

EUROPEAN PATENT SPECIFICATION

- ④ Date of publication of patent specification: **30.03.88** ⑤ Int. Cl.⁴: **B 65 B 1/18, B 65 B 43/26**
⑥ Application number: **86200042.9**
⑦ Date of filing: **10.01.86**

⑧ **Universal equipment for filling valve bags.**

⑨ Priority: **10.01.85 NL 8500052**

⑩ Date of publication of application:
16.07.86 Bulletin 86/29

⑪ Publication of the grant of the patent:
30.03.88 Bulletin 88/13

⑫ Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

⑬ References cited:
DE-A-2 056 678
DE-A-2 332 845
FR-A-2 504 494

⑭ Proprietor: **Bates Cepro B.V.**
Fort Willemweg 1
NL-6219 PA Maastricht (NL)

⑮ Inventor: **Dekker, Loek J.**
Baanstraat 156
NL-6372 AJ Landgraaf-Schaesberg (NL)

⑯ Representative: **Kooy, Leendert Willem et al**
OCTROOBUREAU VRISENDORP & GADE
P.O. Box 266
NL-2501 AW The Hague (NL)

EP 0 187 689 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European patent convention).

Description

The invention relates to equipment for erecting and filling valve bags, consisting of a bag supply device, a device provided with a beak for opening and forming the valve, and an erecting clamp for transferring the empty bag from the beak to a filling tube of a filling device.

Such equipment is known from FR—A—2 504 494. In the known equipment the erection clamp has to be kept stationary during the filling of the bag. It will therefore take a considerable time before a new filling can be started. Besides the known equipment cannot be used for dangerous products, because the filling tube is horizontal.

The aim of the invention is to provide equipment for completely automatically filling and sealing both paper and plastic valve bags in various embodiments, i.e. sealed, as well as glued, block bottom and sewn, and with various filling systems, both induced by gravity (filling tube), with air transport or mechanical transport (e.g. a propellor). By applying single or multi-walled sealed plastic valve bags, so-called sole-bags or pinch-bottom valve bags respectively, a completely sealed packing is obtained, complying with Bundesbahn and UN specifications respectively, for granular or powdered products up to hazard class 8 (Caustic soda NaOH and the like).

Particularly the fact that during filling no personnel has to come near the machine is an important advantage of the present invention. Main characteristics of the invented equipment are that the beak is supported in a beak frame and is displaceable in three mutually perpendicular planes in order to transfer the bag to the erecting clamp which is reciprocable in an erecting clamp vertical plane, and that the filling device is provided with a turntable which can be rotated by a filling tube position-changing device about a centre line being at an angle in the order of 45° to the horizontal in a filling tube perpendicular plane of the equipment, said turntable carrying two or a multiple of two filling tubes, each filling tube extending substantially horizontally in the erected position and substantially vertically in the filling position, and that a sealing device is provided for sealing the valve.

With said measures, a gain of time is obtained in the working of the equipment, since it is as if an interim station has been put between erecting and filling.

Preferably the turntable is supported by means of rollers in relation to a substantially equally large stationary disc and adjacent to a supply tube a seal is provided in the stationary disc which frictionally engages the turntable.

During the handling of health-hazardous products it is also of major importance that the filling opening is open only if a bag is suspended from the filling tube. In the invented equipment, the critical moment only occurs when the bag is released and the moment when the turntable

rotates, during which it is of major importance that the filling opening is sealed by the disc.

Preferably the sealing device is provided with a sealing portion having a discharge valve. The filling device can also be provided with a bag seat, the bottom of which is at an angle to the horizontal, and if the discharge valve slopes downwardly towards a bag discharge chute, a shunting hill-resembling device or discharge drop door is obtained which causes the filled bags to come out on account of the gravity.

In an efficient embodiment the filling tube vertical plane is at an angle of about 30° to an erection clamp vertical plane of the erecting device. With this measure, space-saving of the entire equipment is obtained.

The invention will be further elucidated herebelow on the basis of the drawing, in which as an example a number of embodiments of equipment according to the invention is shown. In the drawing,

Fig. 1 illustrates a schematic side view of the equipment except for the sealing device,

Fig. 2 illustrates a schematic plan view of the equipment of fig. 1 but then inclusive of the sealing device,

Fig. 3 shows a cross-section according to the line III—III of figures 2 and 4,

Fig. 4 illustrates a cross-section according to the line IV—IV of fig. 3,

Fig. 5 illustrates a cross-section according to the line V—V of fig. 4,

Figures 6 A and B illustrate a side view of two embodiments of the filling device, and

Fig. 7 illustrates a view of the sealing device in the direction of the arrows VII—VII of fig. 2.

