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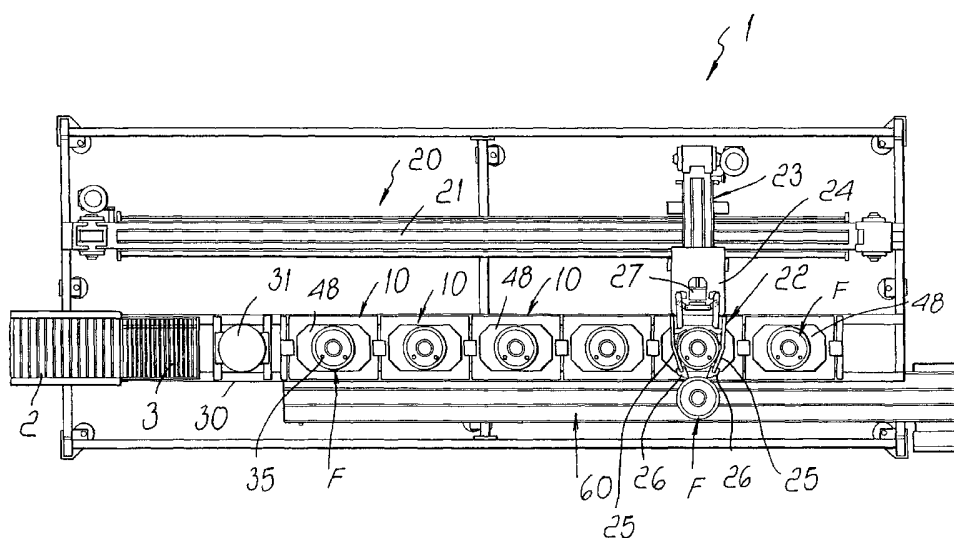
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(54) Title: APPARATUS FOR PROCESSING AND FILLING KEGS FOR BEVERAGES IN GENERAL



(57) Abstract: An apparatus (1) for processing and filling kegs for beverages in general, comprising, at the end of a keg feeder conveyor (2), a plurality of assemblies (10) for processing individual kegs arranged in mutual alignment; a keg loading conveyor (20) is arranged laterally, on one side, to a line of the processing assemblies (10), and there is an unloading conveyor (60) that is laterally adjacent, on the other side, to the line of processing assemblies (10).

APPARATUS FOR PROCESSING AND FILLING KEGS FOR BEVERAGES IN GENERAL

Technical Field

The present invention relates to an apparatus for processing and filling
5 kegs for beverages in general.

Background Art

As is known, apparatuses are already commercially available which process and fill kegs for beverages in general and are in practice constituted by rotary transfer machines on which the keg to be processed is loaded
10 automatically or manually and is transferred in succession to the various functional stations.

The processed and filled keg must then be removed, with all the problems related to handling a keg that is considerably heavier because it has been filled.

15 Another problem that can be ascribed to the solutions of the prior art is that if a defective keg that as such cannot be processed is introduced in the machine, it cannot be excluded from the operating cycle except at the end of said cycle, with an obvious loss of productivity of the machine and of working time.

20 Moreover, another problem that can be ascribed to the solutions of the prior art arises from the fact that the machines are currently very bulky and that it is not possible to achieve full automation of the production cycle.

Disclosure of the Invention

The aim of the present invention is to eliminate the drawbacks described
25 above by providing an apparatus for processing and filling kegs for beverages in general that allows to handle the kegs individually, removing them from the processing cycle at any time during the operating cycle, thus reducing any idle times arising from defective kegs which as such must be removed from the process.

30 Moreover, distribution must occur by way of rotating manifolds, with

obvious implications as regards the tightness of the gaskets and their constructive complexity.

Within this aim, an object of the invention is to provide an apparatus that allows to make it particularly easy to handle the kegs even when they are
5 full, with consequent simplifications in the mechanical system of the assembly.

Another object of the present invention is to provide an apparatus that by having a substantially linear configuration allows to reduce space occupation and further improves the efficiency of the entire production cycle.

10 Another object of the present invention is to provide an apparatus that by way of its particular constructive characteristics is capable of giving the greatest assurances of reliability and safety in use.

Another object of the present invention is to provide an apparatus that can be obtained easily starting from commonly commercially available elements
15 and materials and is further competitive from a merely economical standpoint.

This aim and these and other objects that will become better apparent hereinafter are achieved by an apparatus for processing and filling kegs for beverages in general, according to the invention, characterized in that it
20 comprises, at the end of a keg feeder conveyor, a plurality of assemblies for processing the individual kegs arranged in mutual alignment, there being also a keg loading conveyor that is laterally adjacent, on one side, to the line of the processing assemblies, and an unloading conveyor that is laterally adjacent, on the other side, to said line of the processing assemblies.

25 Brief description of the drawings

Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of an apparatus for processing and filling kegs for beverages in general, illustrated only by way of non-
30 limitative example in the accompanying drawings, wherein:

Figure 1 is a schematic plan view of the apparatus;

Figure 2 is a plan view of the detail of the keg orientation assembly and of the first processing assemblies;

Figure 3 is a view of the step for the transfer of the keg from the orientation assembly to the processing assembly;

Figure 4 is a schematic side elevation view of the apparatus;

Figure 5 is a schematic plan view of a dual apparatus with two loading conveyors and two lines of processing assemblies, arranged so as to be functionally laterally adjacent to a single unloading conveyor;

Figure 6 is a schematic view of the keg lifting assembly;

Figure 7 is a view of a detail of a processing head;

Figure 8 is a view of a processing head coupled to an inclined valve;

Figure 9 is a view of a processing assembly for kegs with a central valve.

Ways of carrying out the invention

With reference to the figures, the apparatus for processing and filling kegs for beverages in general, according to the invention, generally designated by the reference numeral 1, comprises a keg feeder conveyor 2, which can be of any kind and ends with a roller bed 3 on which the kegs are placed. At the end of the roller bed 3 there is a stop element 4, which is controlled by a lifting piston 5 and is designed to stop the incoming keg if the lines are aligned, whereas if the input lines are at right angles there is a fixed stroke limiter.

