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(54) Automatic straw dispensing method and device

(57) A method and device (1) for automatically dispensing straws (2), whereby a cartridge belt (11) of straws (2) - defined by a flexible belt (12) narrower than the length of the straws (2) and having a succession of transverse tubular seats (13) equally spaced along the flexible (12) and housing respective straws (2) in axially sliding manner - is fed in steps along a path (P) extending through a withdrawal station (18) where a feed device (15) and an extracting device (19) respectively provide, each time they are activated, for feeding the flexible belt (12) one step forward and sliding a straw (2a) partly along the respective tubular seat (13) into a withdrawal position.

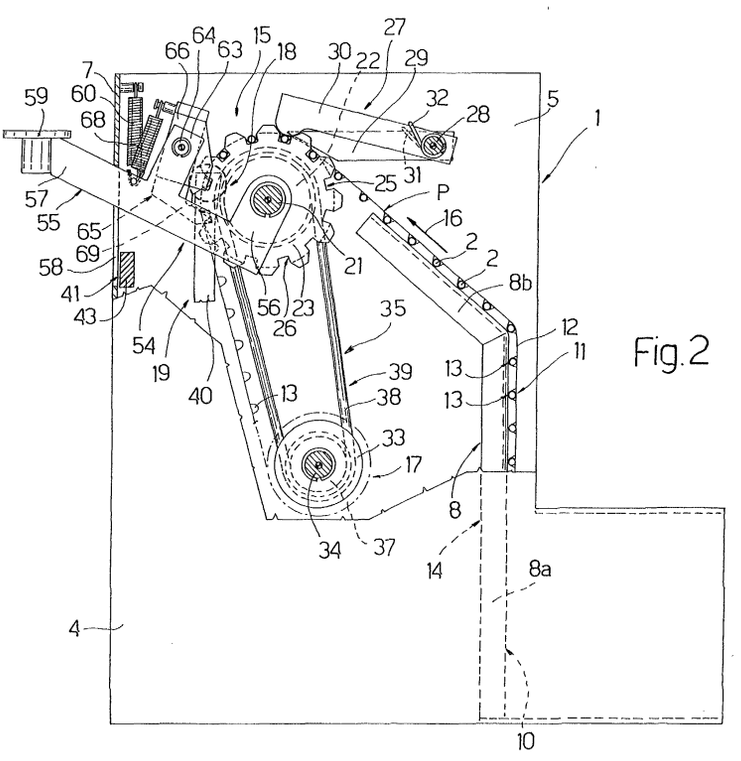

Fig.2

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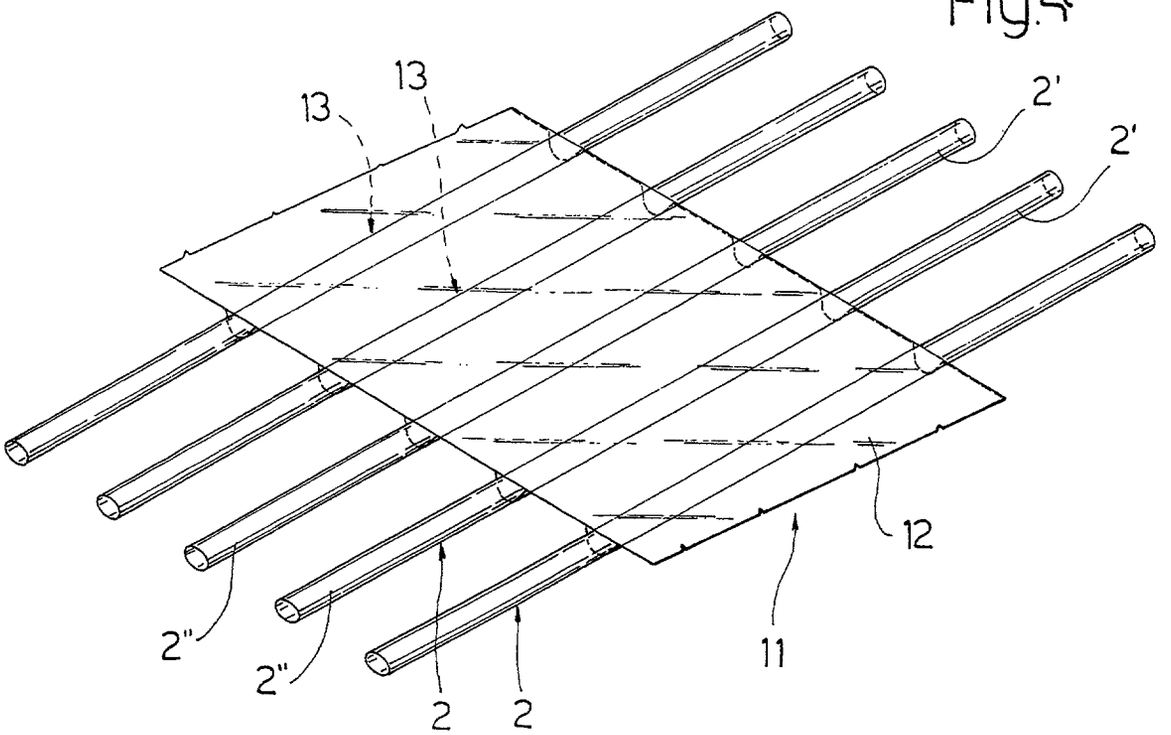
Fig.4



Description

[0001] The present invention relates to an automatic straw dispensing method.

[0002] Automatic straw dispensing normally applies to two fields: industry and catering.

[0003] In industry, straws are normally dispensed automatically to pair them with respective drink containers or similar along a container production and/or filling and/or packaging line. For which purpose, automatic straw dispensers of the type described, for example, in US-A-3,968,901 are used to withdraw a given number of straws simultaneously from a store by means of a revolver wheel, and feed the straws to respective containers fed successively along the line.

[0004] Automatic straw dispensers of the above type are obviously unsuitable for use in catering - to which the present invention refers specifically - not only in terms of complexity and cost, but also by being designed to automatically pair straws with respective containers, whereas the main function of a straw dispenser for catering purposes is to make each straw available to the user, who then assigns it to a respective container.

[0005] For this purpose, a straw dispenser has been designed of the type described, for example, in US-A-4,789,081, which comprises a container in which the straws are arranged horizontally, and a bottom wall of which projects frontwards to form a tray to which the straws are fed one at a time through an opening formed along the bottom end of the front wall of the container. To assist passage of the straws from the container to the tray, the front wall of the container has a vertical central opening through which the straws can be agitated and pushed down manually. Such a method obviously poses problems of hygiene, by the straws possibly, and normally necessarily, being touched by users prior to use.

[0006] To eliminate the above drawback, straw dispensers have been designed of the type described, for example, in WO-A-00/47500, in which the straws are arranged substantially vertically inside a container closed at the bottom by a funnel-shaped wall having an exit hole through which a single straw is fed partly. The funnel-shaped wall is connected to the container in oscillating manner, and can be oscillated one or more times by the user to agitate the straws inside the container so that one drops partly through the exit hole. Such a method has several drawbacks, by each straw dropping through the exit hole at random and normally requiring repeated, and often improper, intervention by the user.

[0007] It is an object of the present invention to provide an automatic straw dispensing method which is straightforward and cheap to implement, and which provides for eliminating the aforementioned drawbacks.