The equipment shown in the drawing consists of a bag supply device 100 for supplying empty bags from a bag storage magazine, a device 200 for opening and forming the valve of the bag, an erecting device 300 for transferring an empty bag to a filling device 400, a sealing device 500 for sealing the valve of a filled bag, and a bag-ejecting device.

The bag supply device 100 is generally illustrated by figures 1 and 2, while a few details have been made visible in a larger scale in figures 3 and 4.

In figures 1 and 2 the empty bags are supplied from a roll R, but this can also be replaced by another known supply of empty bags, e.g. a supply in packages. Since this is not important to the invention, this matter will not be discussed any further.

The bag supply device 100 is provided with a supply upper belt 1 and a supply lower belt 6 between which the empty bags in figures 1—3 are supplied from the left to the right and in fig. 4 from the top to the bottom.

The supply belt 1 is supported in the lower section by a guide table 5 and extends about a return roller 3 and a pressure roller 4 which is urged by a hold-down cylinder 2.

The hold-down cylinder 2 is supported to a frame 7 by a cylinder pivot 8 which frame also

supports a cylinder unit 9 and a linear guide 10 of the device 200 for opening and forming the valve.

The supply lower belt 6 extends according to fig. 3 about a return roller 11 driven by for example an electro motor 22. This moves the empty bags to a table 21, whereby they are guided by a guiding means 23, and a photo cell 12 situated above the table 21 is activated.

The table 21 is provided with a stationary suction-pad 20 which can cooperate with a movable upper suction-pad 14 which is connected to a cylinder 13 for reciprocating said pad, operated by the photo cell 12 mentioned before.

The device 200 for opening and forming the valve essentially comprises a beak 19 mounted on a supporting frame 17. The beak 19 is reciprocable along vertical linear guides 18 in the supporting frame 17 by a beak cylinder 15. The supporting frame 17 itself is linearly reciprocable in the direction of the longitudinal centre line of the equipment by a linear/guide drive 16 (fig. 3).

In this way beak 19 is inserted into the valve of the bag and subsequently moves from the left to the right over the linear guide 10.

Figures 4 and 5 show that the erection device 300 comprises an erecting clamp 24 which is mounted on a linear guide/drive 25 in order to transfer the bag in an erecting clamp vertical plane A (fig. 2 and 4) to a filling tube 31/32 of the filling device 400, wherein a curve roll 27 connected to the erecting clamp and a curve track 26 attached to the frame 7 cooperate in order to rotate the valve before it is placed onto the filling pipe. The erecting clamp 24 is provided with a bag support or underframe 28 which supports the bag during the erection movement and which is provided with a drive 29 for performing its closing movement. The upper portion of the erecting clamp is provided with a similar drive 30.

The filling device 400 shown in fig. 6A has two filling tubes 31 and 32 which are joined to a turntable 38 by connecting flanges 33. The turntable can be rotated by a drive 40, and is supported by means of rollers in relation to a stationary disc 37 which is connected to a chute tube flange 35. A seal (not shown) is mounted about the outlet of the chute tube, said outlet frictionally engaging the turntable 38. The chute tube flange 35 can be connected through a corresponding flange 36 to any chute tube 39. It is also possible to connect the stationary disc 37 to another filling system 45 by a connecting option 34 indicated by a dotted line.

The filling tubes 31 and 32 extend alternately essentially horizontally in the erection position and essentially vertically in the filling position under the influence of a filling tube position-changing device (not shown). The fact that there are two filling tubes results in a gain of time during filling. The passage through the stationary disc 37 and the turntable 38 nearly is open only if a bag is suspended from the filling tube 31 and 32. This is a matter of switch technology which is not further elucidated here.

The axis of rotation L of the turntable 38 is in a

vertical plane B and is at an angle α with respect to the horizontal H. The angle α preferably is in the order of 45°. In the straight filling tubes of fig. 6A the filling tube vertical plane B will coincide with the erection clamp vertical plane A of the erection device 300.

In an embodiment in which the filling tube plane B is at an angle in the order of 30° to the erection clamp plane A (fig. 2), some space-saving for the equipment as a whole can be expected. Then it is necessary to embody the filling tubes 31/32 in the manner shown in fig. 6B.

In fig. 6B the filling tube 31/32 is connected to a ring clamp 42 by a rubber bellows and the portion between the ring clamp 42 and the connecting flange 33 is connected to a branch conduct 43 for the bellows and a suction conduct 44.

The closing device 500 shown in fig. 7 consists of a vibrating unit 46 being mounted under a bottom 47 of a bag seat Z which supports the bag in a bag seat frame 52 during filling through the filling tube 31/32.

The bag seat Z furthermore has a side 49 and a bag bottom support 50 and the structure is reciprocable by means of linear guide/drive 48. During its descent the bag, and thus also the valve thereof, is cleared from the filling tube. In order to be able to automatically empty the bag in case of wrong filling, a cylinder 51 is provided which operates the bottom lid of the bag seat.