Downstream of the feeder conveyor 2 there are a plurality of assemblies for processing the individual kegs; the assemblies are generally designated by the reference numeral 10 and are arranged mutually side by side so that the various assemblies, which can be provided in any number according to the capacity of the apparatus, are mutually aligned, preferably along the extension of the conveyor 2.

To the side of the line of the processing assemblies 10 there is a keg loading conveyor, generally designated by the reference numeral 20, which

is arranged on the side of the assemblies 10 and is substantially constituted by a guiding track 21 on which a grip clamp 22, described in greater detail hereinafter, can perform a translational motion by way of an appropriate motor drive; said clamp is connected to a carriage 23 that can perform a translational motion along the guiding track 21 and has a transverse slider body 24 for the translational motion of the clamps 22 toward and away from the processing assemblies 10.

The clamps 22 are generally formed by means of arms 25 with multiple joints that end with pusher tips 26 at their free end and are connected by means of a lever system with multiple joints to an actuation cylinder 27 supported by the slider 24.

The clamps 22 advantageously have inserts made of plastics and steel that allow to retain the keg by means of the plastic inserts and to straighten it, positioning it correctly, by means of steel inserts.

The clamps 22 are designed to pick up the keg, designated by the reference letter F, from the roller bed 3 and transfer it to an orientation assembly 30 after the stroke limiter 4 has been lowered.

It should be noted that the plate 31 of the orientation assembly 30 on which the keg is placed is advantageously arranged at a slightly lower level than the roller bed 3, so that the keg can pass very simply and rapidly.

The orientation assembly 30 is used in the case of kegs F that have two eccentric valves, designated by the reference numeral 35, that must both be orientated in the same position.

In the case of kegs F that have a single central valve, it is obviously not necessary to use the orientation assembly, which might be omitted, and an assembly for checking the position of the keg might be provided.

The keg F, once it has been orientated by way of the rotation of the plate 31, is picked up by the carriage 23 and in particular by the arms 25 of the clamps 22 that support the keg; the clamps pick up the keg from the orientation assembly 30 and transfer it onto the free processing assembly by

moving away from the orientation assembly 30, by retracting the slider 24 and subsequently performing a translational motion of the carriage 23 up to the chosen processing assembly, where the keg is positioned by way of the advancement of the slider 24.

5 It should be noted that during this transfer step the keg is empty and accordingly has a relatively low weight, so that it is not necessary to provide a particularly substantial mechanical system since the weights involved are relatively low.

The processing assembly 10, in the case of treatment of kegs F with two
10 eccentric valves, as shown in Figure 6, has two heads 40, shown more clearly in Figures 7 and 8, that are supported by a bush 41 that is connected to a fixed plate 42 by inserting in a conical seat 43 a conical tang 44 that is connected to the stem of the head.

The body of the head 40 can perform a translational motion with respect
15 to the bush in contrast with the action of elastic pusher means 45, so that when the keg is lifted by means of the lifting assembly 48 that carries the keg F toward the heads, the heads 40 are made to perform an upward translational motion, and if the valves 35 are not perfectly aligned the flared portion 49 of the inlet of the head allows to still perform insertion, which is
20 aided by the possibility of the head to oscillate in order to disengage the tang 44 from the conical seat 43.

This solution allows to compensate for any axial offsets without causing the rejection of the container.

In the case of containers F with a central valve 50, as shown in Figure 9,
25 there is a lower head 51, and the keg, which is arranged so that the valve is directed downward, is handled by means of a cage 52 that engages, in an upper region, the stem 53 of a handling piston 54; the stem 53 ends with a pan 55 that engages detachably, by pushing, the bottom of the keg F, moving the cage 52 so that it overcomes the contrast of the elastic and/or pneumatic
30 supporting means 57 and consequently causing the downward translational

motion of the keg until it engages the lower head 51.

Once the operation has ended, the stem 53 is made to rise and the pan 55 lifts the cage, moving the keg away from the head.

Once the kegs have been processed and filled, both in the case of an apparatus for kegs with eccentric valves and in the case of an apparatus for
5 kegs with central valves, the keg is unloaded by placing it on an unloading conveyor 60, which is laterally adjacent to the processing assemblies 10 on the opposite side with respect to the loading conveyor 20.

The unloading conveyor 60, which is advantageously constituted by
10 chains that run continuously, is arranged so that its active portion is at a slightly lower level than the supporting surface of the kegs inside the processing assemblies 10.

Unloading is performed by the tips 26 of the clamps 22 directly during the loading of a new keg to be processed.

15 In practice, the unloading of the full keg, which is therefore relatively heavy, is performed simply by pushing and without having to lift it.

This fact is extremely important, since the forces involved are greatly reduced and further the operating times are reduced since unloading is performed simultaneously while introducing the next keg for treatment.

20 It should also be noted that if there is a defective keg in a processing assembly, said keg can be removed without having to wait for the operating cycle time but simply by expelling the defective keg onto the unloading conveyor.

As shown in Figure 5, it is possible to optimize the apparatus by
25 providing a single unloading conveyor that is arranged centrally and is flanked, on both sides, by lines of processing assemblies with the corresponding loading conveyors.

It is thus evident from what has been described above that the invention achieves the intended aim and objects and in particular the fact is stressed
30 that the use of a machine with a plurality of processing assemblies arranged

in line allows to process and fill the individual kegs independently of each other, so that any defective keg is not subjected to the entire processing cycle but can be removed immediately, thus reducing the times related to rejects.

Further, the positioning of the processing assemblies in line and of the loading conveyor on one side and of the unloading conveyor on the other side allows to provide a highly efficient and quick operating cycle, in which the full kegs are handled simply by pushing and accordingly, the mechanical system of the entire apparatus is simplified considerably, since the clamps must pick up only empty kegs which accordingly have a relatively low weight.

The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details may further be replaced with other technically equivalent elements.

In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements.

The disclosures in Italian Patent Application No. MI2001A001674 from which this application claims priority are incorporated herein by reference.

CLAIMS

1. An apparatus for processing and filling kegs for beverages in general, characterized in that it comprises, at the end of a keg feeder conveyor, a plurality of assemblies for processing individual kegs arranged in mutual alignment, a keg loading conveyor that is laterally adjacent, on one side, to a
5 line of the processing assemblies, and an unloading conveyor that is laterally adjacent, on the other side, to said line of the processing assemblies.

