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(12) # EUROPEAN PATENT APPLICATION

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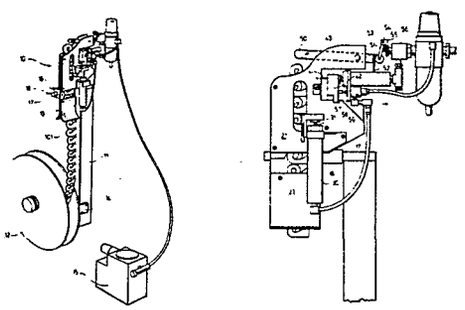
(54) **Apparatus for applying bag closures.**

(57) An apparatus for applying bag closures is disclosed. The apparatus comprises first means for cutting of a closure (39) from a strand of closures being advanced through the apparatus by a second means. In one embodiment, the first and second means are pneumatic piston and cylinder means (44, 30). The apparatus is particularly adapted to apply closures having a handle portion an intermediate portion and a curled end portion forming a bag-receiving opening with an entry throat leading into the bag-receiving opening.



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Apparatus for applying bag closures

The present invention relates to apparatus for application of closures to containers. More particularly, the invention relates to an apparatus wherein the container to be closed is moved along a container closing station whereat there is secured a closure to the container.

A bag closure which the apparatus of the present invention is particularly adapted to use and to apply is taught in U.S. Patent 3,264,698 issued August 9,1966, to C. E. Wright.

An applicator for the Wright closure has been described in U.S. Patent 3,579,955 issued May 25, 1971, to J.C. Gunyou et al. The applicator of Gunyou has been relatively successful in the field, however, there exists now a need to provide an apparatus which is capable of applying bag closures which apparatus is of greater reliability and which is adapted to apply closures at a faster rate.

It is accordingly an object of the present invention to provide an apparatus for application of closures which is particularly reliable in use.

In accordance with the present invention there is provided an apparatus for applying a bag closure to the neck of a bag or similar container, wherein said bag closure is supplied in the form of a continuous strand of joined bag closures, each of said bag closures including a handle portion, an intermediate portion and a curled end portion defining a bag-receiving opening with an entry throat leading thereinto, said apparatus comprising: guide means for guiding a bag neck along a bag travel path; first means actuable on guiding of the bag neck along said bag travel path for severing a closure from said strand of closures; and second means actuable for advancing said strand of closures toward the bag travel path; whereby said first means

and said second means are actuable in predetermined sequence in response to guiding a bag neck along said bag travel path.

The apparatus is readily secured on a base or table and affords easy application of the closure about the neck of a bag or similar container.

Other objects and advantages of the invention will be next described with reference to an embodiment of the invention shown in the accompanying drawings, in which:-

Fig. 1 is a general perspective view of the apparatus in accordance with one embodiment of the invention;

Fig. 2 is a side perspective view from one side showing in greater detail components of one embodiment of apparatus in accordance with the invention in a first position;

Fig. 3 is a side elevational view of the embodiment illustrated in Fig. 2 immediately at the end of an application cycle;

Fig. 4 is an enlarged partially broken away side elevation of part of the apparatus illustrated in Figs. 2 and 3 in a second position immediately prior to the application of a closure to a bag;

Fig. 5 is a further enlarged, partially broken away side elevation, corresponding to Fig. 4 and serves to illustrate the relative positions of apparatus in accordance with the present invention in a third position after a closure has been applied; and

Fig. 6 is a still further side view, partially broken away illustrating the relationsip of the components of the apparatus in a further position after a bag closure has been applied.

As illustrated in the drawings apparatus in accordance with the present invention is generally indicated at 10, and is supported by a vertically extending bar

11 on the lower end of which a spool 12 is mounted to rotate freely on a spindle 13. Spindle 13 is connected to bar 11 by arm 14.

In this particular embodiment the principal power source is compressed air although it will be evident that alternate sources may be employed.

In Fig. 1 an air compressor 15 is illustrated. This may be connected to an electrical outlet by a power cord, not shown. The output of compressor 15 is connected through a filter 100 and valves or switches 56 and 59 to cylinders 44 and 30.

Apparatus 10 is connected to bar 11 by a bracket 16 which is rotatably mounted on shaft 17. A lock not 18 is provided to secure the relationship between shaft 17 and bracket 16. In this manner the attitude of apparatus 10 relative to bar 11 may be varied to accommodate the operator.

On bracket 16 a closure guide 19 is mounted.