A transport clamp 57 with pertaining drive cylinder 56 and linear guide 58 transfers the filled bag to a sealing member S, where the valve can be sealed in any manner, e.g. ultrasonic welding, heat sealing or hotmelt.

A plate 47a prevents a filled and sealed bag to slide back into the bag seat Z after said bag has been released by the transport clamp 57.

In fig. 7 the sealing part S consists of a welding horn/anvil 59 with pertaining cutting device, welding unit 61 respectively. The sealed bag then rests on a discharge drop door 54 of a bag ejecting device which is tiltable by a discharge cylinder 53 or other linear drive in the direction of a bag discharge chute 60. When processing health-hazardous substances it is useful to cover the sealing part S by a protective plate 55.

Thus the sealing device 500 has between the bag seat Z and the sealing part S a shunting hill-resembling device or discharge drop door 54 causing the sealed bags to come out on account of the gravity.

Claims

1. Equipment for erecting and filling valve bags, consisting of a bag supply device (100), a device (200) provided with a beak (19) for opening and forming the valve, and an erecting clamp (24) for transferring the empty bag from the beak to a filling tube (31, 32) of a filling device (400), characterized in that the beak (19) is supported in a beak frame (17) and is displaceable in three mutually perpendicular planes in order to transfer the bag to the erecting clamp (24) which is

reciprocable in an erecting clamp vertical plane (A), in that the filling device (400) is provided with a turntable (38) which can be rotated by a filling tube position-changing device about a centre line (L) being at an angle in the order of 45° to the horizontal (H) in a filling tube vertical plane (B) of the equipment, said turntable carrying two or a multiple of two filling tubes (31, 32) mounted diametrically to the center line, each filling tube extending substantially horizontally in the erected position and substantially vertically in the filling position, and in that a sealing device is provided for sealing the valve.

2. Equipment as in claim 1, characterized in that the turntable is supported by means of rollers in relation to a substantially equally large stationary disc (37) and in that adjacent to a supply tube (39) a seal is provided in the stationary disc which frictionally engages the turntable.

3. Equipment as in claim 1 or 2, characterized in that the sealing device (500) is provided with a sealing portion (S) having a discharge valve (54).

4. Equipment as in claim 3, characterized in that the filling device is provided with a bag seat (v), the bottom (47) of which is at an angle to the horizontal (H), and in that the discharge drop door (54) slopes downwardly towards a bag discharge chute (60) when in its discharging position.

5. Equipment as in one of the previous claims, characterized in that the filling tube vertical plane (B) is at an angle of about 30° to an erection clamp vertical plane (A) of the erecting device (300).

Patentansprüche

1. Vorrichtung zum Aufrichtung und Füllen von Ventilsäcken, bestehend aus einer Sackzuführeinrichtung (100), einer mit einem Schnabel (19) versehenen Einrichtung (200) zum Öffnen und Formen des Ventils und einer Aufrichtklemme (24) zum Überführen des leeren Sackes von dem Schnabel zu einem Füllstutzen (31, 32), einer Fülleinrichtung (400), dadurch gekennzeichnet, daß der Schnabel (19) in einem Schnabelrahmen (17) gehalten ist und in drei zueinander senkrechten Ebenen verschiebbar ist, um den Sack zu der Aufrichtklemme (24) überzuführen, die in einer Aufrichtklemmen-Vertikalebene (A) hin- und herbeweglich ist, daß die Fülleinrichtung (400) mit einer Drehscheibe (38) versehen ist, die durch eine Einrichtung zur Änderung der Position des Füllstutzens um eine Mittellinie (L) gedreht werden kann, die unter einem Winkel von etwa 45° zur Horizontalen (H) in einer Füllstutzen-Vertikalebene (B) der Vorrichtung liegt, wobei die Drehscheibe zwei oder ein Mehrfaches von zwei Füllstutzen (31, 32) trägt, die diametral zur Mittellinie angeordnet sind, und sich jeder Füllstutzen im wesentlichen horizontal in der aufgerichteten Stellung und im wesentlichen vertikal in der Abfüllstellung erstreckt, und daß eine Versiegelungseinrichtung zum Versiegeln des Ventil vorgesehen ist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Drehscheibe mittels Rol-

len gegenüber einer im wesentlichen gleichgroßen stationären Scheibe (37) gehalten ist und daß angrenzend an ein Zufuhrrohr (39) eine Dichtung der stationären Scheibe vorgesehen ist, die Reibschluß mit der Drehscheibe hat.

3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Versiegelungseinrichtung (500) mit einem Versiegelungsteil (S) versehen ist, der ein Ausgabeventil (54) aufweist.