2. The apparatus according to claim 1, characterized in that it comprises, at the end of said keg feeder conveyor, a stop element for the keg that is
10 controlled by a lifting piston.

3. The apparatus according to claim 1, characterized in that it comprises a keg orientation assembly that is interposed between said keg feeder conveyor and said line of processing assemblies.

4. The apparatus according to one or more of the preceding claims, characterized in that it comprises, on said loading conveyor, a clamp for
15 gripping and picking up an incoming keg and transferring it to a chosen processing assembly.

5. The apparatus according to one or more of the preceding claims, characterized in that said loading conveyor comprises a guiding track on
20 which a carriage can perform a translational motion, said carriage supporting a transverse slider body that supports said clamps and can move toward and away from said processing assemblies.

6. The apparatus according to one or more of the preceding claims, characterized in that said clamps have pusher tips at the free ends of their
25 arms.

7. The apparatus according to one or more of the preceding claims, characterized in that it comprises, for processing kegs with two eccentric valves, two heads that can be coupled to said valves and are supported by a bush that is connected to a fixed plate, said bush forming a conical seat for
30 coupling to a conical tang that is connected to the stem of the head, the head

of the body being able to perform a translational motion with respect to said bush in contrast with the action of elastic pusher means and forming a flared inlet for facilitating the coupling to said valves.

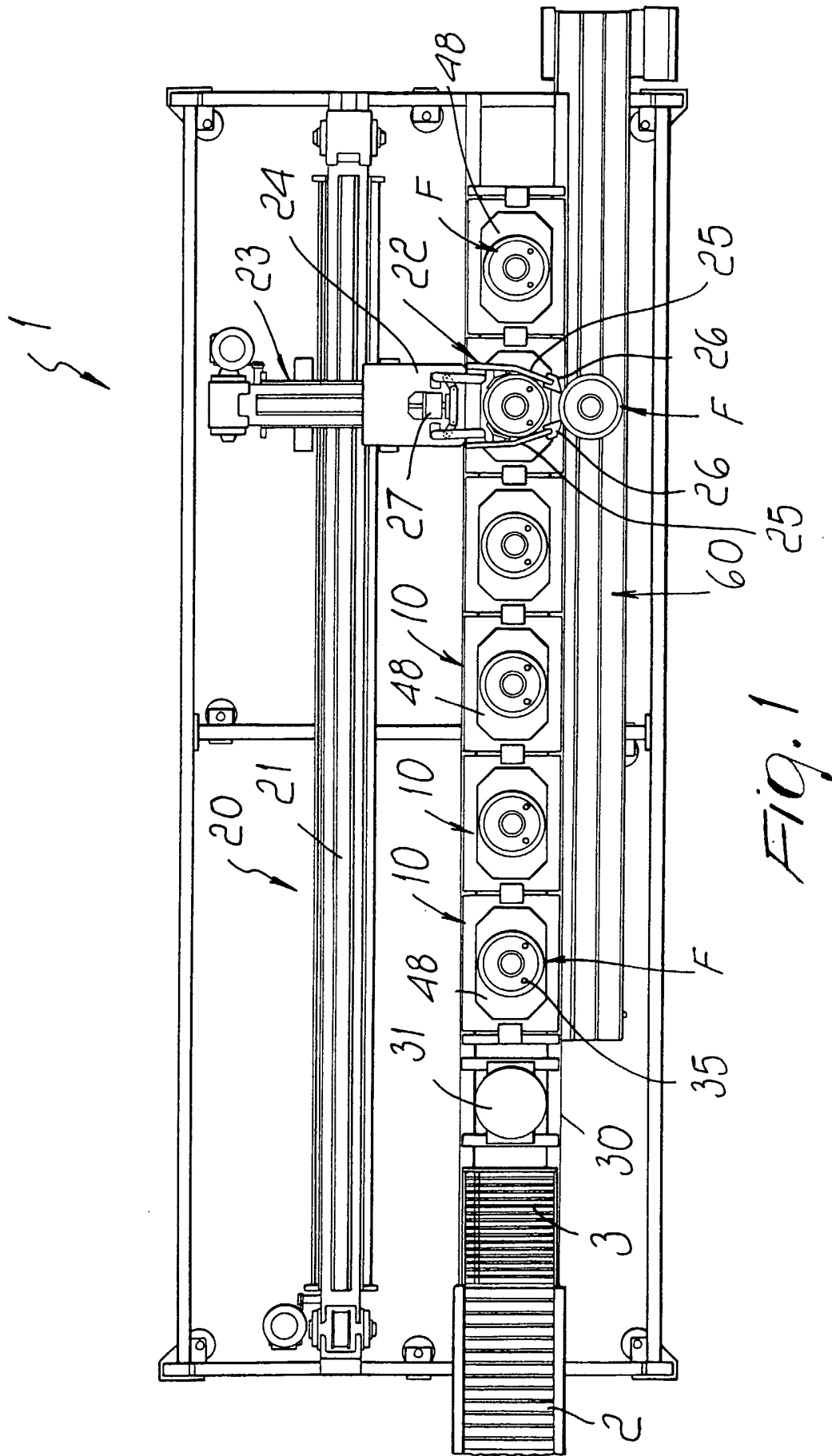
8. The apparatus according to one or more of the preceding claims, characterized in that for kegs with a central valve it comprises a lower head
5 that can be coupled to the central valve of the keg that is directed downward, there being a cage for supporting said keg, the stem of a movement piston engaging in an upper region said cage, said piston ending with a pan that can be engaged detachably by pushing with said keg and by traction with said
10 cage in order to disengage the central valve from said lower head, there being also elastic means for supporting said cage.