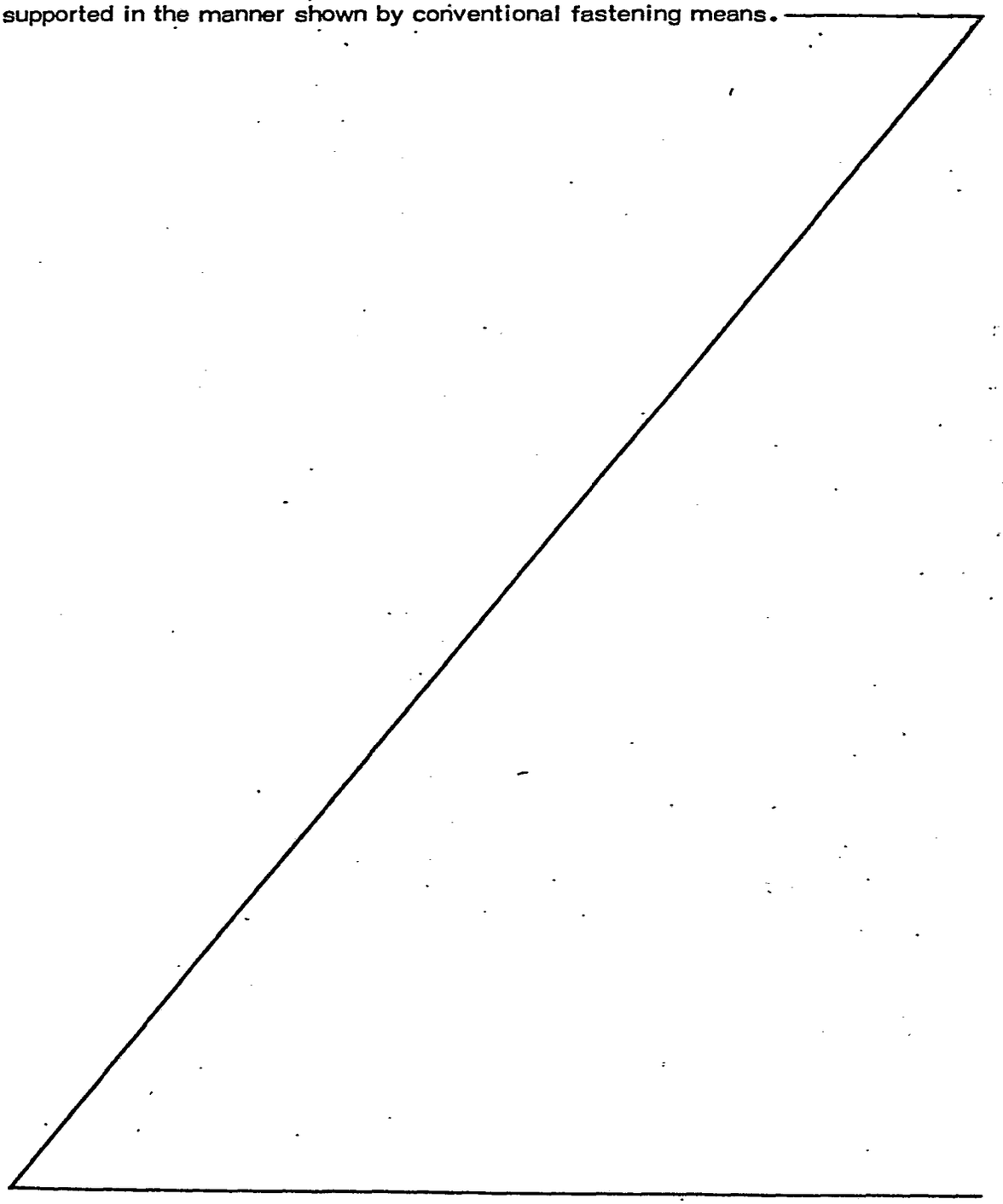
Guide 19 comprises a pair of upper outer plates 20 and 21, a pair of lower guide plates 22 and 23, and a medially disposed severance plate 24 and a further inner upper plate 25.

The upper end of guide plate 22 extends up to the upper limits of the outer plates 20 and 21. The upper edges of plates 20, 21, and 25 are curved slowly downward as illustrated. The upper edge of severance plate 24 is serrated as illustrated in Fig. 5

It will of course be understood that these plates are secured and connected to each other in a spaced apart relationship to permit passage to closures therethrough.

Externally of plate 21 an air actuated cylinder 30 with a piston 31 is mounted. On the upper end of piston 31 an L-shaped bracket 32 is secured. On bracket 32 a finger 33 is rotatably mounted on a shaft 34. A spring 35 biasedly urges finger 33 to pass through an opening 36 and engage closures such as 39. The upper travel of bracket 32 is limited by a stop 40.

Aligned with the upper limit of travel of finger 33 a knife 41 is mounted. Knife 41 is guided through passage in block 42 and mounted on a piston 43 which is actuated by a cylinder 44. Cylinder 44 and its associated components are supported in the manner shown by conventional fastening means.



Block 42 is slidably guided on plate 21 as shown and is provided on its rear surface with a button 57 which is engageable with plunger 58 of a switch 59 which controls cylinder 30.

Between the upper ends of plates 20 and 21 an arm 50 is pivotally mounted. The rear end of arm 50 engages a wheel 51 by means of a depending plate 52. Wheel 51 is supported on an arm 53 pivotally connected to a bracket 54.