4. Vorrichtung nach Anspruch 3, dadurch gekennzeichnet, daß die Fülleinrichtung mit einer Sackaufnahme (Z) versehen ist, deren Boden (47) in einem Winkel zur Horizontalen (H) angeordnet ist und daß die Ausgabebodenklappe (54) nach unten zu einer Sackausgaberrutsche (60) abfällt, wenn sie sich in der Ausgabe position befindet.

5. Vorrichtung nach einem der vorausgehenden Ansprüche, dadurch gekennzeichnet, daß die Füllstutzen-Vertikalebene (B) unter einem Winkel von etwa 30° zu einer Aufrichtklemmen-Vertikalebene (A) der Aufrichteinrichtung (300) liegt.

Revendications

1. Matériel de dressage et de remplissage de sacs à valve, composé d'un dispositif d'amenée de sac (100), d'un dispositif (200) muni d'un bec (19) pour ouvrir et façonner la valve et d'une pince de dressage (24) pour le transfert du sac vide du bec au tube de remplissage (31, 32) d'un dispositif de remplissage (400), caractérisé en ce que le bec (19) est supporté dans un bâti de bec (17) et est déplaçable dans trois plans perpendiculaires entre eux afin de transférer le sac à la pince de dressage (24) qui est mobile à va-et-vient dans un plan vertical de pince de dressage (A), en ce que le dispositif de remplissage (400) est pourvu d'une table tournante (38) qui peut tourner sous l'action d'un dispositif de changement de position de tube de remplissage autour d'une médiane (L) faisant un angle de 45° avec l'horizontale (H) dans un plan vertical de tube de remplissage (B) du matériel, ladite table tournante portant des tubes de remplissage (31, 32) au nombre de deux ou d'un multiple de deux montés diamétralement par rapport à la médiane, chaque tube de remplissage s'étendant à peu près horizontalement en position de dressage et à peu près verticalement en position de remplissage, et en ce qu'un dispositif de scellage est prévu pour sceller la valve.

2. Matériel selon la revendication 1, caractérisé en ce que la table tournante est supportée au moyen de galets par rapport à un disque fixe à peu près aussi grand (37) et en ce que près d'un tube d'amené (39) il est prévu dans le disque fixe un joint d'étanchéité qui porte à frottement contre la table tournante.

3. Matériel selon la revendication 1 ou 2, caractérisé en ce que le dispositif de scellage (500) est pourvu d'une partie de scellage (S) comportant une vanne d'évacuation (54).

4. Matériel selon la revendication 3, caractérisé en ce que le dispositif de remplissage présente un siège de sac (v), dont le fond (47) fait un angle avec l'horizontale (H), et en ce que la porte

5

10

15

20

25

30

35

40

45

50

55

60

65

abattante d'évacuation (54) est en pente vers le bas en direction d'une goulotte d'évacuation de sacs (60) lorsqu'elle est en position d'évacuation.

5. Matériel selon l'une des revendications pré-

cédentes, caractérisé en ce que le plan vertical (B) du tube de remplissage fait un angle d'environ 30° avec un plan vertical de pince de dressage (A) du dispositif de dressage (300).