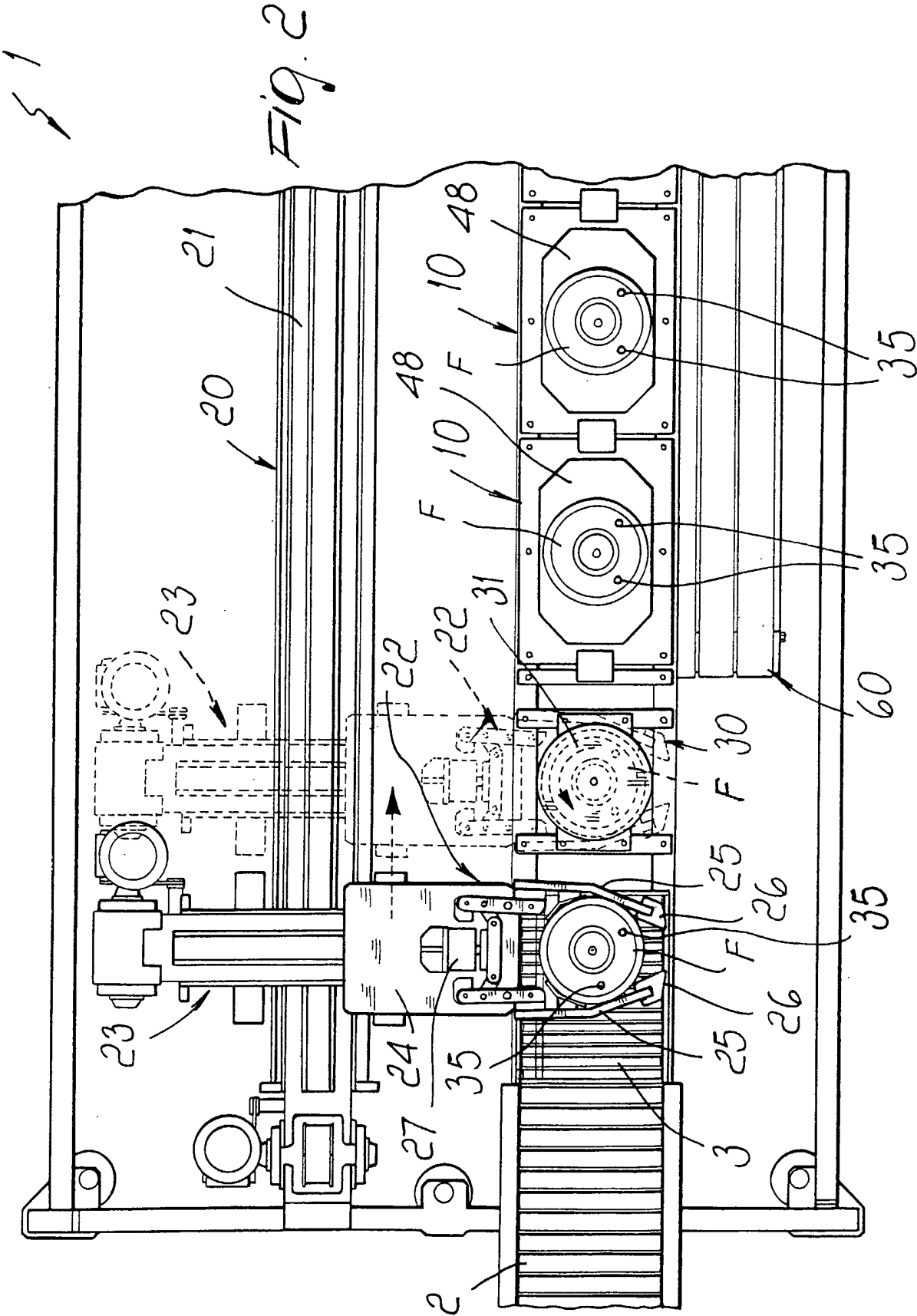
9. The apparatus according to one or more of the preceding claims, characterized in that said grip clamps are suitable to engage, by pushing, the keg arranged in the corresponding processing assembly in order to transfer it
15 onto said unloading conveyor.

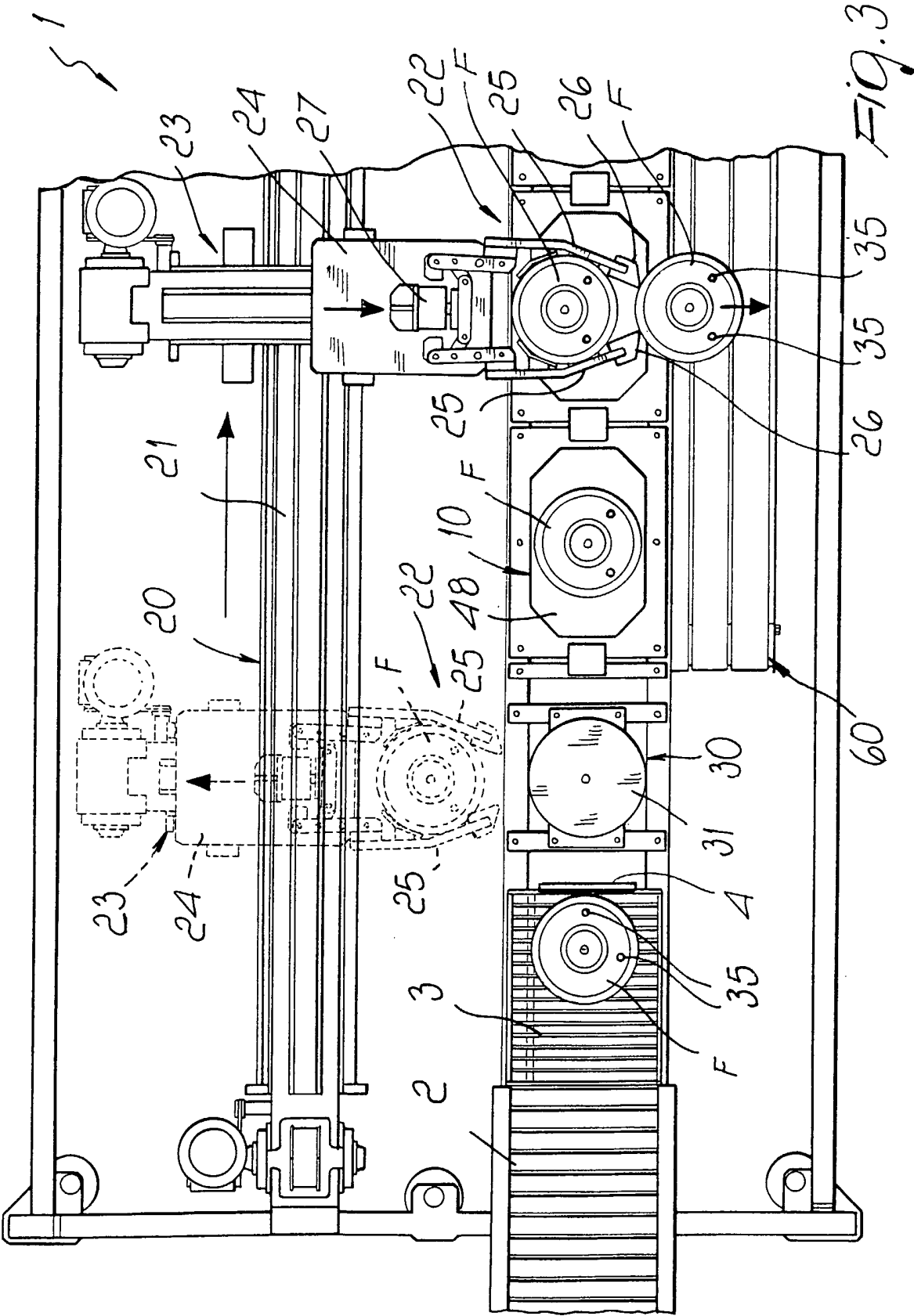
10. The apparatus according to one or more of the preceding claims, characterized in that said orientation assembly is arranged at a lower level than said keg feeder conveyor.