Through bracket 54 a plunger 55 extends. Plunger 55 actuates a switch 56. Switch 56 controls piston 44.

On plate 20 a further finger 60 is pivotally mounted and biased into a forward position by a spring 61 to engage a recess such as 62 between adjacent closures 39.

On reel 12 a series of closures 39 which are connected at two spaced apart points is provided. This chain of closures is fed through plates 22 and 23 up beyond the upper surfaces of plates 20 and 21 where they are maintained in position by fingers 33 and 60.

After the closures 39 are in the position just described the closures are oriented in the manner illustrated in Fig. 6 with the opening of the closure aligned with the upper surface of guide plates 20 and 21.

Bag indicated at 200 is then drawn over the upper surfaces of plates 20 and 21 in contact therewith. As the bag 200 is drawn down the forward end of level 50 is depressed. Arm 52 urges wheel 51 rearwards. The wheel 51 ensures that there is a minimum of friction. As wheel 51 retreats arm 53 engages switch 55 to actuate valve 56.

Cylinder 44 is subject to pressure and piston 43 is extended. As piston 43 moves forward knife 41 is carried with it as in Fig. 4 to cut the aligned rear junction between the adjacent closures 39 and 39'.

As bag 200 is continued to be pulled forward it passes into the closure opening. The closure 39 is urged into contact with the serrated edge on plate 24 and as it comes into contact the closure is caused to rotate about the bag 200 and the second forward connection is severed by the rotational force.

As piston 43 retracts button 57 engages switch 58 to actuate valve 59 and supply air to cylinder 30. Cylinder 31 is extended and finger 33 in engagement with the gap between the adjacent closures advances the closures so that the uppermost free closure is now in the position assumed by the former closure. As finger 33 advances since the forward leading edge is angled finger 60 is moved out of engagement with the closures.

When piston 31 is retracted because the nature of the leading edge of finger 33 moves over the closures to engage the rear edge of the third closure 39" and finger 60 again engages the gap between the closures and arm 53 reverts to its original position.

The embodiment of the present invention which has been described provides an efficient simple mechanism which is much more reliable and economical to produce than prior apparatus. In particular the interference arm 50 and its relationship and actuation of the remaining components in response to its motion ensures that there is no inadvertent or false operation.

The mechanism and means for advancing and orienting the closures is substantially foolproof and does not jam.

It will of course be apparent that while a particular embodiment has been described various modification and alternatives will be apparent to those skilled in art without departing from the appended claims.

CLAIMS:

1. Apparatus for applying a bag closure to the neck of a bag or similar container, wherein said bag closure is supplied in the form of a continuous strand of joined bag closures, each of said bag closures including a handle portion, an intermediate portion and a curled end portion defining a bag-receiving opening with an entry throat, characterised in that said apparatus comprises guide means (19) for guiding a bag neck along a bag travel path; first means (41,44) actuable on guiding of the bag neck along said bag travel path for severing a closure (39) from said strand of closures; and second means (30) actuable for advancing said strand of closures toward the bag travel path; whereby said first means and said second means are actuable in predetermined sequence in response to guiding a bag neck (200) along said bag travel path.

2. Apparatus in accordance with claim 1, characterised in that said first and second means includes pneumatic cylinder and piston means (44,43;30,31).

3. Apparatus in accordance with claim 1 or 2 characterised in that said first means for severing a closure from the strand of closures is actuated prior to actuating said second means for advancing said strand of closures.

4. Apparatus in accordance with claim 1 characterised in that actuating trigger means (50) is disposed along the bag travel path for actuating said first and second means.

5. Apparatus for applying a bag closure to a bag neck, whereby the bag neck

is manually gathered and compressed and moved along a guide means for application of a bag closure about the neck of the bag, each of said bag closures including a handle portion, an intermediate portion and a curled end portion defining a bag-receiving opening with an entry throat leading thereto, each of said closures being part of a continuous strand of closures moved to the guide means, characterised in that said apparatus includes a housing (19) defining a travel path for the strand (101) of closures (39) and defining at its upper edge a guide ramp to provide said guide means for application of a bag closure (39); first cylinder and piston means (44,43) ~~means~~ actuable for severing a closure from the strand of closures moving along the travel path in said housing; second cylinder and piston means (30,31) actuable for advancing said strand of closures in said housing toward said guide ramp of said housing; trigger means (50) for actuating said first cylinder and piston means on moving said bag neck (200) along said guide ramp; and means (59) for actuating said second cylinder and piston means upon actuation of said first cylinder and piston means.

6. Apparatus in accordance with claim 5, characterised in that ~~wherein~~ said first and second cylinder and piston means includes pneumatic cylinder and piston means.

7. Apparatus in accordance with claim 6, ~~wherein~~ characterised in that said trigger means includes first trigger means (50) actuable by moving the bag neck (200) along said guide ramp; and second trigger means (57,58) actuable by the piston of said first cylinder and piston means.