[0008] According to the present invention, there is provided a method of automatically dispensing straws, the method comprising a succession of selectively activated cycles, each for dispensing a respective new straw, and each cycle comprising a step-feed stage wherein a cartridge belt of straws - comprising a flexible belt narrower than the length of the straws and having a succession of transverse tubular seats equally spaced with a given spacing along the flexible belt, and a number of straws housed partially in axially sliding manner inside respective said tubular seats - is fed forward one step, equal to said spacing, along a path extending through a withdrawal station; and a push stage wherein axial thrust is exerted on said new straw, stationary at the withdrawal station, to produce an axial sliding movement of the new straw along the respective tubular seat.

[0009] In a preferred embodiment of the method defined above, said sliding movement is a partial sliding movement to move said new straw into a withdrawal position wherein the new straw still engages the respective said tubular seat, but projects axially and substantially entirely from one end of the tubular seat.

[0010] More specifically, said path preferably extends inside a container having a hole located at said withdrawal station and coaxial with said new straw; said partial sliding movement making said new straw accessible from the outside through said hole.

[0011] The present invention also relates to a device for automatically dispensing straws.

[0012] According to the present invention, there is provided a device for automatically dispensing straws, the device comprising a cartridge belt of straws, in turn comprising a flexible belt narrower than the length of the straws and having a succession of transverse tubular seats equally spaced with a given spacing along the flexible belt, each said tubular seat being engaged in axially sliding manner by a respective said straw; step-feed means for feeding said flexible belt in constant steps, each equal to said spacing, along a path extending through a withdrawal station, and for positioning a new said straw at said withdrawal station at the end of each said step; and push means located at said withdrawal station to exert axial thrust on said new straw, stationary at the withdrawal station, and produce an axial sliding movement of said new straw along the respective tubular seat.

[0013] A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a three-quarter underside view in perspective of a preferred embodiment of the straw dispensing device according to the present invention;

Figure 2 shows a larger-scale side view, with parts removed for clarity, of the Figure 1 device;

Figure 3 shows a plan view of a first detail in Figure 2;

Figure 4 shows a larger-scale view in perspective of a second detail in Figure 2;

Figure 5 shows a section along line V-V in Figure 3;

Figure 6 shows a larger-scale view of a third detail

in Figure 2;

Figures 7 and 8 show the Figure 6 detail in two different operating positions; and

Figure 9 shows a dispensing counter for a restaurant including a straw dispensing device according to the present invention.

[0014] With reference to Figures 1 to 3, number 1 indicates as a whole a device for automatically dispensing straws 2 and comprising a container 3 having two vertical parallel lateral walls 4 and 5 connected by a substantially horizontal bottom wall 6, a vertical rear wall 7 perpendicular to lateral walls 4 and 5, and an intermediate wall 8 comprising a bottom portion 8a parallel to rear wall 7, and a top portion 8b sloping towards rear wall 7.

[0015] Lateral walls 4 and 5 comprise respective low portions 9 projecting frontwards from bottom portion 8a of intermediate wall 8 to define, together with bottom wall 6 and bottom portion 8a, a reloadable chamber or store 10 for a cartridge belt 11 of straws 2, which, as shown clearly in Figure 2, comprises a flexible belt 12 narrower than the length of straws 2 and having a succession of transverse tubular seats 13 equally spaced along flexible belt 12 and housing respective straws 2 in axially sliding manner. More specifically, each straw 2 is fitted through respective tubular seat 13 so that two substantially equal end portions 2' and 2" project from opposite ends of respective tubular seat 13.

[0016] Lateral walls 4 and 5 define, together with rear wall 7, bottom wall 6 and intermediate wall 8, a chamber 14 into which cartridge belt 11 is inserted by sliding it along the outer surface of intermediate wall 8 and over the top end of sloping top portion 8b of intermediate wall 8. A top portion of chamber 14 houses a feed device 15 located between lateral walls 4 and 5 to step-feed cartridge belt 11 in a given feed direction 16 and in steps each equal to the spacing of tubular seats 13 along flexible belt 12. A bottom portion of chamber 14 houses a winding device 17 located downstream from feed device 15 in direction 16 to take up flexible belt 12. Feed device 15 defines a curved intermediate portion of a substantially upside-down U-shaped path P, a first arm of which extends upwards in direction 16 from store 10 to feed device 15, and a second arm of which extends downwards in direction 16 between feed device 15 and winding device 17 and through a withdrawal station 18 where an extracting device 19, housed inside chamber 14, exerts axial thrust on a straw 2a at withdrawal station 18 to move straw 2a partly, as explained in detail later on, with respect to respective tubular seat 13 and into a withdrawal or pickup position in which substantially the whole of end portion 2' of straw 2a engages respective tubular seat 13, and end portion 2" of straw 2a extends partly outwards of container 3 through a hole 20 formed in lateral wall 4 and coaxial with straw 2a.

[0017] With reference to Figures 2 and 3, feed device 15 comprises a horizontal shaft 21 located at withdrawal station 18 and supported in an angularly fixed position by and perpendicular to lateral walls 4 and 5. Feed device 15 also comprises a cylindrical body 22 mounted for rotation on shaft 21 and having two sprocket wheels 23 and 24 forming an integral part of cylindrical body 22 and located on opposite sides of a cylindrical track 25, which defines part of path P and is of a width approximately equal to but no smaller than the width of flexible belt 12. Cylindrical track 25 is positioned facing the top end of top portion 8b of intermediate wall 8, and is substantially tangent to a plane defined by top portion 8b.

[0018] Sprocket wheels 23 and 24 have respective sets of teeth aligned with each other and defining respective successions of cavities 26 equally spaced about the axis of shaft 21 with a linear spacing equal to the spacing of tubular seats 13 along flexible belt 12. Each cavity 26 of each sprocket wheel 24, 25 is aligned with a respective cavity 26 of sprocket wheel 25, 24, and each two aligned cavities 26 are engaged, in use, by respective end portions 2', 2" of the same straw 2 which, in use, and as it is fed along the portion of path P defined by cylindrical track 25, acts as a connecting tooth between flexible belt 12 and cylindrical body 22.

[0019] To keep flexible belt 12 in contact with cylindrical track 25 and retain straws 2 inside respective pairs of cavities 26, device 1 comprises a pressure device 27 in turn comprising a shaft 28 parallel to shaft 21 and mounted in an angularly fixed position between lateral walls 4 and 5 and over top portion 8b of intermediate wall 8, and two plates 29 and 30 mounted for rotation on shaft 28 and extending towards and over cylindrical body 22. Plate 29 is pushed by a respective spring 31 towards cylindrical track 25 to press flexible belt 12 on to cylindrical track 25, and plate 30 is pushed by a respective spring 32 towards sprocket wheel 23 to retain end portions 2" of straws 2 inside respective cavities 26 of sprocket wheel 23.

[0020] With reference to Figures 2 and 3, winding device 17 comprises a pulley 33 located beneath cylindrical track 25 and fitted to a shaft 34 parallel to shaft 21 and supported for rotation by, and projecting from, lateral wall 5. Pulley 33 is connected angularly to cylindrical body 22 by a belt drive 35 comprising a pulley 36 integral with cylindrical body 22, a pulley 37 integral with pulley 33, and an endless drive belt 38 fitted to pulleys 36 and 37.

