machine,for industrial use,which has been specifically designed for simultaneously performing a plurality of different seaming lines.

As is known,in the garment industry frequently arises the need of performing several seaming lines which can be,for example,of the overlock or chain stitch type.

Also known is the fact that the mentioned main stitches must frequently be performed on a given portion of the same cloth or garment.

For example,for seaming a shirt sleeve,it is necessary to provide overlock stitches and then this seaming arrangement must be "stopped" by means of a chain stitch.

These different types of stitches,in particular,must be made on different sewing machines,with different working passes,which,as it should be apparent,in addition to requiring long operating times,frequently provides not perfectly finished products,because of the difficulty of holding the several seaming lines in a properly aligned condition.

SUMMARY OF THE INVENTION

Accordingly,the main object of the present invention is to overcome the above mentioned drawbacks,by providing a sewing machine,for industrial use,which is specifically designed and arranged to perform,in a single pass, two or more seaming lines,either of the like or different type.

Another object of the present invention is to provide such a sewing machine in which the fabric being sewn can also be fed or transported with different angles.

Another object of the present invention is to provide such a sewing machine in which the fabric flaps or portions to be sewn can be oriented in all of the working orienting directions,independently from the fact that said fabric portions are in a loose condition or in a partially assembled condition.

According to one aspect of the present invention,the above mentioned objects,as well as yet other objects,which will become more apparent herein after,are achieved by a sewing machine for industrial use,characterized in that said sewing machine comprises two or more driving shafts,rotatively driven with timed speeds,on one of said driven shafts cam members being keyed which,through mechanical operating assemblies,drive in a swinging and timed manner,needle bars,driving grippers and hook members included in said sewing machine,and operating assemblies being arranged near one another so as to simultaneously perform either rectilinear,curved or broken seaming lines.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the industrial use sewing machine according to the present invention will become more apparent from the following detailed description of a preferred embodiment thereof,which is illustrated,by way of an indicative but not limitative example in the figures of the accompanying drawings,where:

Figures 1,2 and 3 are respectively elevation,side and top plan schematic views illustrating the industrial use sewing machine according to the present invention;

Figure 5 is a vertical cross- section view of the subject sewing machine,taken along the line V-V of figure 4;

Figure 6 is a vertical cross-section view of the subject sewing machine,taken along the line VI-VI of figure 4;

Figure 7 is a cross-sectional view of figure 6;

Figure 8 shows an embodiment of the operating assembly for driving hook members included in the sewing machine;
and

Figure 9 shows several guide members for properly guiding edge portions of the cloth being sewn.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings,the sewing machine for industrial use according to the present invention comprises a supporting frame which has been specifically designed for supporting at least a main shaft 1 which is driven by an electric motor (not shown).

On this main shaft 1 there are keyed at least two pulleys,indicated respectively at 2 and 3,provided for transmitting a rotary movement to corresponding driven shafts 4 and 5 through corresponding belts 6 and 7.

Said driven shafts can also be driven by other driving sources,in a timed manner.

The driven shaft 4 supports a first cam member 8 which,through a connecting rod 9,a ball joint 10 and a swinging pivot sleeve 11,drives a lever 12 for controlling two or more needle bars 13.

These needle bars can be arranged in different planes,with different angles(with a single and timed driving assembly) and can support,by means of clamp members 14,corresponding or respective needles 15 which can be selectively operatively driven.

On the driven shaft 4 there is moreover keyed a second cam member 16 which,through a connecting rod 17,a ball joint 18,a sleeve 19 and a swinging pivot pin 20 drives a trimming knife 21 supported on a

curved supporting arm and the blade of which is indicated at 22.

On the driven shaft 4 there is moreover keyed keyed a third cam member 23 which,through a connecting rod 24,a ball joint 25 and a sleeve 26,drives a first swinging pivot pin 27 which in turn,through a lever,drives a second pivot pin 28.

These pivot pins,in particular,support respective eccentric levers 29 and 30 which can rise gripper bearing sliders,respectively indicated at 31 and 32.

More specifically,the gripper bearing slide 31 fixedly supports the gripper or clamp 33 which operates to feed the fabric to a needle or to the needles.

The slider 32,in turn,supports the gripper or clamp 34 for driving the fabric beyond the first needle assembly.

In this connection it should be pointed out that the gripper 33 can also be called "differential gripper" since it can carry out a different operating stroke from that of the gripper 34 which,in turn,can be called " stitching gripper".

On said driven shaft 4 there is moreover mounted a stitch stretching cam member 35 which, through the connecting rod 36,the ball joint 37 and sleeve 38 can drive a swinging pivot pin 39.

This pivot pin drives rotatively the levers 40 and 41 which are respectively provided with driving pins 42 and 43,which,in operation,drives the respective gripper bearing sliders 31 and 32 so as to bring said sliders in contact with the fabric being sewn and cause said sliders to come back,in a lowered condition,under the control of the mentioned eccentric levers 29 and 30.

It is to be added to the foregoing that the disclosed sewing machine also comprises means for orienting the fabric portions to be sewn in all of the directions,independently from the fact that said portions are loose or assembled.

Thus,the timed operation of the mentioned grippers will provide a simultaneous and timed "transportation" of two or more seaming lines,owing to the different angles of the two or more seaming lines themselves.

On the mentioned driven shaft 4,moreover,there is provided a cam member 44 which,through a connecting rod 45 and a ball joint 46 drives a sleeve 47.