8. Apparatus in accordance with claim 1 or 5, ~~wherein~~ characterised in that said closure (39) is rotated relative to the bag neck (200) on movement of said bag neck along said guide means.

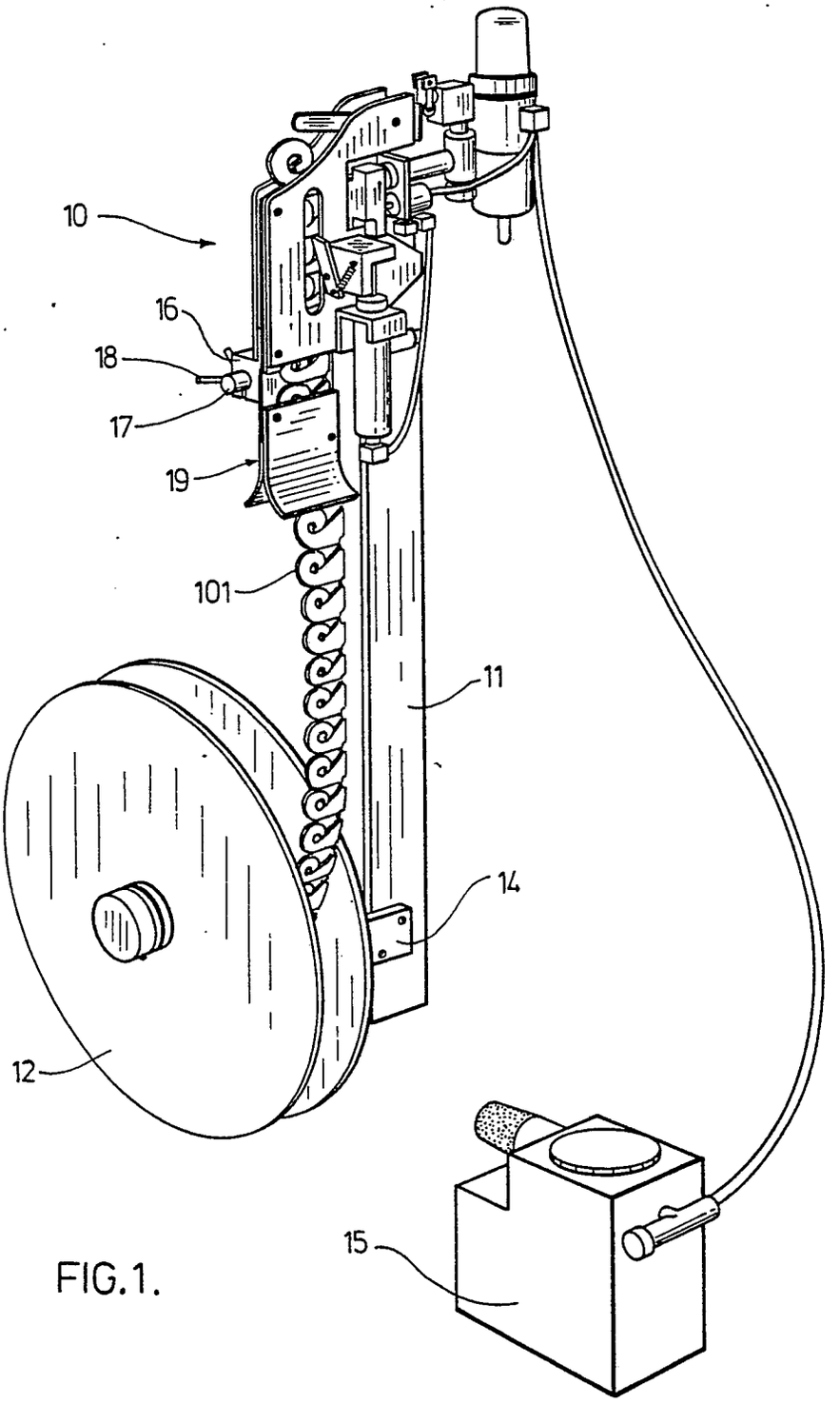


FIG.1.