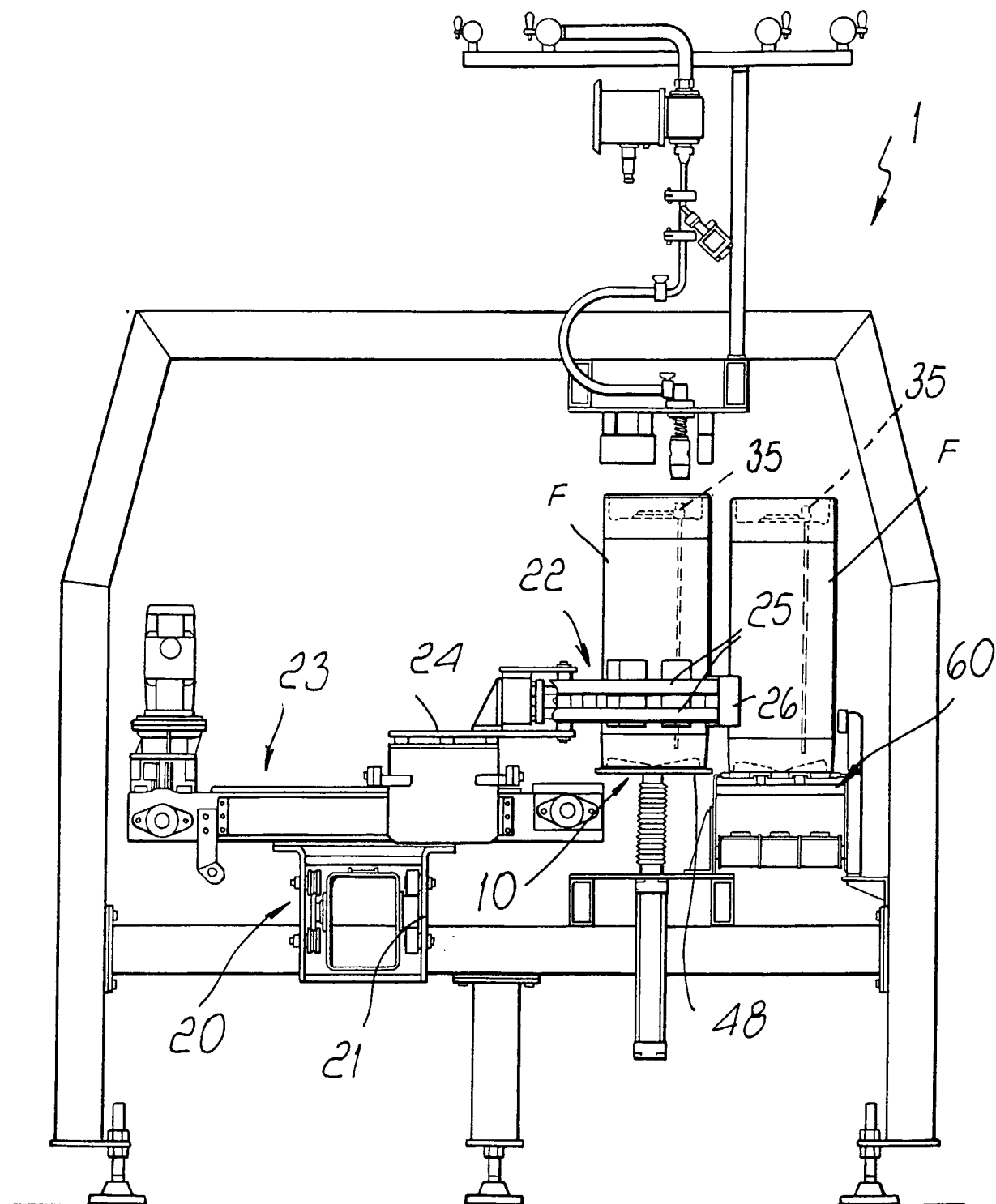
11. The apparatus according to one or more of the preceding claims, characterized in that the keg supporting surface in said processing
20 assemblies is arranged at a lower level than the supporting surface formed by said keg input conveyor and/or said orientation assembly.