5

10

15

20

25

30

35

40

45

50

55

60

65

5

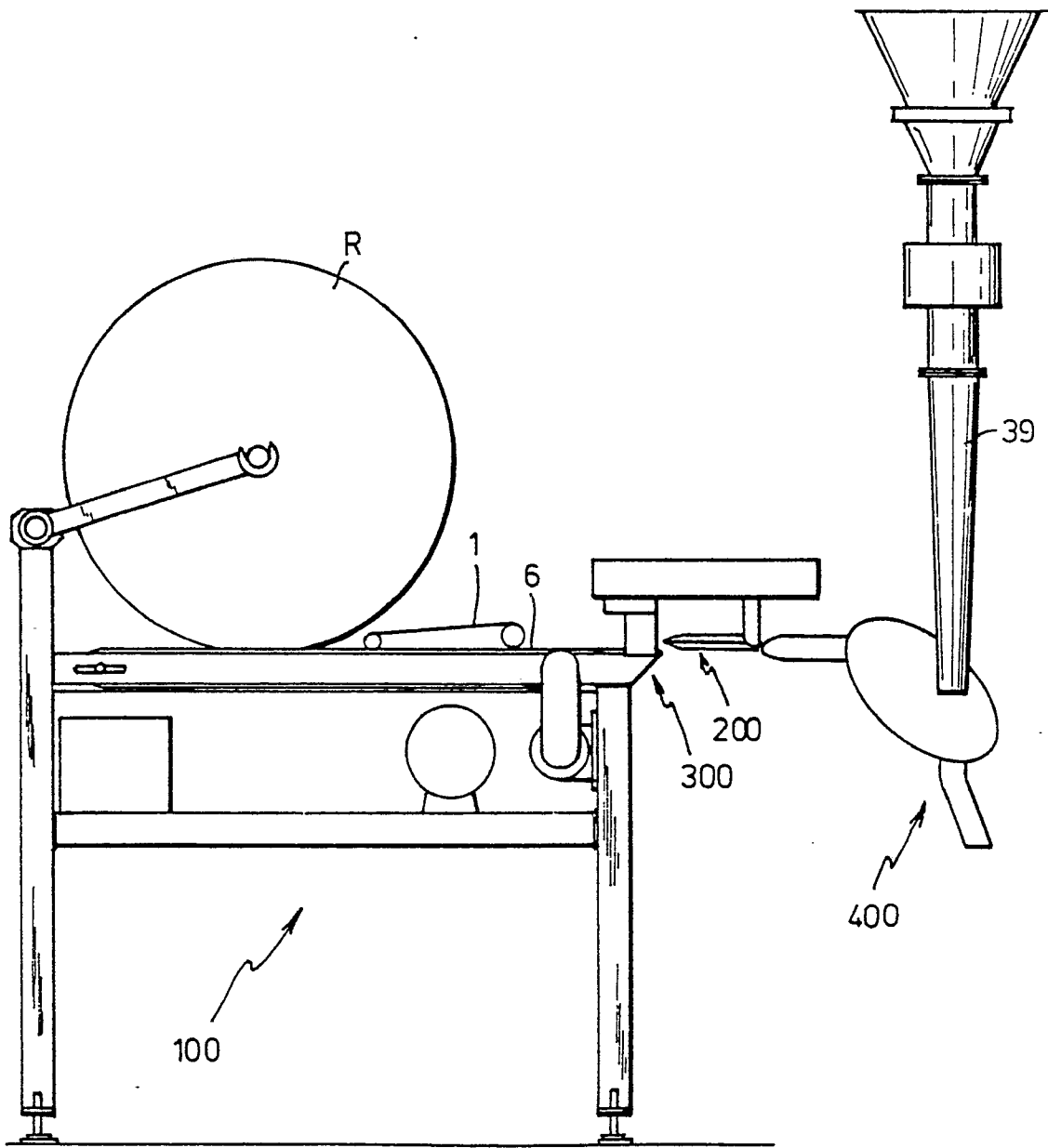


FIG. 1