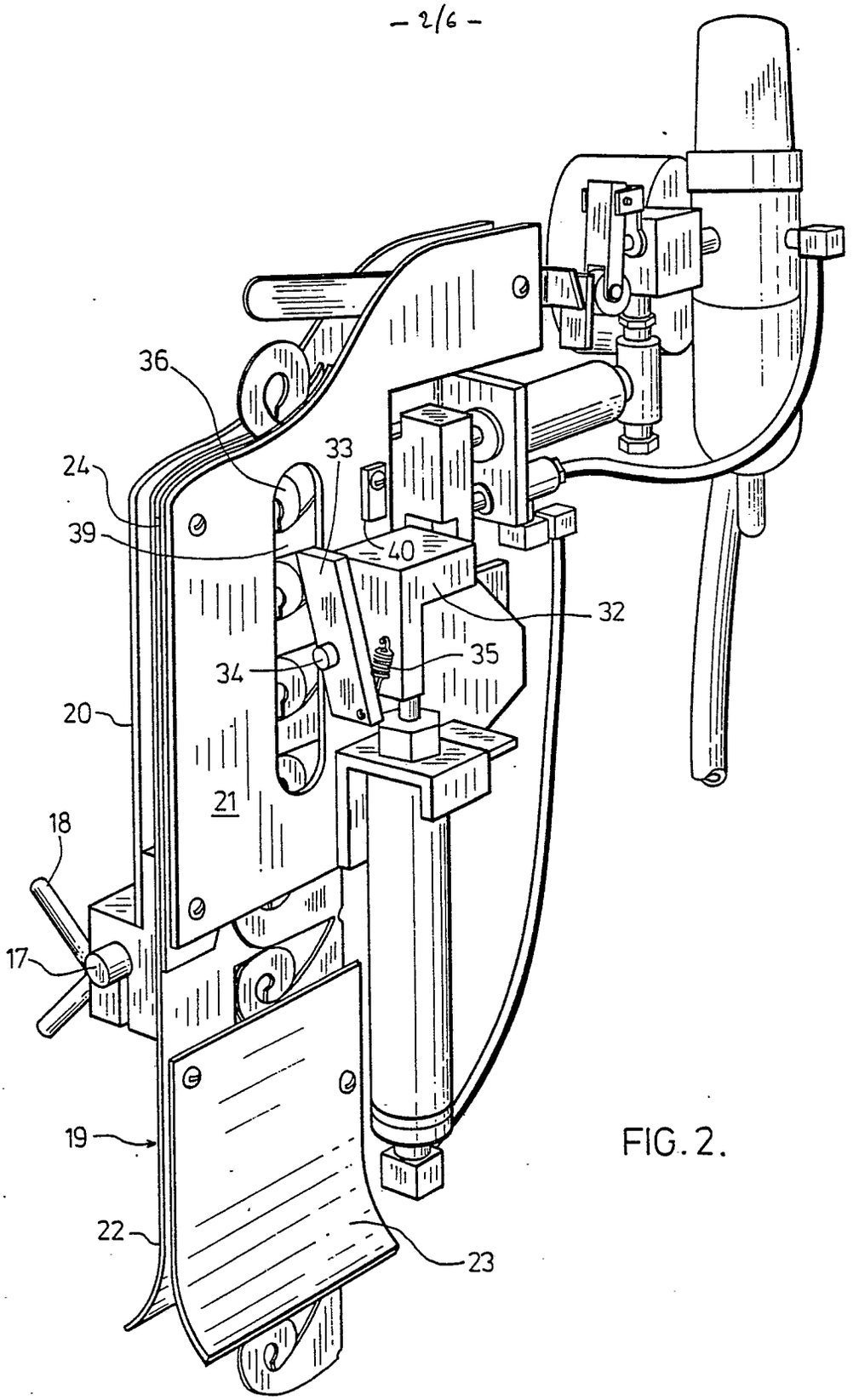


FIG. 2.