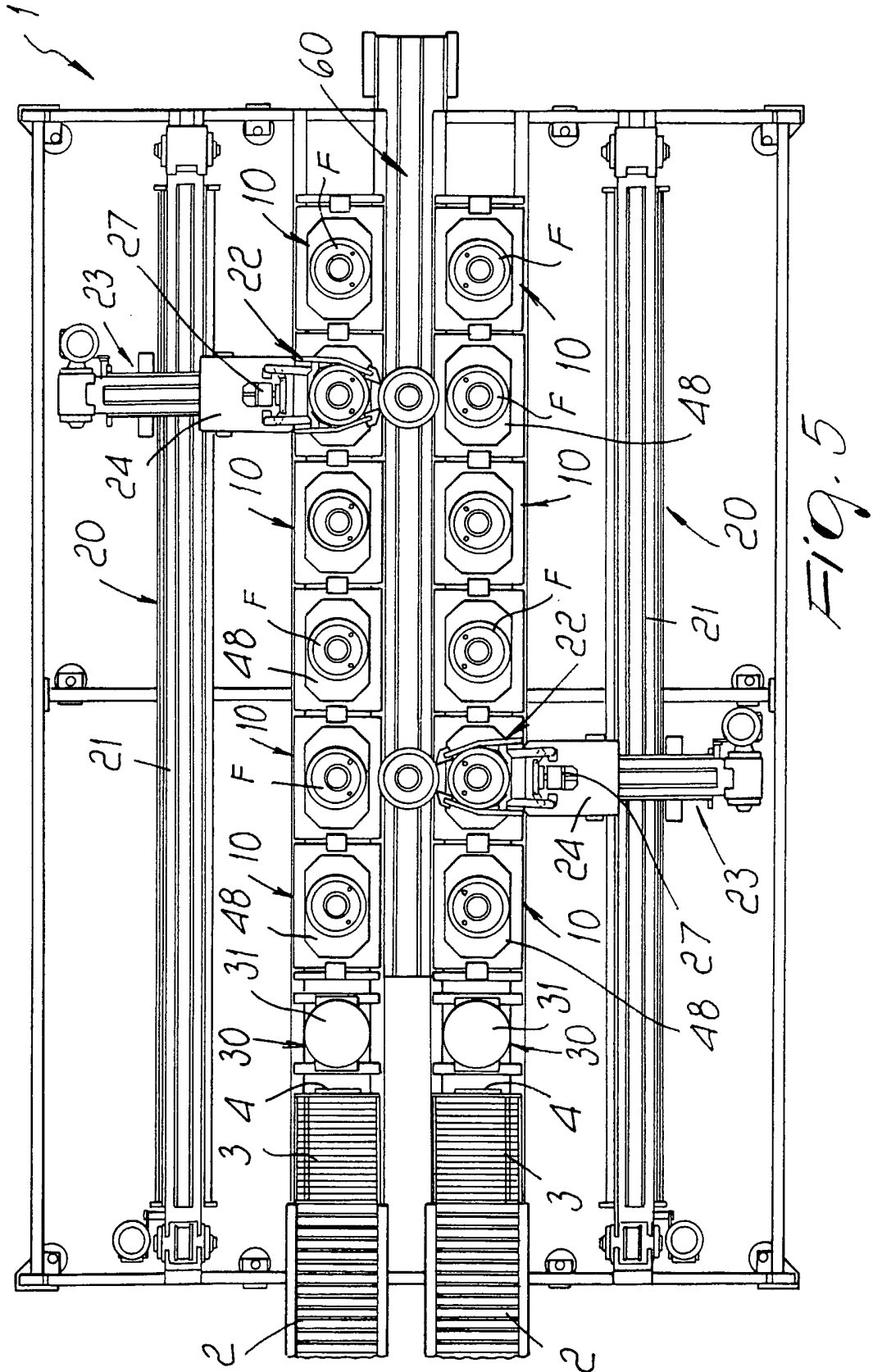
12. The apparatus according to one or more of the preceding claims, characterized in that said unloading conveyor is arranged at a lower level
25 than the surface for supporting the keg in said processing assembly.