[0021] As shown in Figure 5, extracting device 19 is supported by rear wall 7 and comprises a mechanical transmission 39, and a movable push member 40 connected to an output of transmission 39. Transmission 39 comprises an L-shaped rocker arm 41 hinged to rear wall 7 to rotate about a substantially horizontal axis 42 extending just below cylindrical track 25 and perpendicular to rear wall 7. Rocker arm 41 comprises a top arm 43, which is parallel to rear wall 7, faces lateral wall 4, and is normally maintained in a substantially horizontal position by a spring 44 stretched between a free end of top arm 43 and an attachment located on rear wall 7 and

over top arm 43; and a bottom arm 45 parallel to rear wall 7 and substantially perpendicular to top arm 43. Transmission 39 also comprises an articulated quadrilateral 46, the fixed frame of which is defined by rear wall 7, and a crank of which is defined by bottom arm 45. Articulated quadrilateral 46 also comprises a connecting rod 47, one end of which is hinged to the bottom end of bottom arm 45, and the other end of which is hinged to the bottom end of a bottom arm 48 of a rocker arm 49, a top arm of which is defined by push member 40, the projection of which on rear wall 7 is substantially aligned with the projection of bottom arm 45 on rear wall 7, and the top end of which is defined by a paddle-shaped push head 50 lying in a plane crosswise to rear wall 7. Rocker arm 49 pivots by means of an intermediate sleeve 51 on a pin 52 parallel to axis 42 and supported by rear wall 7, and is normally maintained by spring 44 in a rest position in which push member 40 rests against lateral wall 5, and push head 50 projects partly outwards of container 3 through a hole 53 formed through lateral wall 5 and coaxial with hole 20.

[0022] Feed device 15 and extracting device 19 are both user-activated by means of an intermittently activated actuating member 54 comprising an L-shaped lever 55, a first arm 56 of which is hinged to shaft 21 outwards of sprocket wheel 23 and extends downwards from shaft 21 towards rear wall 7, and a second arm 57 of which is integral with the bottom end of arm 56 and slopes upwards to engage in transversely sliding manner a vertical opening 58 formed through rear wall 7 and comprising a top portion 58a, and a bottom portion 58b which extends facing a portion of top arm 43 of rocker arm 41 of extracting device 19. Outside container 3, arm 57 terminates with a plate 59 which is pressed manually by the user to rotate lever 55 downwards and anticlockwise in Figure 2 from a normal rest position in which arm 57 is positioned contacting the top end of top portion 58a of opening 58, and in opposition to a spring 60 extending between a pin 61 integral with an intermediate point of arm 57, and a pin 62 integral with the inner surface of rear wall 7.

[0023] From the portion of arm 57 extending between pin 61 and arm 56, an appendix 63 extends upwards, substantially perpendicular to arm 57, and is fitted on the end facing wall 5 with a pin 64 parallel to shaft 21 and on which pivots a rocker-arm escapement 65 coplanar with sprocket wheel 23 and forming part of actuating member 54. Rockerarm escapement 65 comprises a top arm 66 having, on the free end, a transverse pin 67 connected by a taut spring 68 to pin 61; and a bottom arm defined by a catch 69 pushed by spring 68 to normally engage a cavity 26 of sprocket wheel 23. A plate 70 is connected integrally to escapement 65, forms part of actuating member 54, and is located between escapement 65 and appendix 63, in a position just outwards of sprocket wheel 23 along the axis of shaft 21 towards wall 4. On the side facing sprocket wheel 23, plate 70 has a cam profile 71 which, as explained in detail later on, cooperates with portion 2" of a straw 2a coaxial with hole 20 to keep catch 69 disengaged from sprocket wheel 23.

[0024] In actual use, a full cartridge belt 11 is first placed inside store 10, and one end is threaded manually along path P and over cylindrical body 22, and is connected to shaft 34. The first seats 13 on cartridge belt 11 are normally empty, and the end of cartridge belt 11 is pulled so that the first straws 2 mesh with sprocket wheels 23 and 24 upstream from withdrawal station 18.

[0025] At this point, lever 55 of actuating member 54 is lowered by manually pressing down plate 59 in opposition to spring 60, so that arm 57 of lever 55 slides along opening 58, and catch 69 of rocker-arm escapement 65 - already engaging a cavity 26 of sprocket wheel 23 (Figure 6) - rotates about the axis of shaft 21 to feed cartridge belt 11 forward one step (Figure 7). As it slides along bottom portion 58b of opening 58, arm 57 engages top arm 43 of rocker arm 41 transversely to rotate rocker arm 41 (anticlockwise in Figure 5) about axis 42 and so rotate rocker arm 49 about the axis of pin 42 to move push head 50, in opposition to spring 44, from the rest position engaging hole 53 into a thrust position contacting sprocket wheel 24.

[0026] In the event the above forward feed step of cartridge belt 11 positions a straw 2a coaxial with hole 20, push head 50, as it moves towards sprocket wheel 24, engages the free end of end portion 2' of straw 2a to push straw 2a axially along respective seat 13 into a withdrawal position wherein portion 2" of straw 2a projects axially from hole 20, while straw 2a remains partly engaged inside respective seat 13 by portion 2'.

[0027] If, for any reason, e.g. failure of transmission 39, straw 2a is not moved into the withdrawal position when arm 57 is lowered, this can be rectified by the user acting manually and directly on push head 50 through hole 53.

[0028] When released, lever 55 is restored by spring 60 to the Figure 6 raised position, thus withdrawing rocker-arm escapement 65, which rotates clockwise with respect to lever 55, and in opposition to spring 68, about the axis of pin 64 so that catch 69 passes over the tooth of sprocket wheel 23 directly upstream from the previously engaged cavity 26, and cam profile 71 of plate 70 (Figure 8) rests on the lateral surface of straw 2a in the withdrawal position.

[0029] Only when straw 2a is withdrawn manually is catch 69 allowed by spring 68 (Figure 6) to engage the cavity 26 directly upstream from the previously engaged cavity.

[0030] In the event lever 55 is activated again before straw 2a is withdrawn, this results in no forward feed of sprocket wheels 23 and 24, and hence of cartridge belt 11, owing to straw 2a cooperating with cam profile 71 and so preventing catch 69 from engaging any of cavities 26.

[0031] Figure 9 shows a dispensing counter 72 for a restaurant, e.g. a fast-food or self-service restaurant, in-

cluding the straw dispensing device 1 according to the invention.

[0032] Counter 72 is provided with a lower compartment 73 which is closable by a front door 74 and in which one or more boxes 75 containing, each, a respective cartridge belt 11 of straws 2 may be housed. Boxes 75 preferably have an internal width substantially corresponding to the length of straws 2, so as to prevent straws 2 from axially slipping out of cartridge belt 11 during transportation, as described in the Swedish patent application no. 0001263-3 of 6 April, 2000. If two side-by-side boxes 75 are used, as in the shown embodiment, respective ends of cartridge belts 11 of straws 2 may be spliced together on a slicing support 76 located inside compartment 73 in order to form a single cartridge belt 11, so as to provide device 1 with a double-capacity store.

[0033] Device 1, whose lever 55, straw-picking hole 20 and winding device 17 are visible, is located over compartment 73, so as to be directly fed by cartridge belt 11 unwinding off a box 75.

[0034] Counter 72 finally includes a top rest plane 77, on which food trays may be laid, and by which sauce dispensers 78 are conveniently provided.