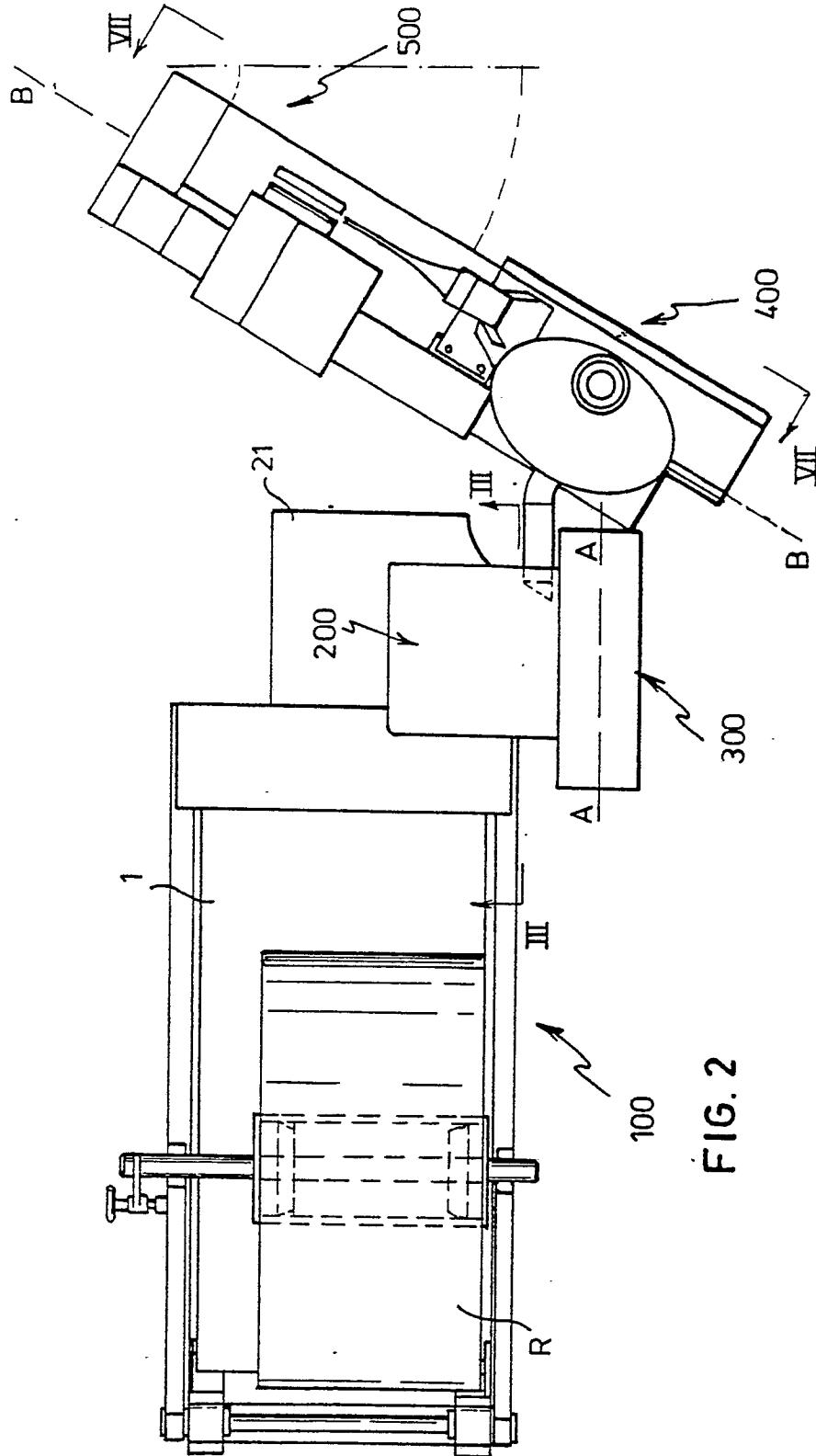


FIG. 2

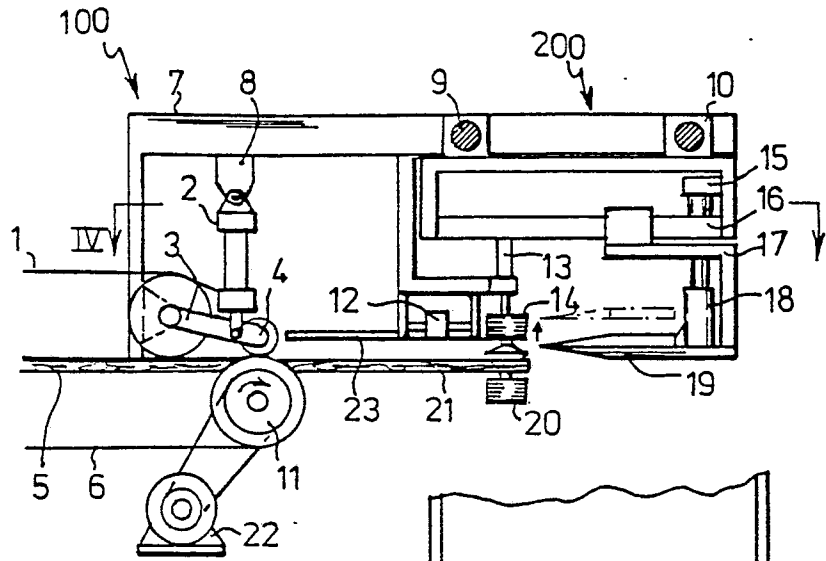


FIG. 3