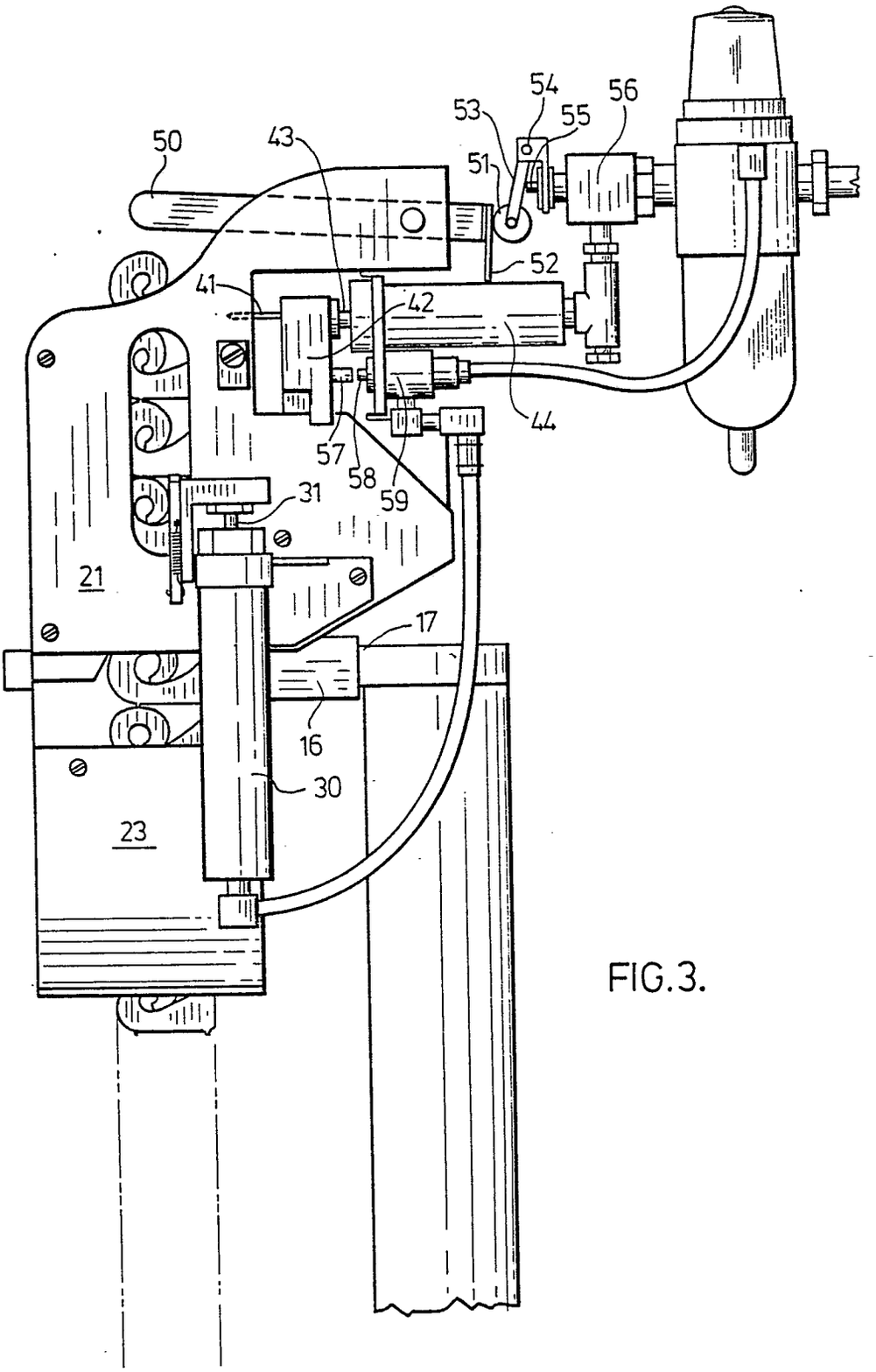


FIG.3.