Claims

1. A method of automatically dispensing straws (2), the method comprising a succession of selectively activated cycles, each for dispensing a respective new straw (2a), and each cycle comprising a step-feed stage wherein a cartridge belt (11) of straws (2) - comprising a flexible belt (12) narrower than the length of the straws (2) and having a succession of transverse tubular seats (13) equally spaced with a given spacing along the flexible belt (12), and a number of straws (2) housed partially in axially sliding manner inside respective said tubular seats (13) - is fed forward one step, equal to said spacing, along a path (P) extending through a withdrawal station (18); and a push stage wherein axial thrust is exerted on said new straw (2a), stationary at the withdrawal station (18), to produce an axial sliding movement of the new straw (2a) along the respective tubular seat (13).

2. A method as claimed in Claim 1, wherein said axial thrust is applied by a push member (40) mounted movably at said withdrawal station (18).

3. A method as claimed in Claim 2, wherein said axial thrust is applied by activating said push member (40) by means of transmission means (39) activated selectively and defining, with said push member (40), an intermittently activated extracting device (19) located at said withdrawal station (18).

4. A method as claimed in Claim 2, wherein said axial thrust is imparted by applying manual pressure directly on said push member (40).

5. A method as claimed in one of the foregoing Claims, wherein said path (P) extends between a store (10) and a winding device (17) for said flexible belt (12).

6. A method as claimed in one of the foregoing Claims, wherein said sliding movement is a partial sliding movement to move said new straw (2a) into a withdrawal position wherein the new straw (2a) still engages the respective said tubular seat (13), but projects axially and substantially entirely from one end of the respective tubular seat (13).

7. A method as claimed in Claim 6, and comprising a final withdrawal stage wherein said new straw (2a) is withdrawn completely from the respective said tubular seat (13).

8. A method as claimed in Claim 7, wherein said final withdrawal stage is a manual stage.

9. A method as claimed in Claim 8, and further comprising a disabling stage preventing a further feed step of said cartridge belt (11) in the event of failure to perform said final withdrawal stage to withdraw said new straw (2a).

10. A method as claimed in one of Claims 6 to 9, wherein said path (P) extends inside a container (3) having a hole (20) located at said withdrawal station (18) and coaxial with said new straw (2a); said partial sliding movement making said new straw (2a) accessible from the outside through said hole (20).

11. A method as claimed in one of the foregoing Claims, wherein said step-feed stage is performed by means of a toothed feed device (15) engaging said cartridge belt (11) of straws (2).

12. A method as claimed in Claim 11, wherein said toothed feed device (15) engages portions (2") of said straws (2) projecting axially from the respective said tubular seats (13).

13. A method as claimed in Claim 11 or 12, wherein said cartridge belt (11) of straws (2) is fed forward one step by means of an intermittently activated actuating member (54).

14. A method as claimed in Claims 3 and 13, wherein activation of said actuating member (54) activates said feed device (15) and said extracting device (19).

15. A device for automatically dispensing straws (2),

the device comprising a cartridge belt (11) of straws (2), in turn comprising a flexible belt (12) narrower than the length of the straws (2) and having a succession of transverse tubular seats (13) equally spaced with a given spacing along the flexible belt (12), each said tubular seat (13) being engaged in axially sliding manner by a respective said straw (2); step-feed means (15, 54) for feeding said flexible belt (12) in constant steps, each equal to said spacing, along a path (P) extending through a withdrawal station (18), and for positioning a new said straw (2a) at said withdrawal station (18) at the end of each said step; and push means (19, 55) located at said withdrawal station (18) to exert axial thrust on said new straw (2a), stationary at the withdrawal station (18), and produce an axial sliding movement of said new straw (2a) along the respective tubular seat (13).

16. A device as claimed in Claim 15, and comprising a store (10) and a winding device (17) for said flexible belt (12); said path (P) extending between said store (10) and said winding device (17).

17. A device as claimed in Claim 15 or 16, and comprising a container (3) in which said path (P) extends; said container (3) having a hole (20) located at said withdrawal station (18) and coaxial with said new straw (2a); and said push means (19, 55) comprising an extracting device (19) located at said withdrawal station (18) to selectively engage and move each said new straw (2a) axially with respect to the respective said tubular seat (13) from a backed-up position inside said container (3) into a withdrawal position wherein a portion (2") of said new straw (2a) engages said hole (20) and is accessible from outside said container (3).

18. A device as claimed in one of Claims 15 to 17, wherein said step-feed means (15, 54) comprise a toothed feed device (15) engaging said cartridge belt (11) of straws (2).

19. A device as claimed in Claim 18, wherein said toothed feed device (15) engages, in use, said cartridge belt (11) of straws (2) by end portions (2', 2") of said straws (2) projecting axially from the respective said tubular seats (13).

20. A device as claimed in Claim 18 or 19, wherein said toothed feed device (15) comprises two sprocket wheels (23, 24), and a cylindrical body (22) coaxial and integral with said sprocket wheels, and located between the sprocket wheels (23, 24) to rotate, together with the sprocket wheels, about a first axis (21) crosswise to said path (P); said cylindrical body (22) defining a cylindrical track (25) for said flexible belt (12); and each said sprocket wheel (23; 24) engaging, in use, respective end portions (2'; 2") of said straws (2).

21. A device as claimed in Claim 20, wherein said step-feed means (15, 54) comprise intermittently activated first actuating means (54) located at said withdrawal station (18) to activate said toothed feed device (15); said first actuating means (54) comprising an escapement (65) for engaging a first said sprocket wheel (23), and a lever (55) mounted to oscillate about said first axis (21) and supporting said escapement (65).

22. A device as claimed in Claim 21, wherein said container (3) has an opening (58), and said lever (55) projects partly outwards of said container (3) through said opening (58), which is engaged by the lever (55) in transversely sliding manner; first elastic means (60) being interposed between said lever (55) and said container (3) to normally keep the lever (55) inside a first end portion (58a) of said opening (58); and said lever (55) being movable about said first axis (21) towards a second end portion (58b) of said opening (58) and in opposition to said first elastic means (60).

23. A device as claimed in Claim 21 or 22, wherein said escapement (65) is fitted to said lever (55) to oscillate, with respect to the lever (55), about a second axis (64) parallel to said first axis (21); second elastic means (68) being interposed between said escapement (65) and said lever (55) to move a catch (69) of said escapement (65) towards said first sprocket wheel (23) and into engagement with the first sprocket wheel (23).

24. A device as claimed in Claims 17 and 23, wherein cam means (70), for cooperating with said new straw (2a), are carried by said escapement (65) to prevent said catch (69) from further engaging said first sprocket wheel (23) when said new straw (2a) is in said withdrawal position.

25. A device as claimed in one of Claims 17 to 24, wherein said extracting device (19) comprises a mechanical transmission (39) in turn comprising an input member (41) and an output member (49); said output member (49) comprising a push head (50) located at said withdrawal station (18) and movable from a rest position to a push position, in opposition to third elastic means (44), to selectively engage and move each said new straw (2a) axially with respect to the respective said tubular seat (13) from said backed-up position into said withdrawal position.

26. A device as claimed in Claim 25, wherein said push head (50) is fitted to said container (3) to oscillate

between said rest position and said push position about a third axis (52) crosswise to said first axis (21).