This sleeve,as is shown,restrains a swinging pivot pin 48 thereon there is keyed a lever 49 bearing the lower hook member 50,which can perform a rotary movement.

On the same driven shaft 4 there is moreover keyed a further cam member 51 which,through a connecting rod 52 and a ball joint 53 and sleeve 54 swingably drives a pivot pin 55.

With this latter there is rigidly coupled a lever to which there is articulated an arm 57 which in turn is slidingly coupled to a swinging ball joint 58 and supports,at the free end portion thereof,the upper hook member 59.

A suitable protecting casing 60 is moreover provided,which advantageously also operates as an operating table.

While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof,it should be apparent that the disclosed embodiment is susceptible to several modifications and variations,all of which will come within the spirit and scope of the appended claims.

Claims

1- A sewing machine for industrial use characterized in that said sewing machine comprises two or more driving shafts,rotatively driven with timed speeds,on one of said driven shafts cam members being keyed which,through mechanical operating assemblies,drive is a swinging and timed manner,needle bars,driving grippers and hook members included in sais sewing machine,said operating assemblies being arranged near one another so as to simultaneously perform either rectilinear,curved or broken seaming lines.

2- A sewing maching,according to claim 1,characterized in that said sewing machine comprises a supporting frame supporting at least a main driving shaft thereon there are keyed at least two pulleys rotatively driving corresponding driven shafts through driving belts.

3- A sewing machine according to claim 2,characterized in that one of said driven shafts supports a first cam member which,through a connecting rod,a ball joint and a sleeve with swinging pivot pin drives a lever in turn driving two or more needle bars,said needle bars being arranged in different planes and with different angles and bearing,through clamp members,selectively controlled needles.

4- A sewing machine according to claim 3,characterized in that on said one driven shaft there is keyed a second cam member which,through a respective connecting rod,a ball joint,a sleeve and a swinging pin,drives a trimming knife supported by a supporting arm.

5- A sewing machine according to claim 3,characterized in that on said one driven shaft there is keyed a third cam member which,through a respective connecting rod,ball joint and sleeve drives a further swinging pin,said swinging pins supporting respective cam members adapted to raise gripper supporting sliders.

6- A sewing machine according to claim 5,characterized in that one of said sliders supports a fabric feeding gripper,the other of said sliders supporting a respective gripper for conveying said fabric beyond said needles.

7- A sewing maching according to claim 3,characterized in that on said one driven shaft there is moreover mounted a stitch stretching cam member which,through a connecting rod,a ball joint and a swinging pin swingably drives two levers having driving pins which drive said gripper sliders so as to cause said sliders to contact said fabric and move back to a lowered position in cooperation with said cam members.

8- A sewing machine according to claim

3,characterized in that on said one driven shaft there is moreover provided a further driving cam member which,through a respective connecting rod,ball joint and sleeve supporting a swinging or pivot pin,drives a lever supporting rotatively a lower hook member.

9- A sewing machine according to claim 3,characterized in that on said one driven shaft there is keyed a further cam member which,through a respective coupling rod,ball joint and sleeve,drives a swinging pin therewith a lever is rigid rotatively supporting an arm slidingly coupled to a swinging ball joint and supporting,at a free end portion thereof,a top hook member.

10- A sewing machine according to claim 1,said sewing machine being so designed and arranged as to simultaneously transport two or more seaming lines,with different mutual transport angles.