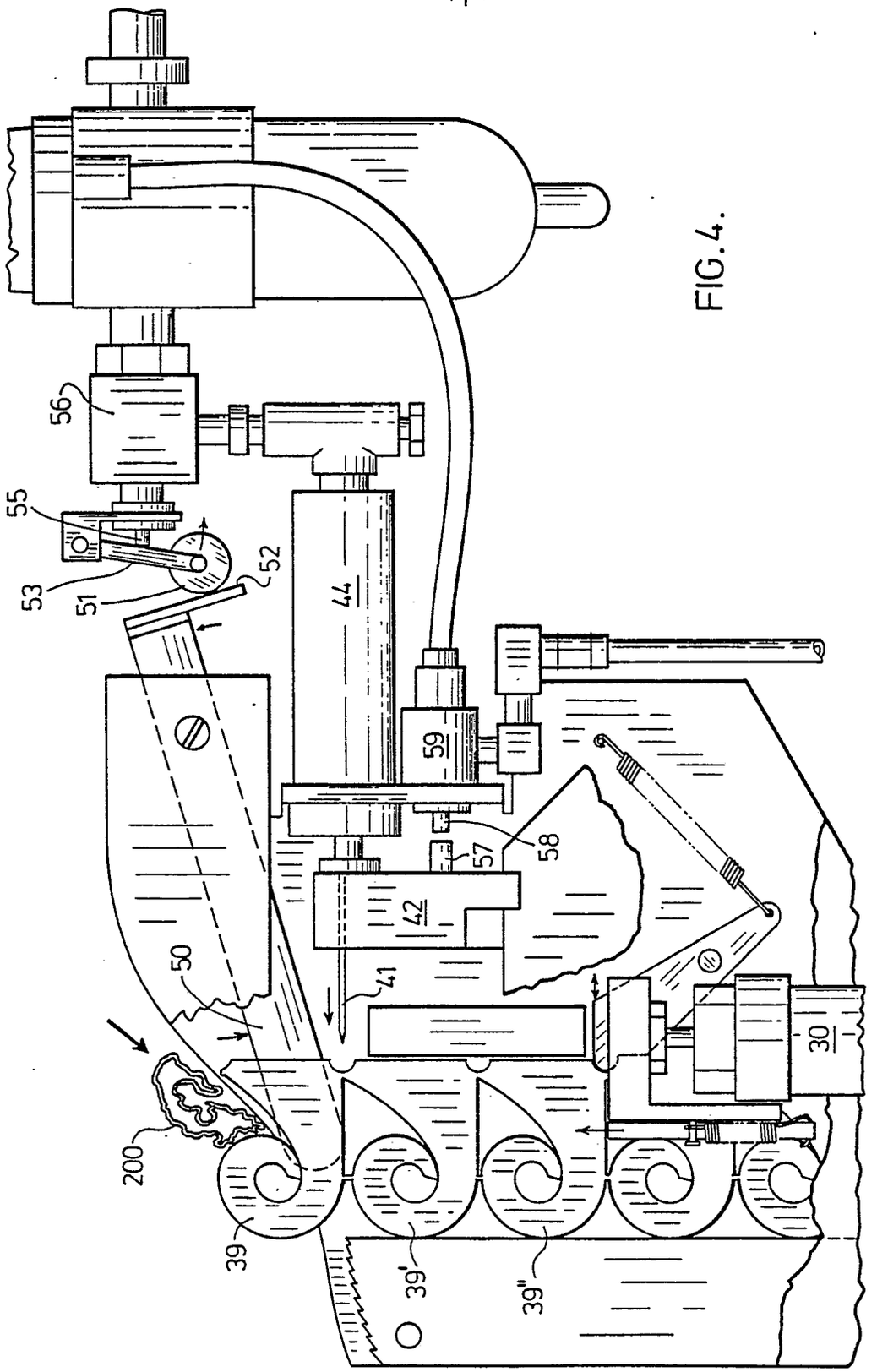


FIG. 4.

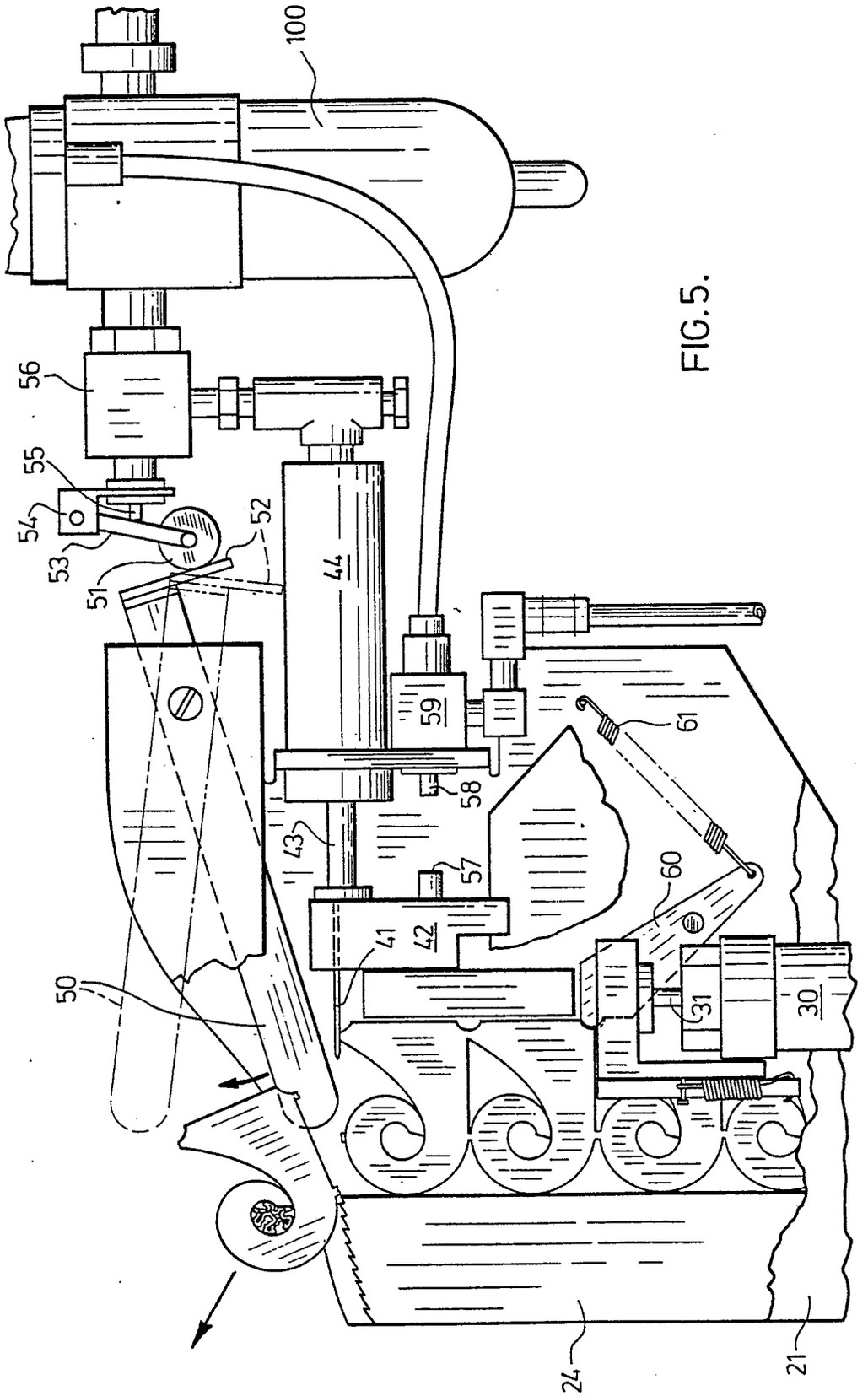


FIG.5.