27. A device as claimed in Claim 25 or 26, wherein said output member (49) is fitted to said container (3) in a position accessible from the outside to permit manual operation of said push head (50) to move the push head (50) into said push position.

28. A device as claimed in one of Claims 25 to 27, wherein said input member (41) comprises an arm (43) mounted to oscillate about a fourth axis (42) crosswise to said first axis (21); said push means (19, 55) comprising intermittently activated second actuating means (55) for moving said arm (43) from a rest position to a work position in opposition to said third elastic means (44).

29. A device as claimed in Claims 22 and 28, wherein said arm (43) extends crosswise to said opening (58) and is mounted to oscillate, between said rest position and said work position, in front of said second end portion (58b) of said opening (58); said second actuating means being defined by said lever (55).

30. A device as claimed in one of Claims 16 to 29, wherein a transmission (35) connects said step-feed means (15, 54) and said winding device (17).

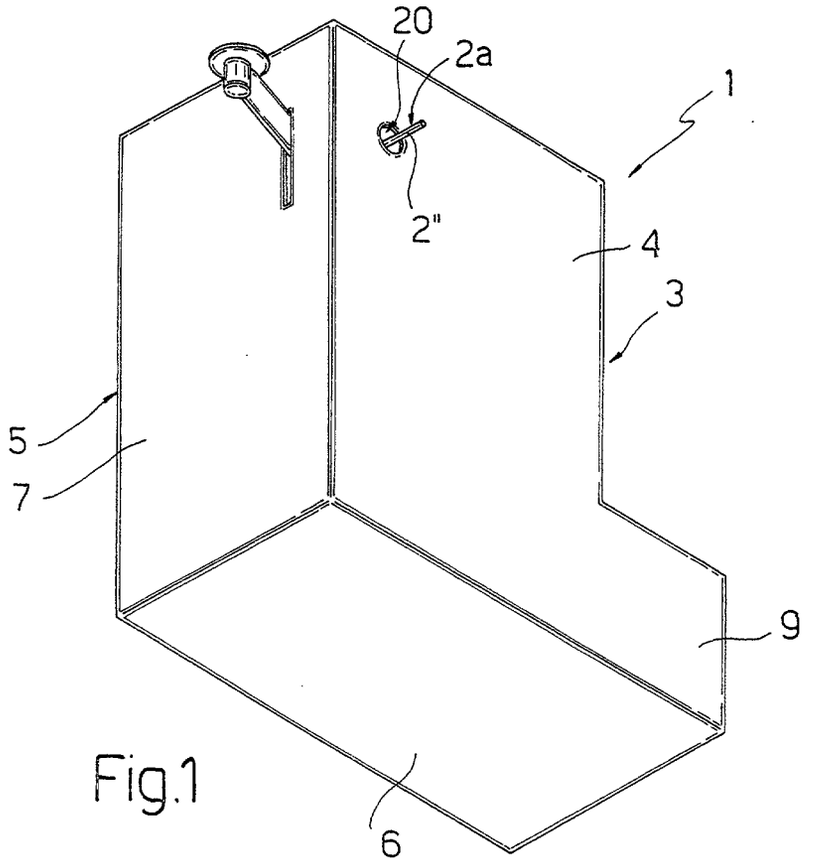


Fig.1

Fig.4

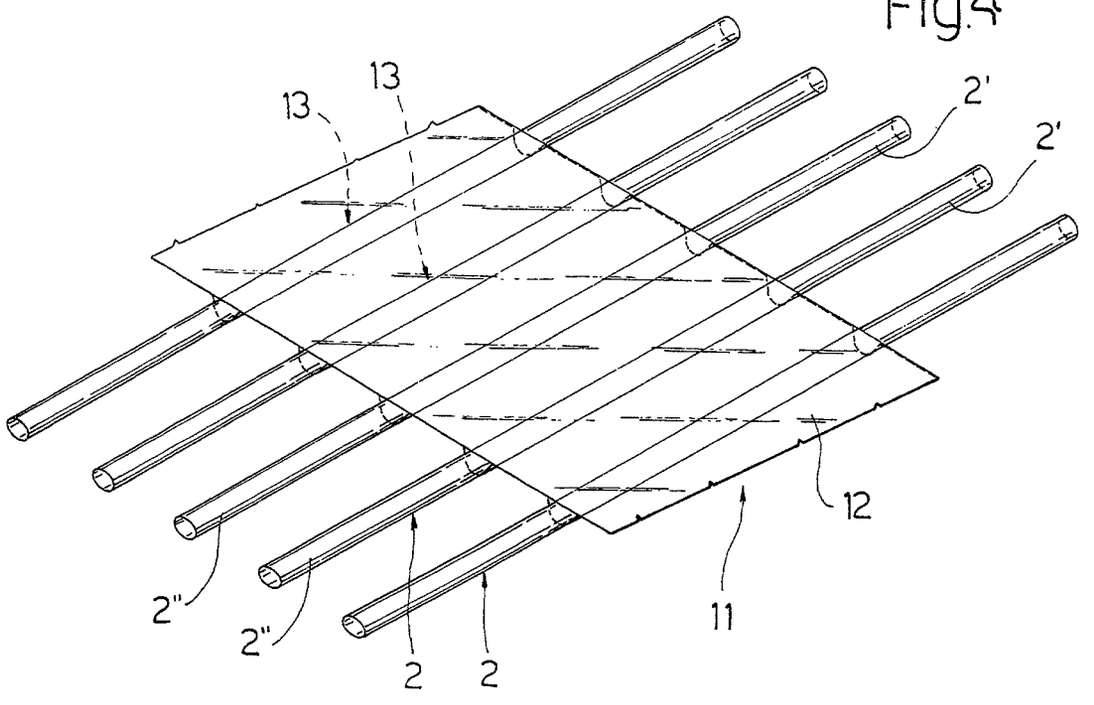


Fig.2

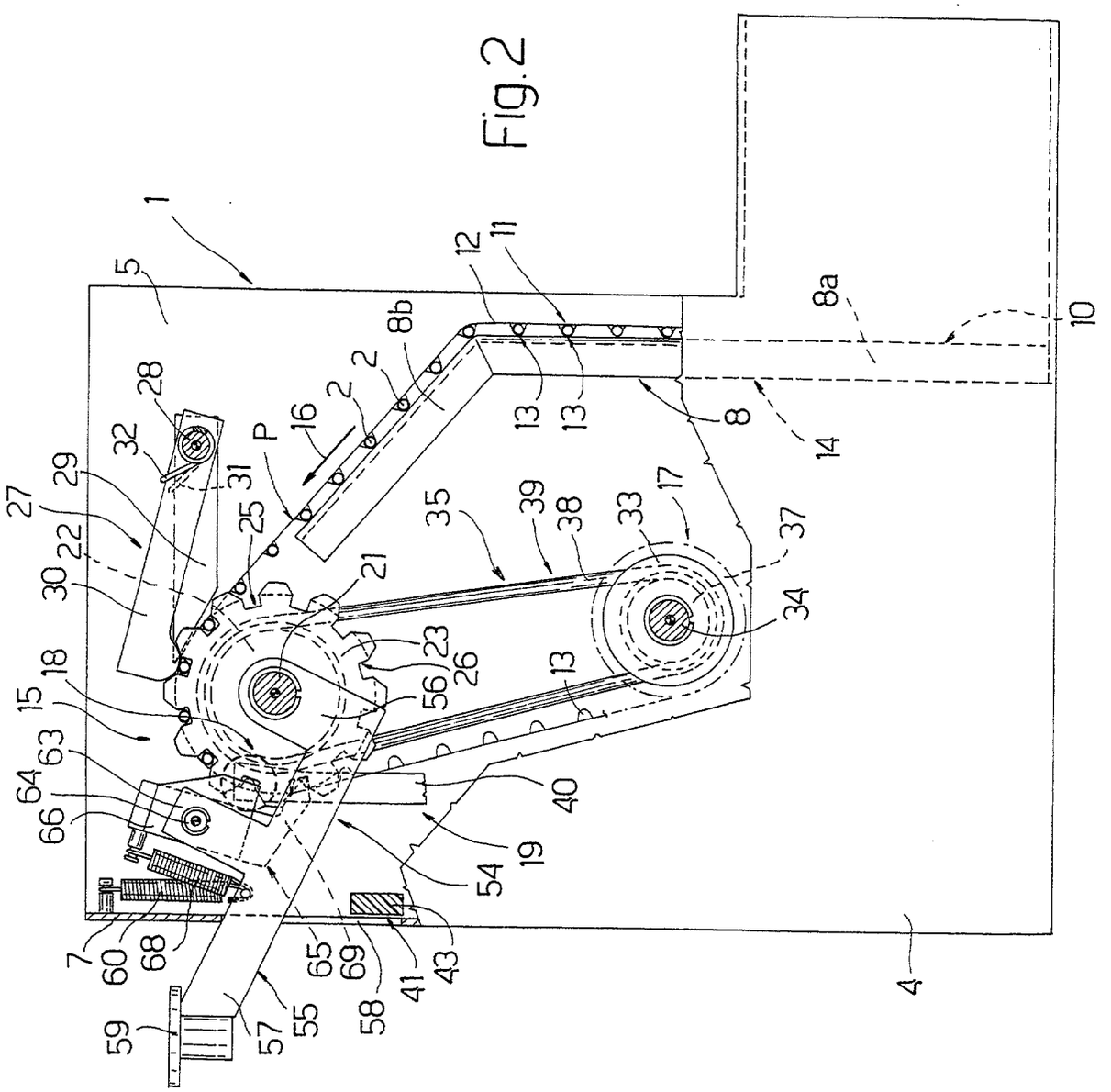

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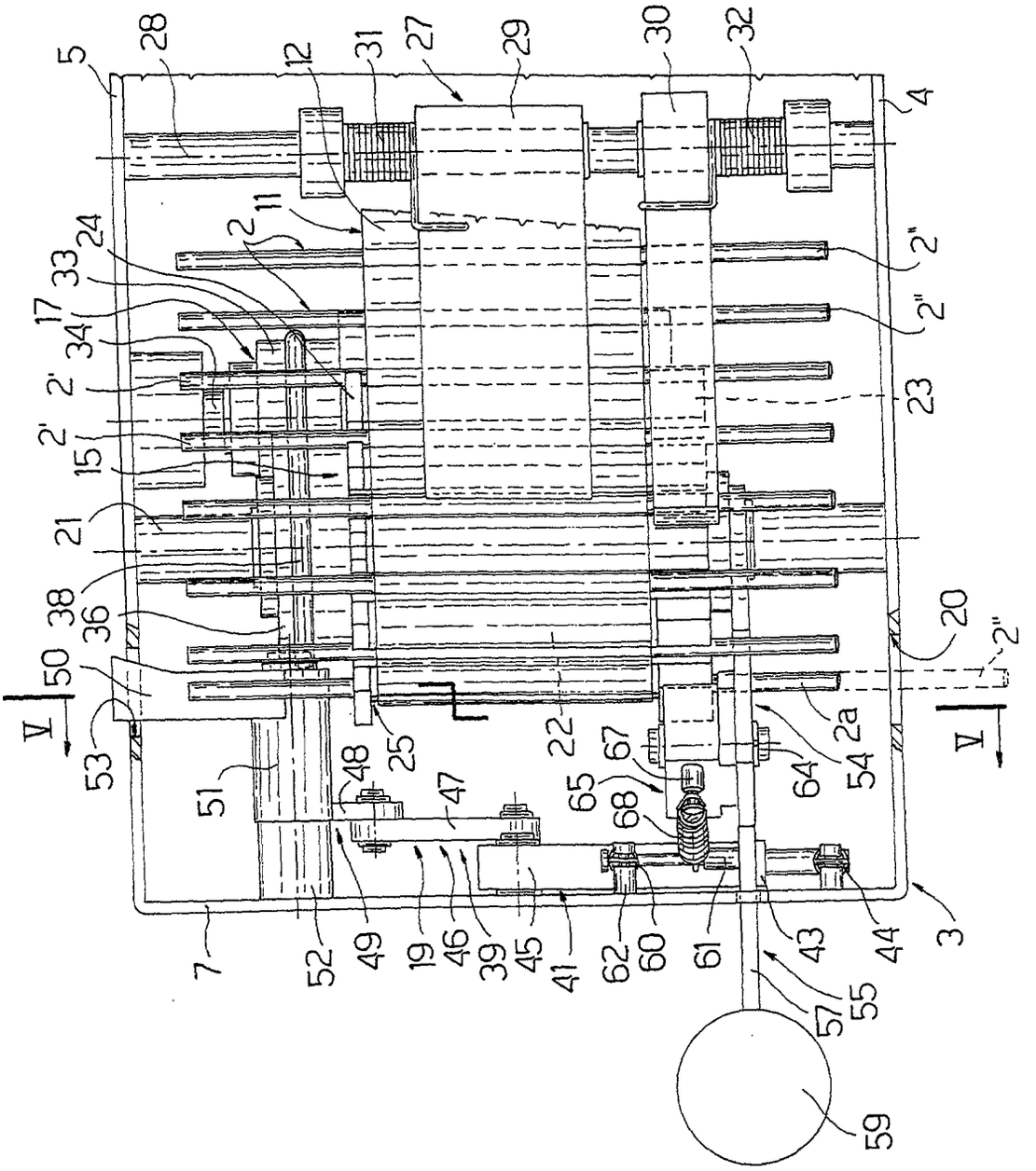
Fig.3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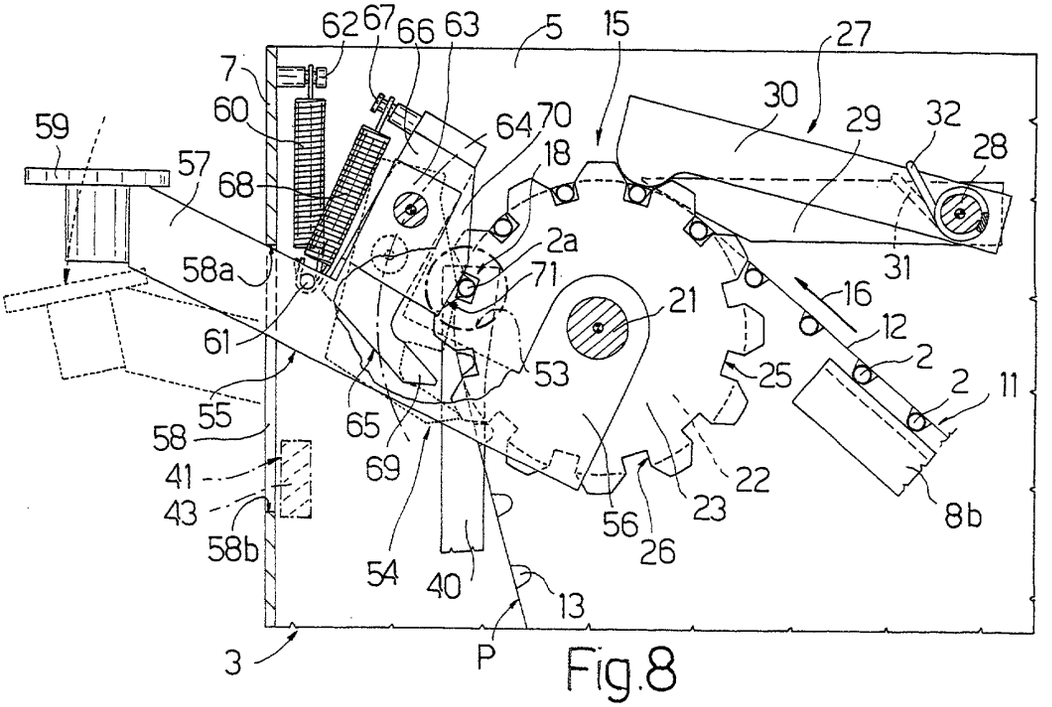
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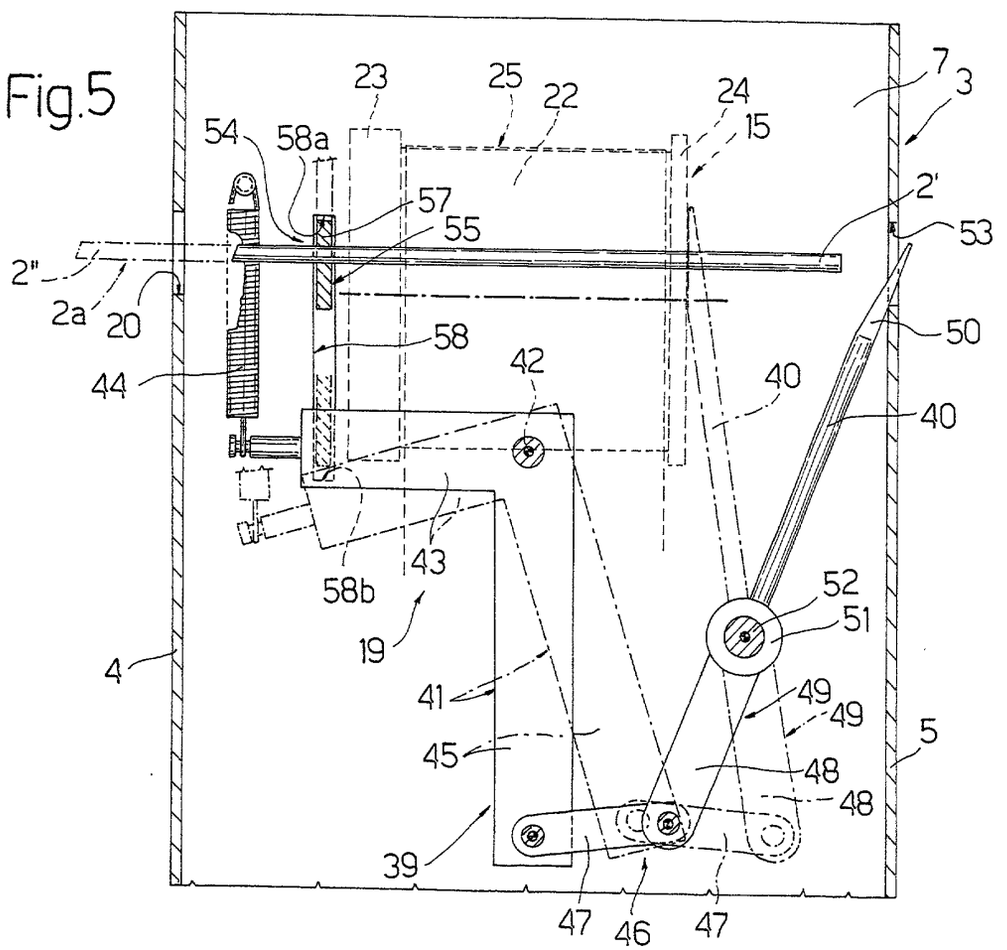
Fig.8