*Fig. 4*



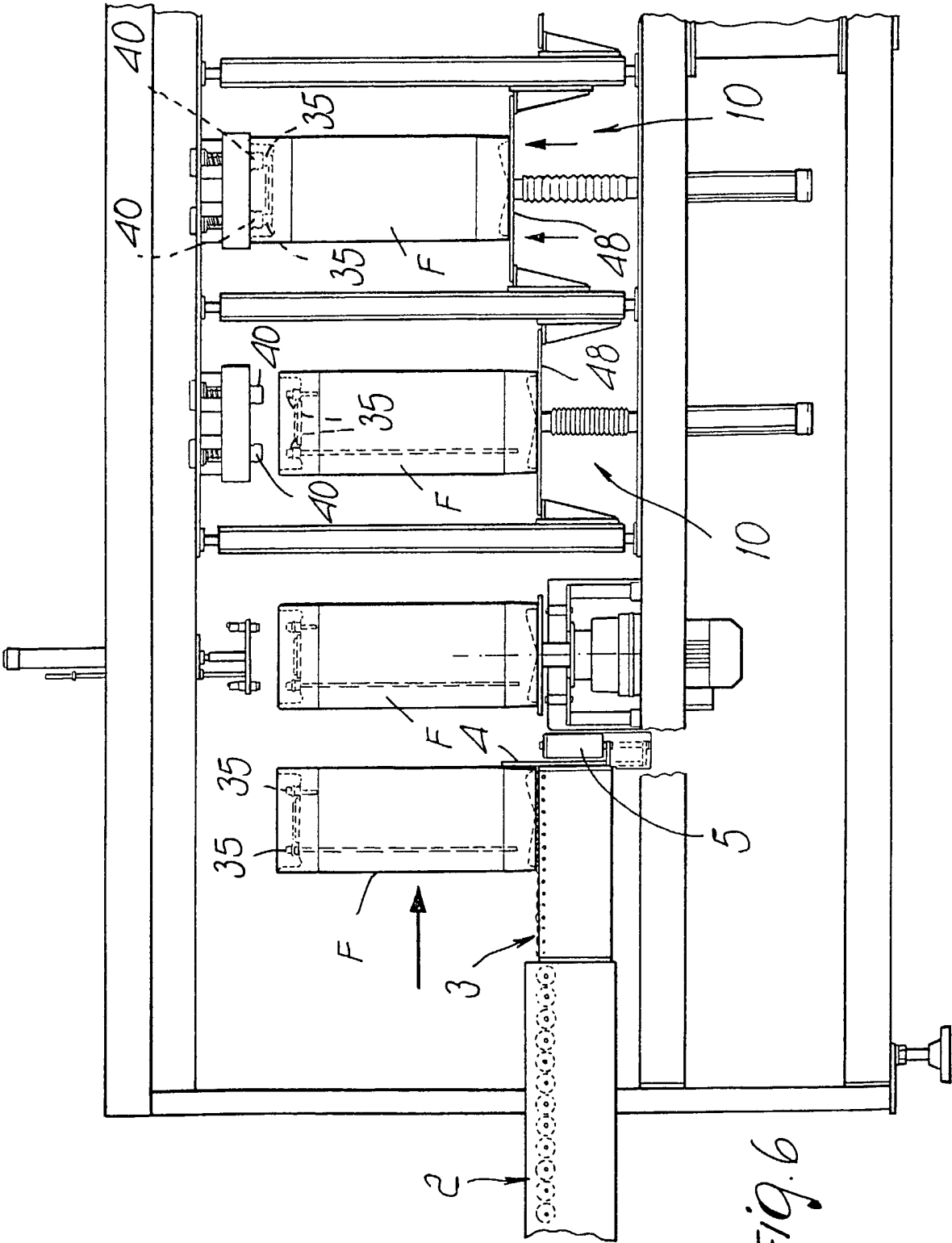
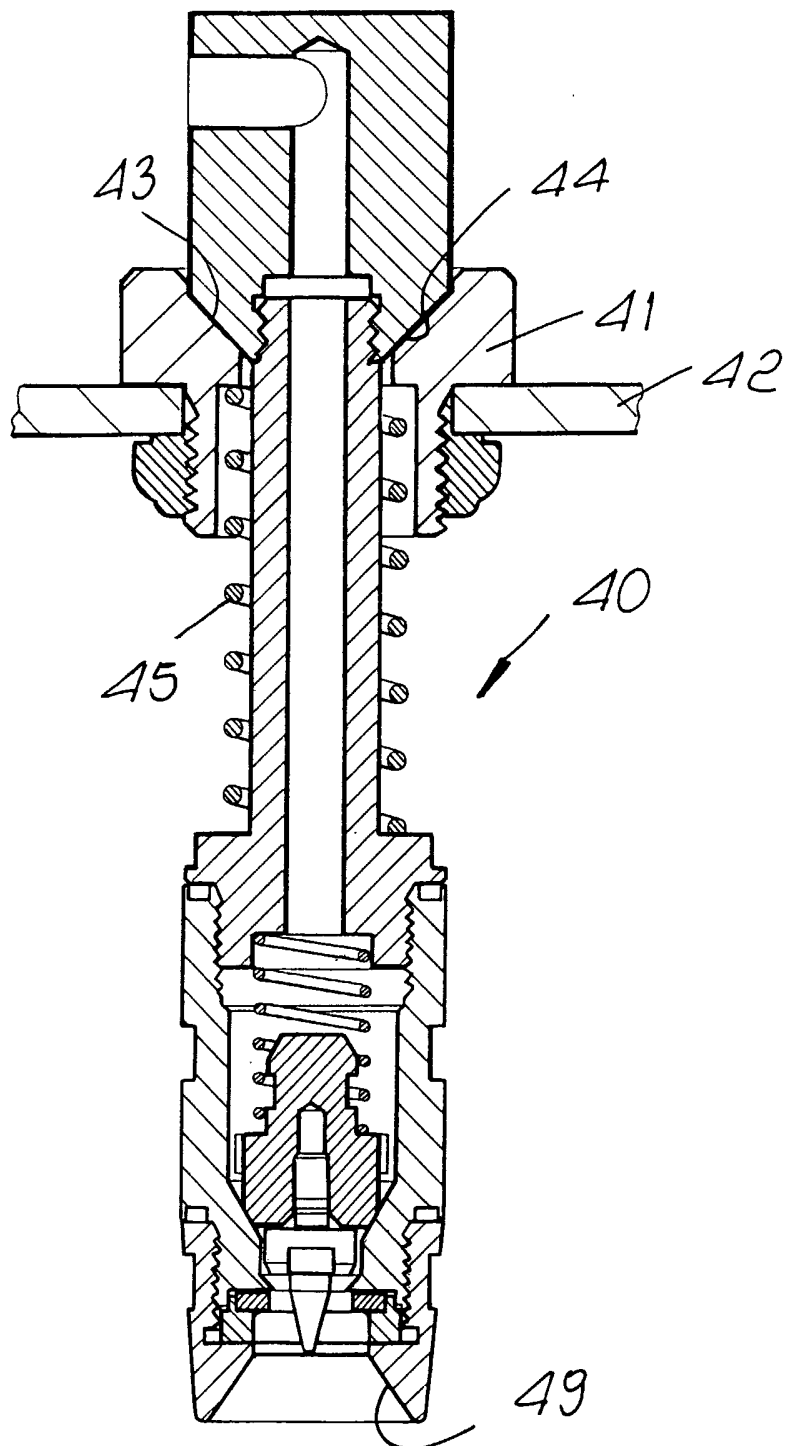
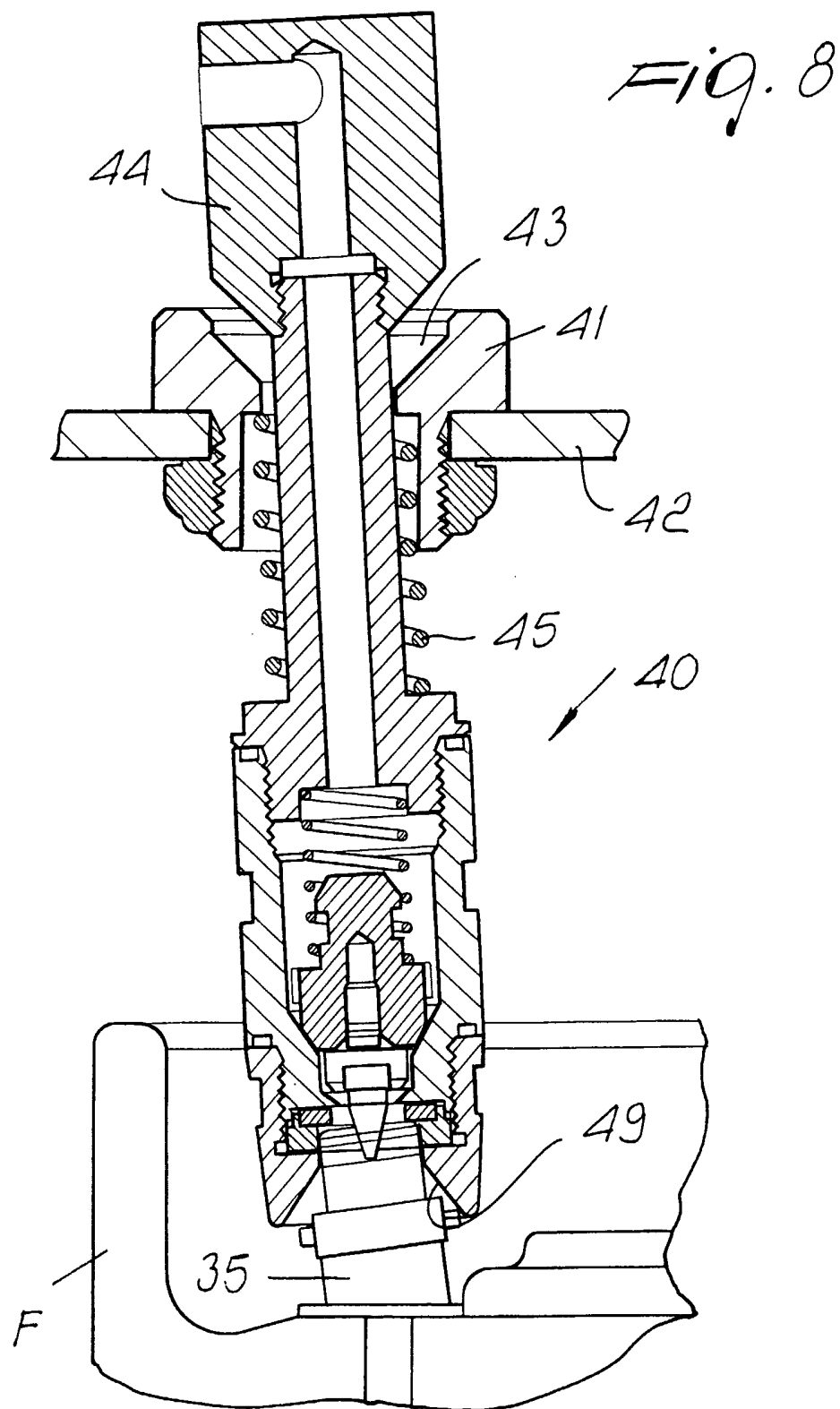