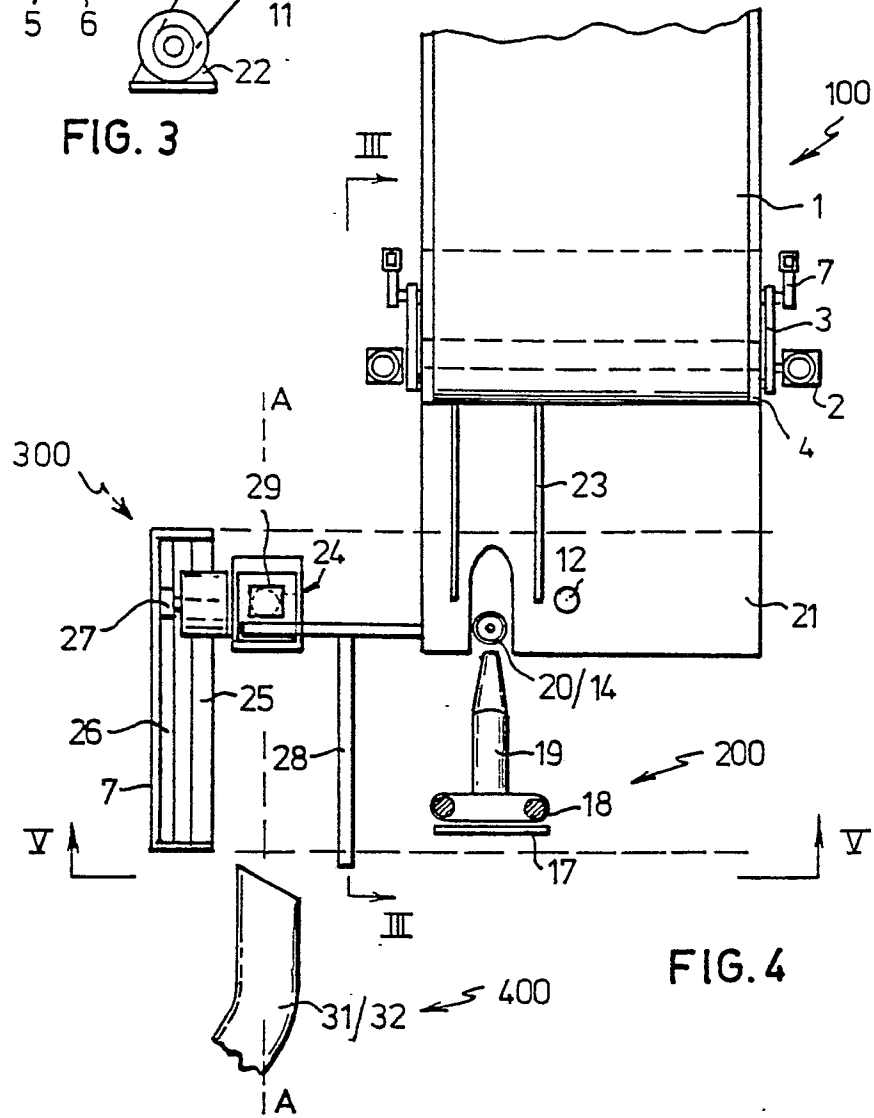
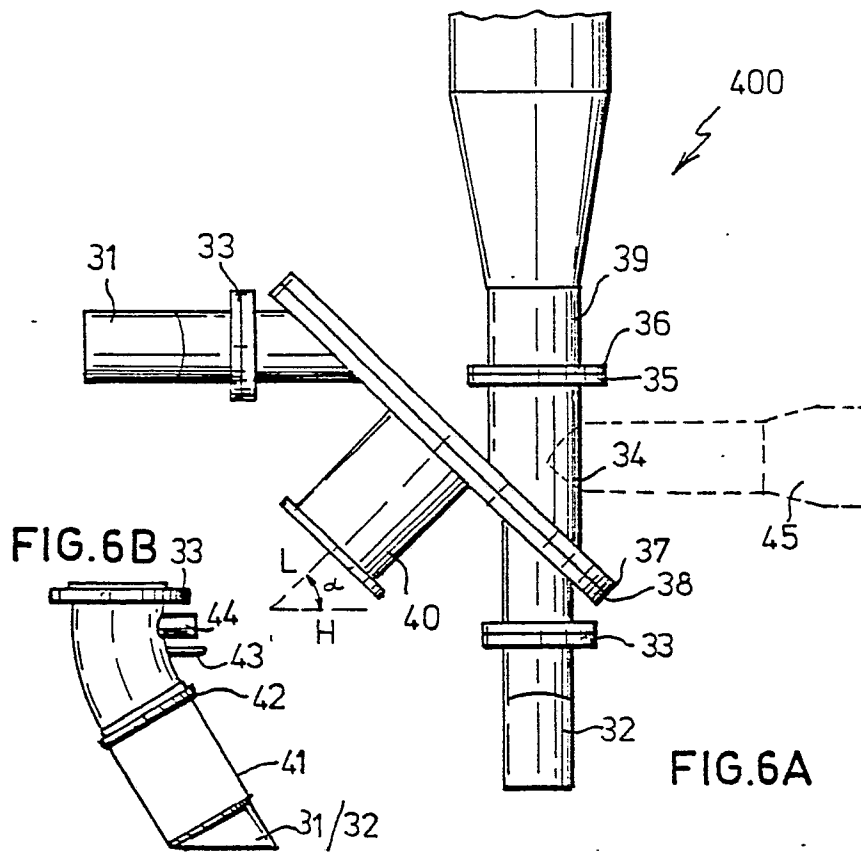
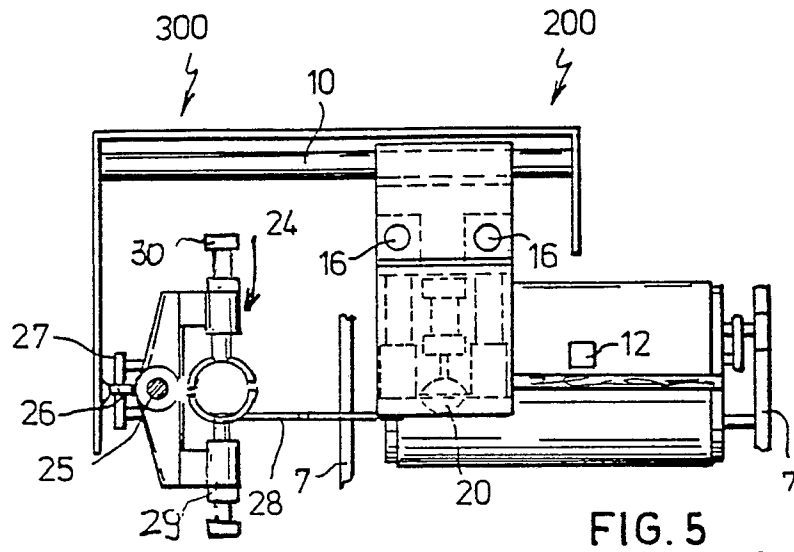