Fig.5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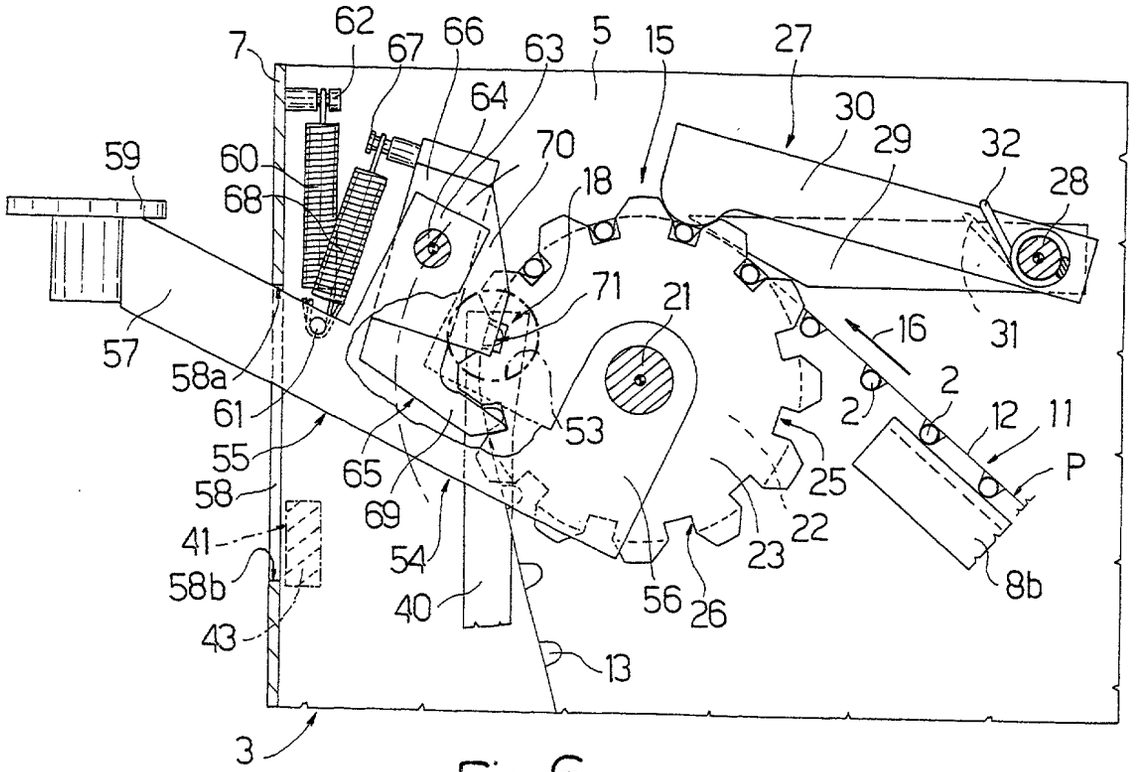
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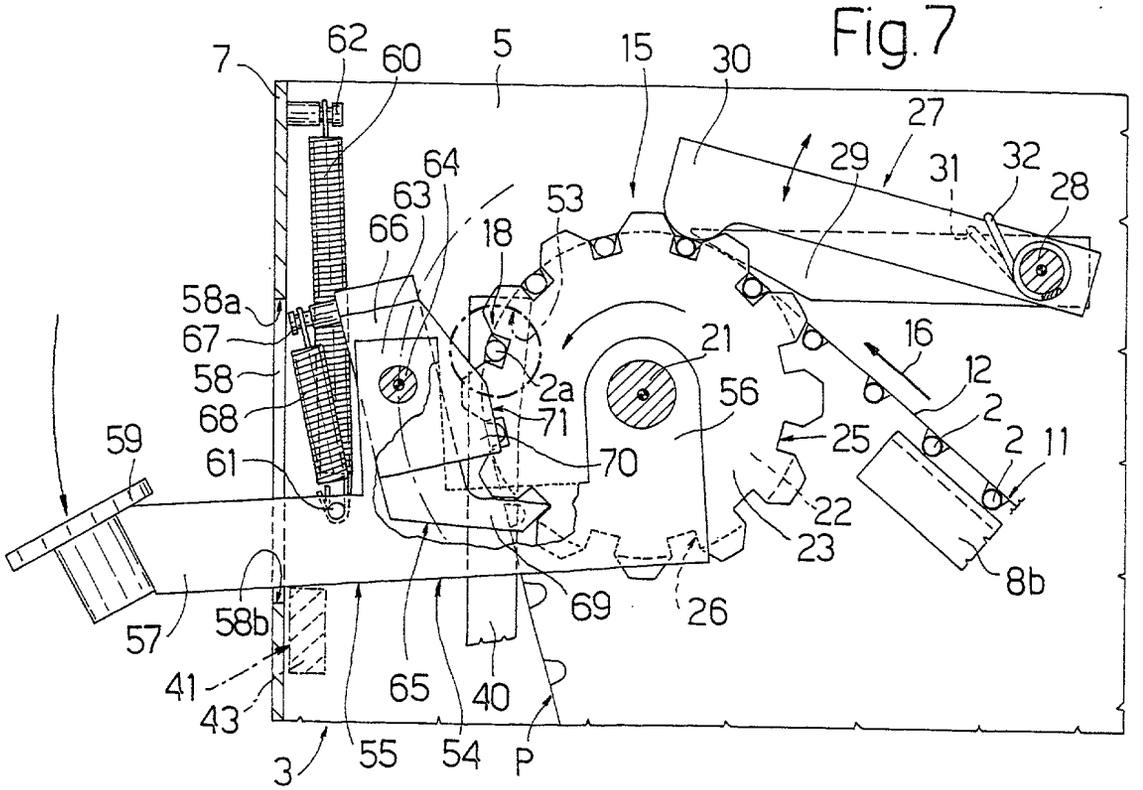
Fig.6