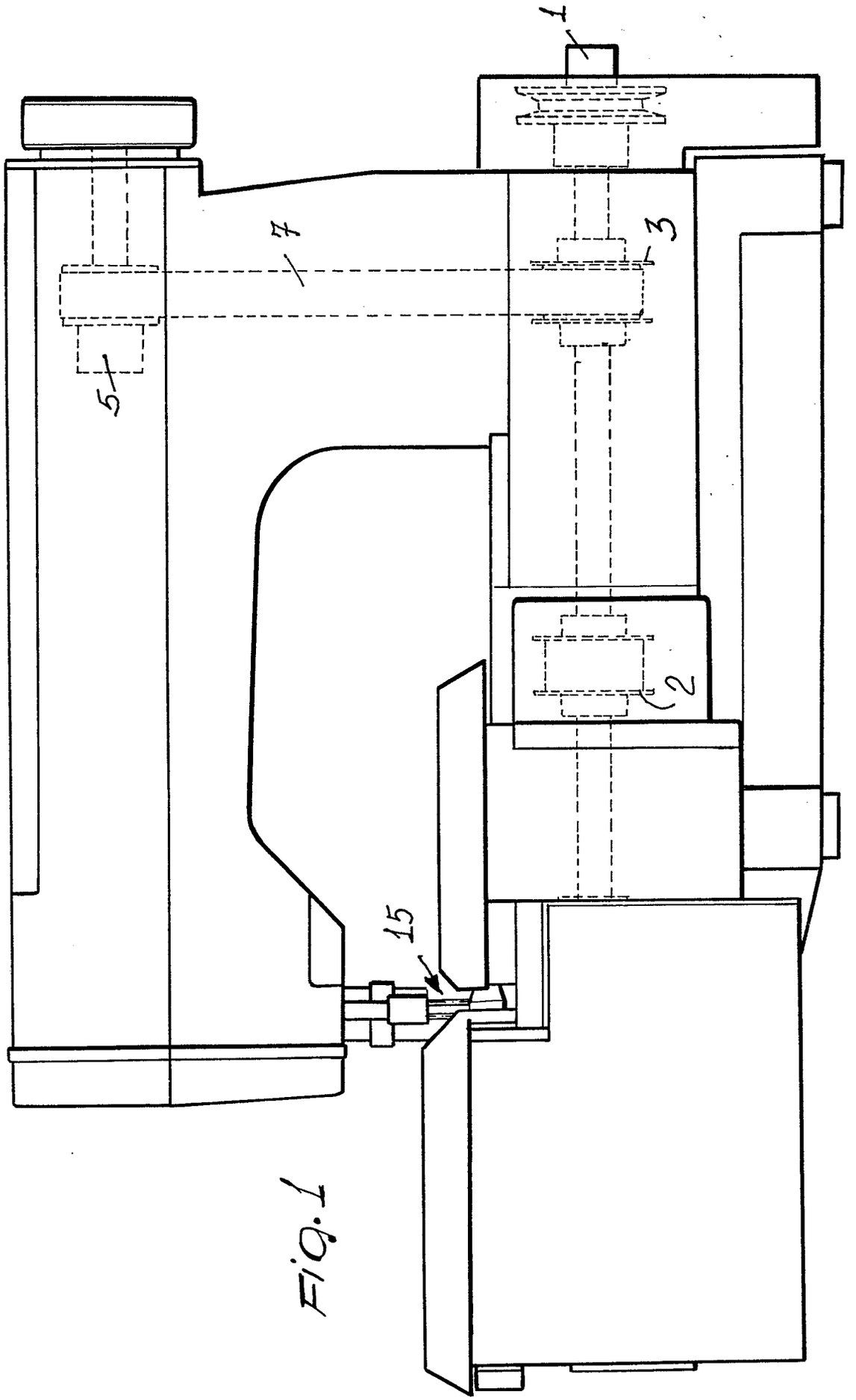
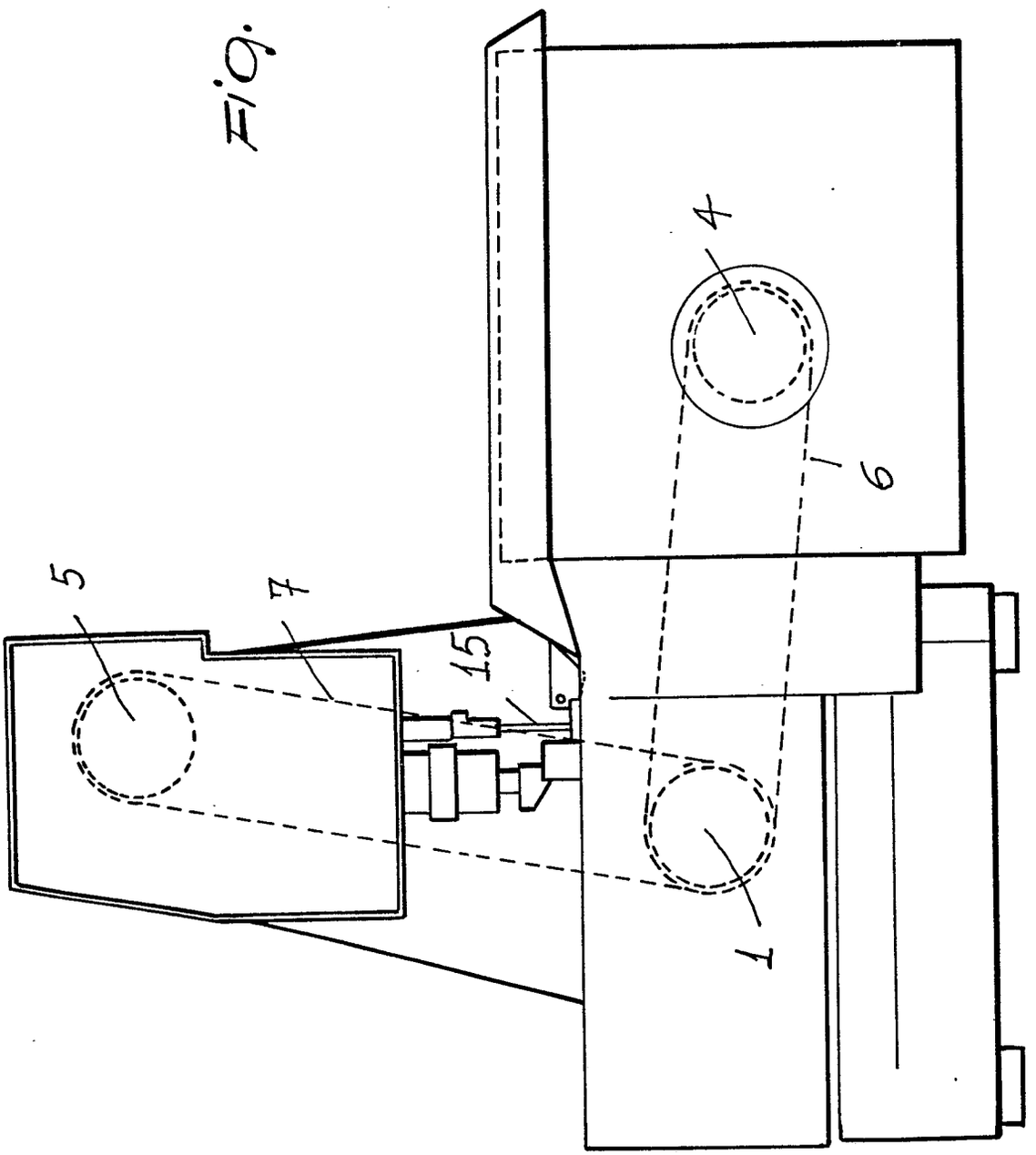