FIG. 4



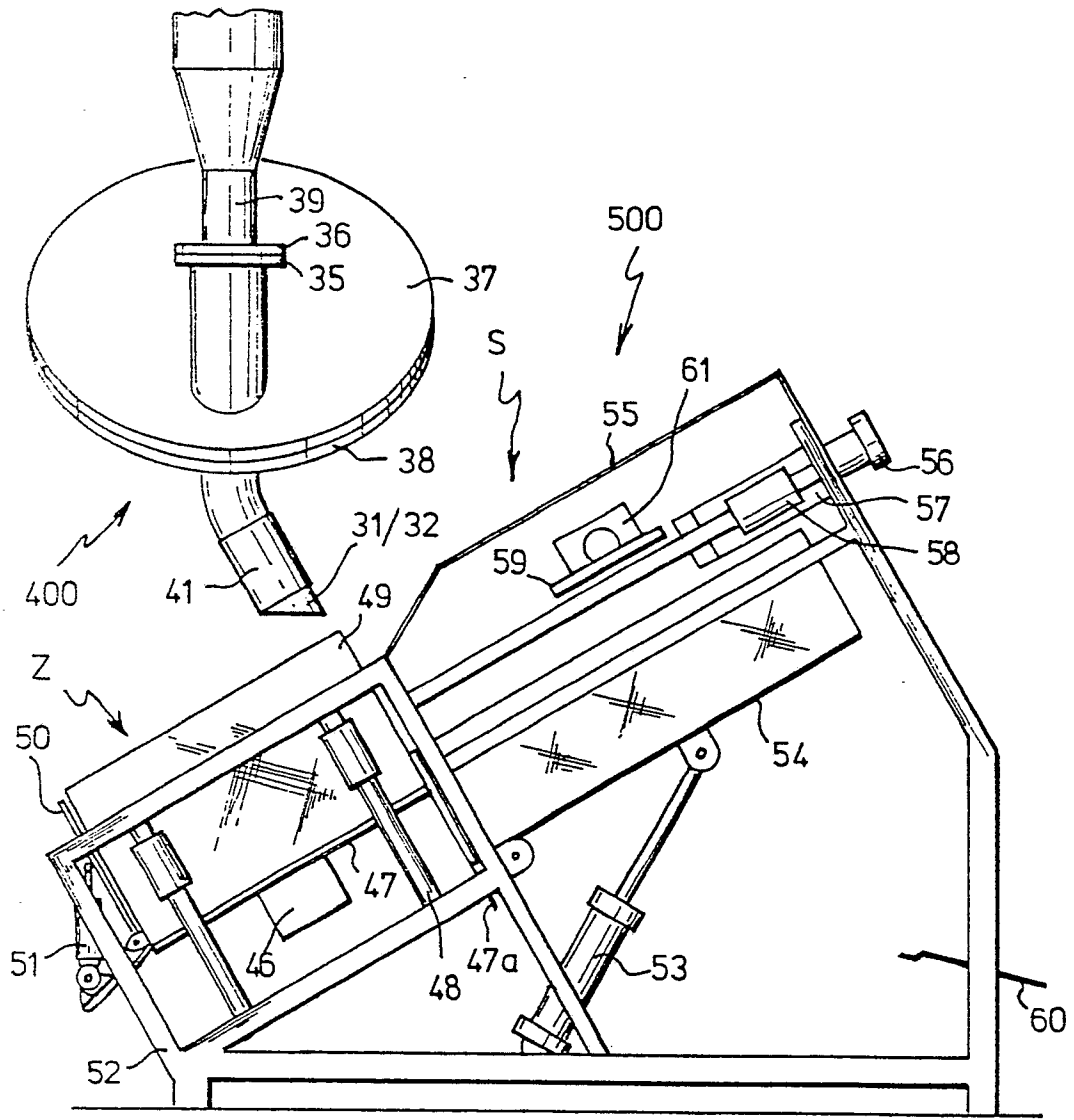


FIG. 7