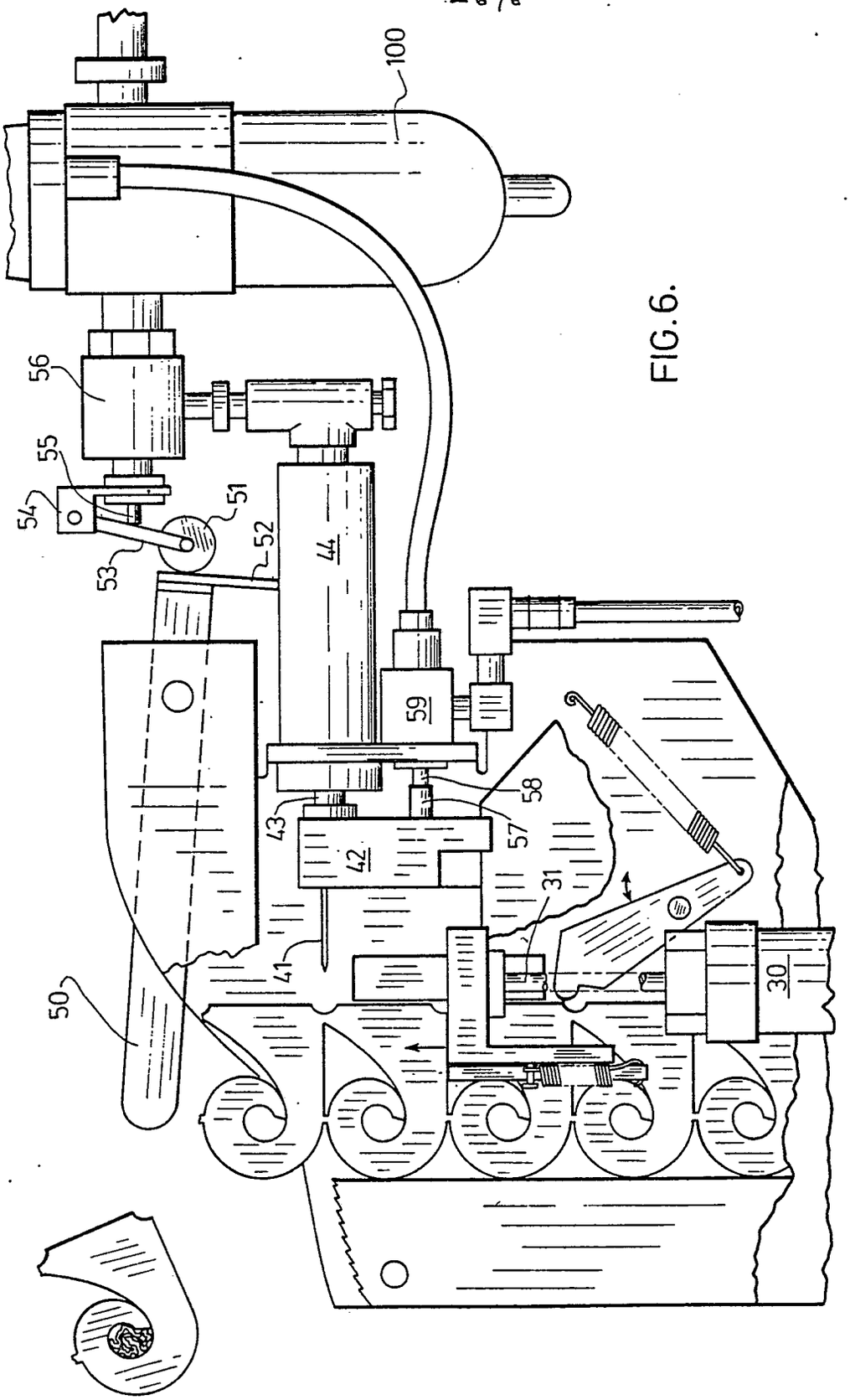


FIG.6.

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EUROPEAN SEARCH REPORT

Application number
EP 80 30 1228

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	US - A - 3 621 632 (S. BROWNING) * Column 3, line 7 - column 6, line 52; figures *	1-8
D	US - A - 3 579 955 (J. GUNYOU) * Column 1, line 54 - column 5, line 28; figures *	1,3,5,8
	US - A - 3 163 969 (J. IRWIN) * Column 10, line 75 - column 13, line 72; figures *	1,3,4,7,8
	US - A - 3 163 972 (J. IRWIN) * Column 11, line 12 - column 12, line 16; figures 2,4,7,8 *	1,3,4,7,8

CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
B 65 B 51/04

TECHNICAL FIELDS SEARCHED (Int.Cl. 3)
B 65 B

CATEGORY OF CITED DOCUMENTS
X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons
&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11-07-1980	JAGUSIAK

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