Fig. 1

Fig. 2



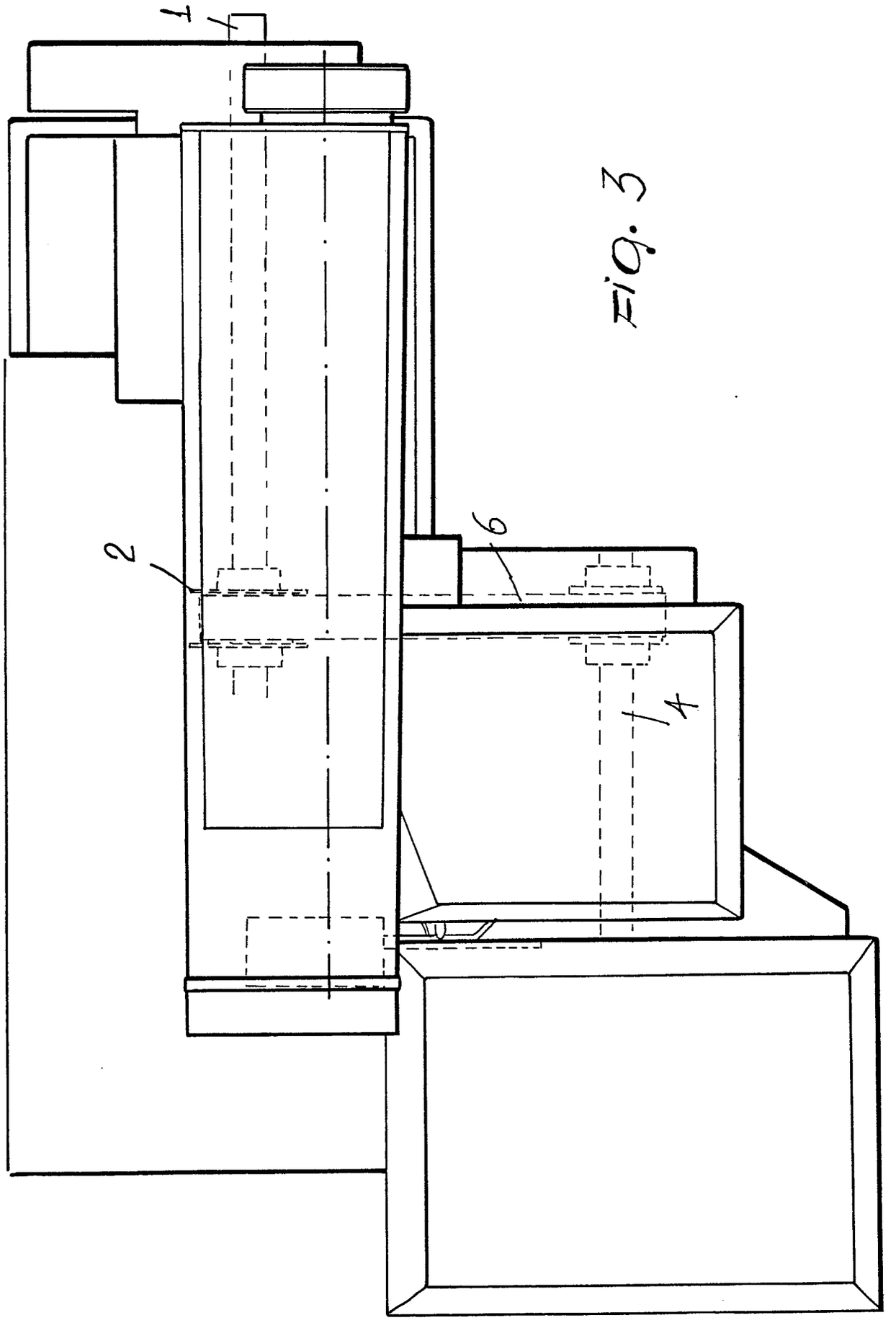


Fig. 3

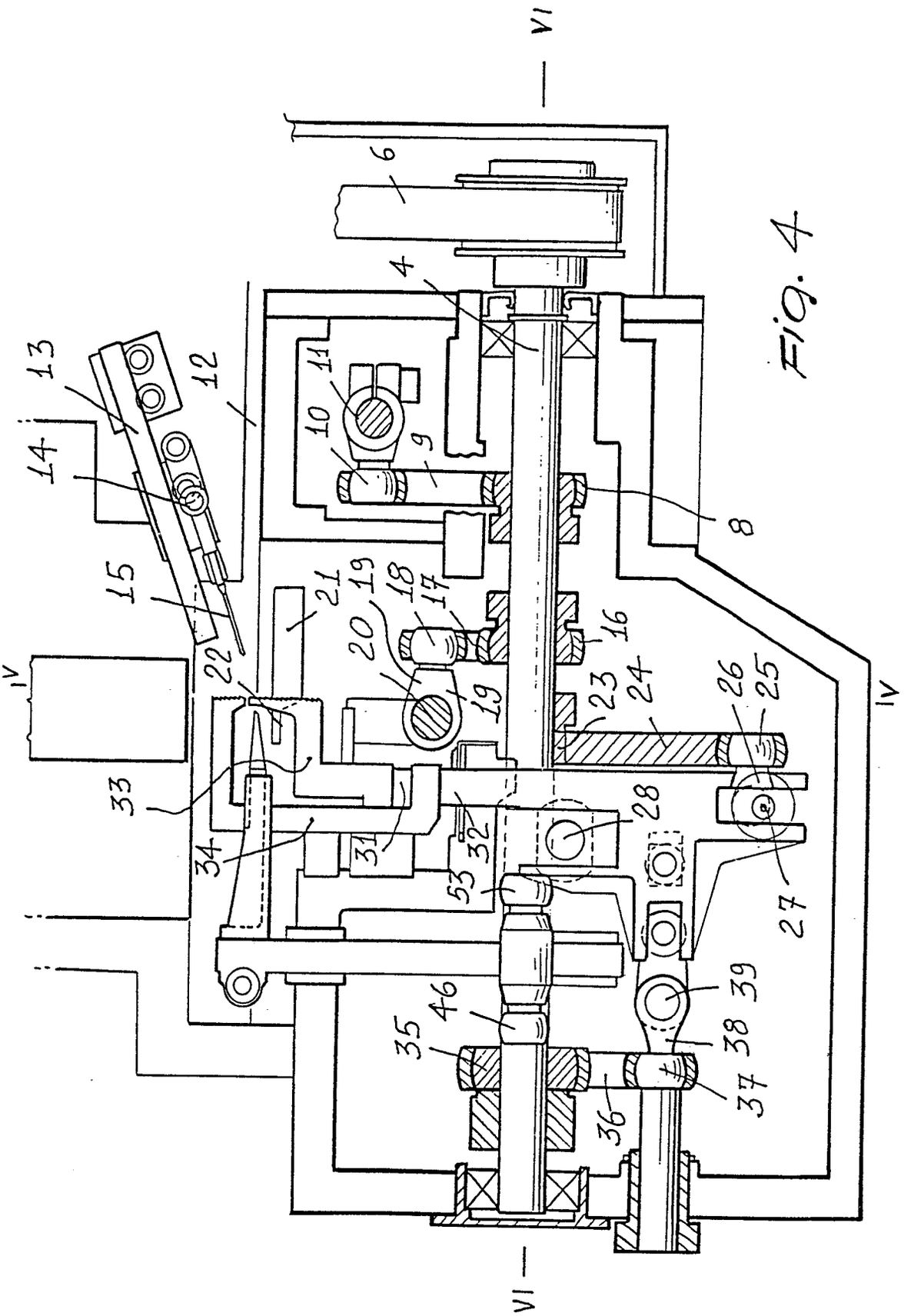

VI
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Fig. 4

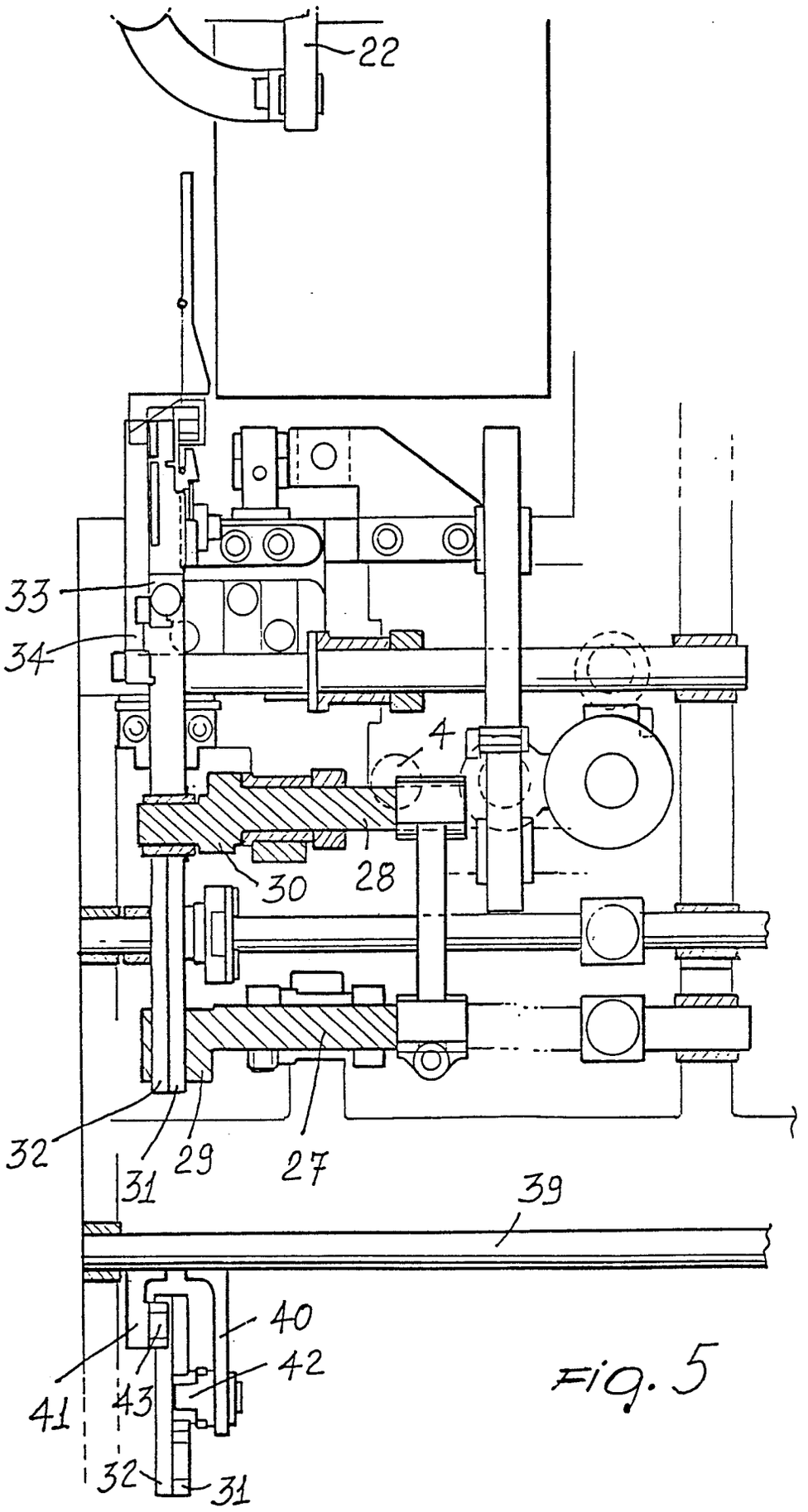

Fig. 5