Fig. 6

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*Fig. 7*



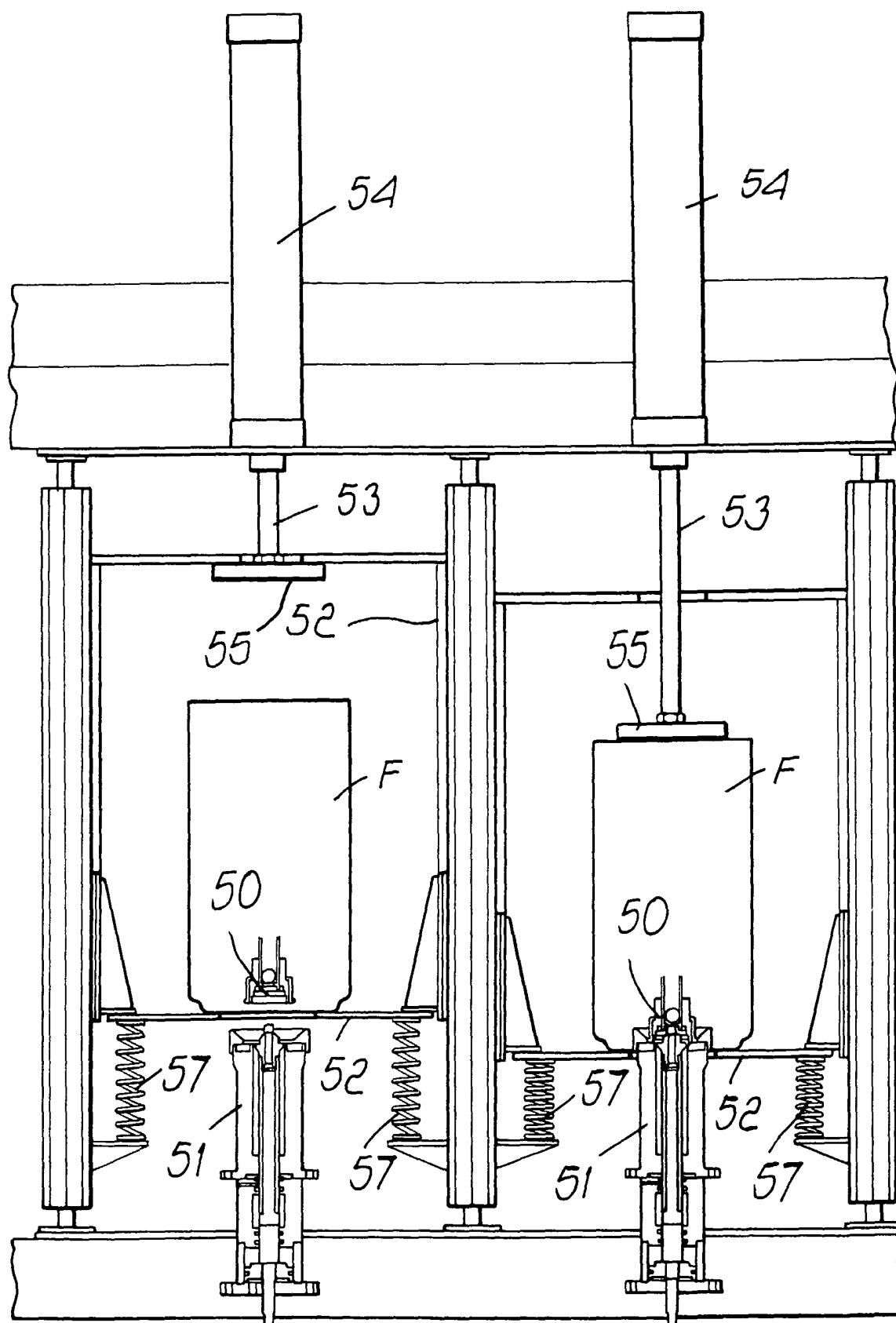


Fig. 9