Fig.7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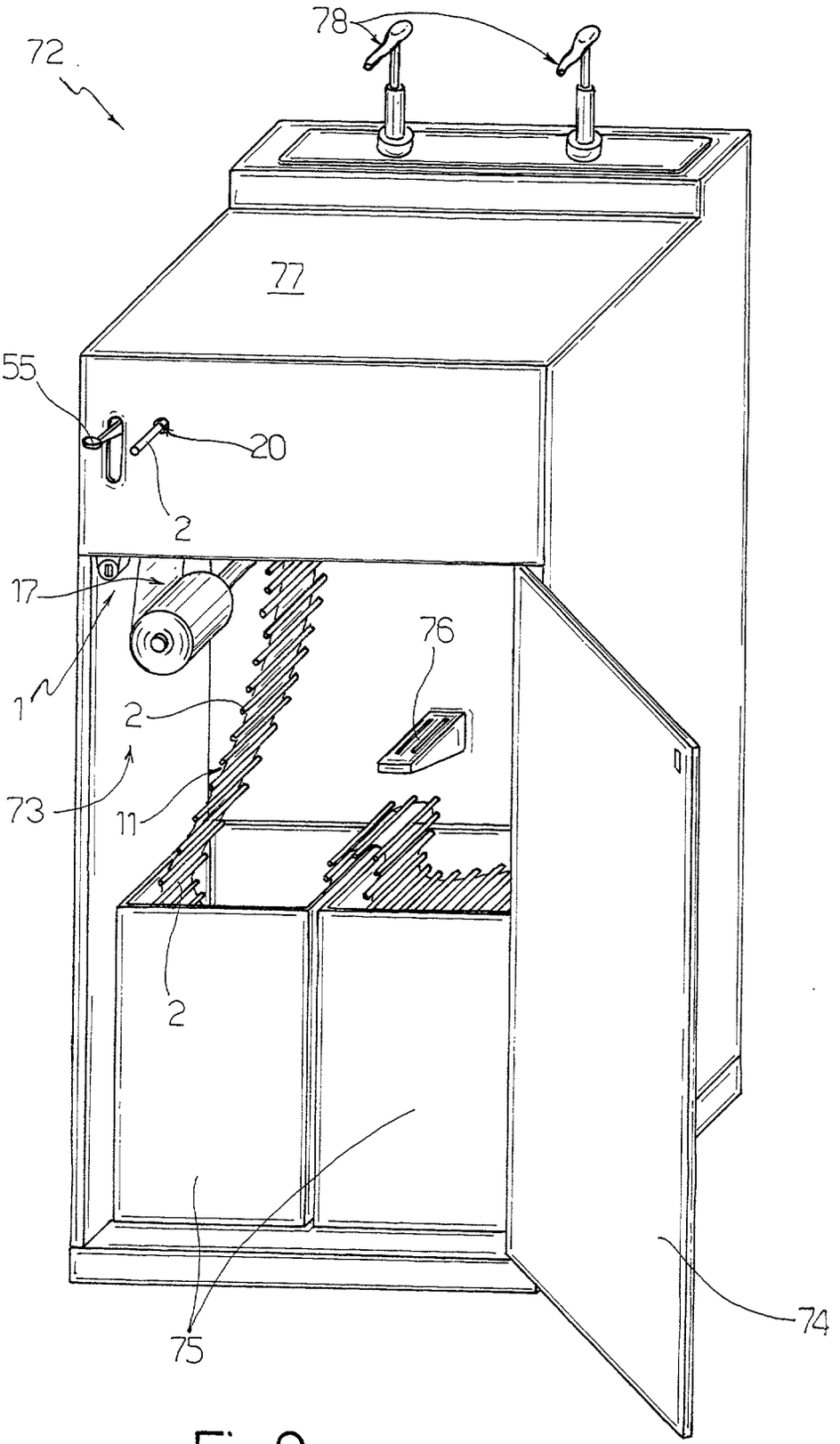

Fig.9

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EUROPEAN SEARCH REPORT

Application Number
EP 01 11 1851

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A	US 3 519 166 A (THOMAS O. YINGST ET AL.) 7 July 1970 (1970-07-07) * abstract * * column 5, line 24 - column 6, line 15; figures 1-5 *	1-9, 14-17, 25,26,30	B65D83/02 A47F1/12 A47G21/18
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	7 November 2001	Cuny, J-M

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