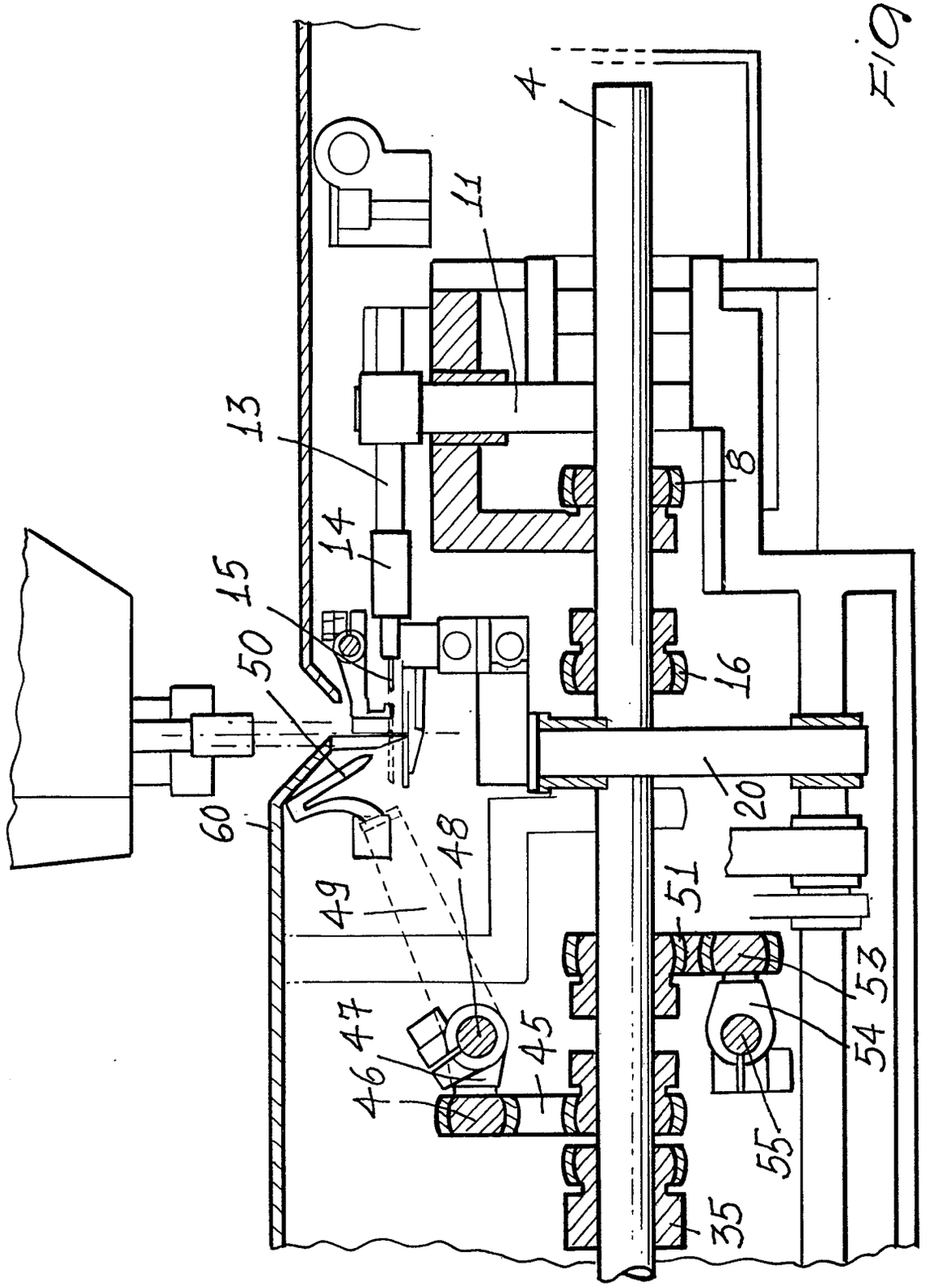

FIG. 6

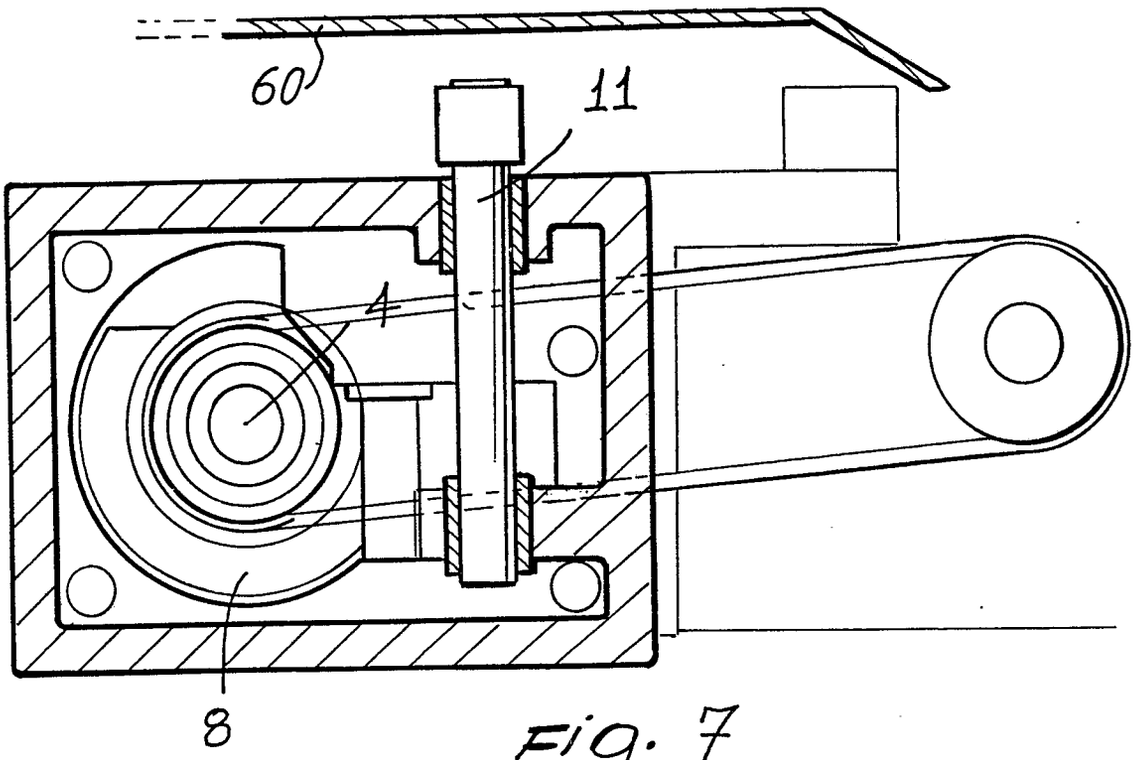

Fig. 7

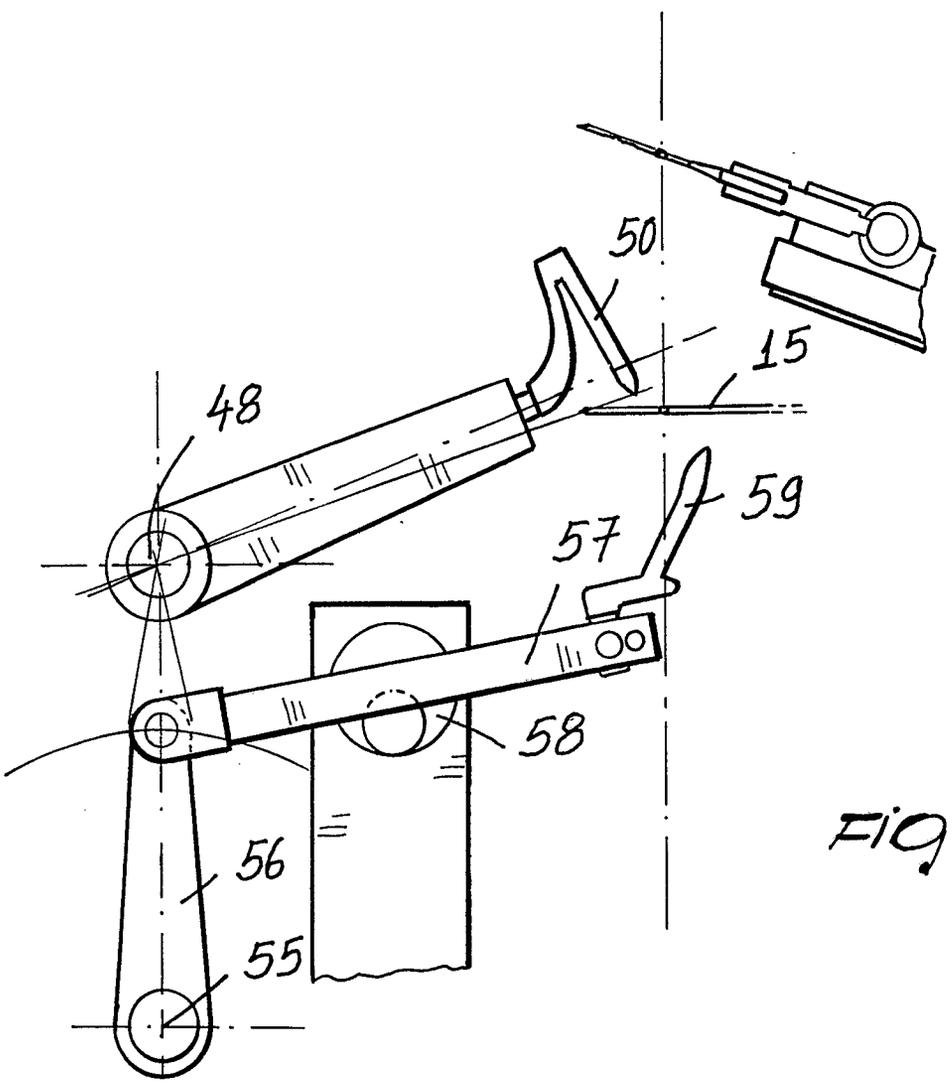

Fig. 8

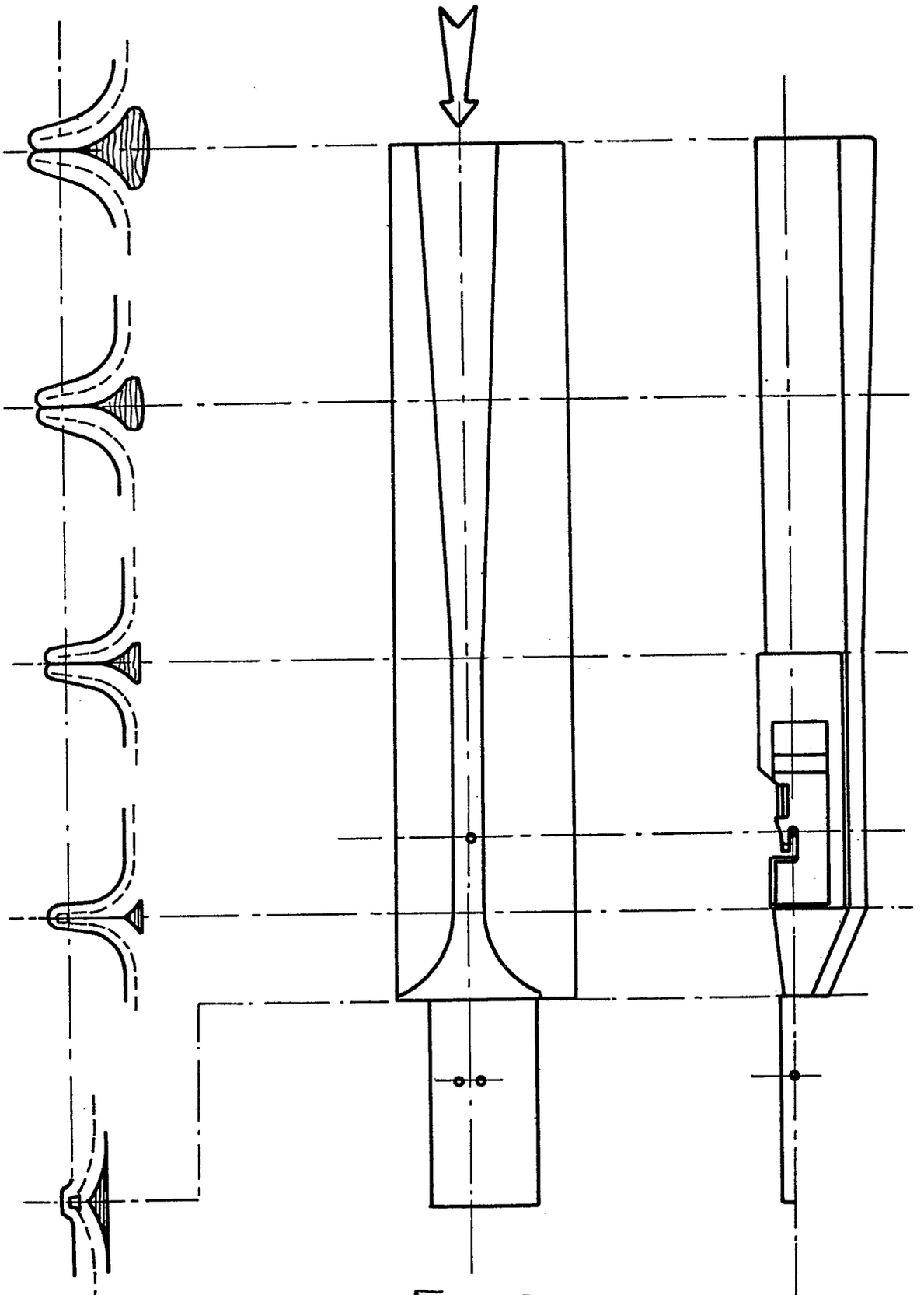

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number

EP 89 83 0344

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-C-72258 (TRACY) * the whole document * ---	1-10	D05B1/20 D05B75/00
X	FR-A-691277 (LEWIS INVISIBLE STITCH) * page 3, lines 80 - 105 * * page 5, paragraph 1 * ---	1-10	
X	US-A-2238796 (SINGER) * figure 6 * ---	1-10	
X	DE-A-3407271 (ROCKWELL-RIMOLDI) * the whole document * ---	1	
X	CH-A-665229 (ROCKWELL-RIMOLDI) * the whole document * ---	1	
X	GB-A-2188951 (VI BE MAC) * the whole document * -----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

D05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	16 OCTOBER 1989	VUILLEMIN L.F.

CATEGORY OF CITED DOCUMENTS

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