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(54) **Double-headed device for wrapping fruit applicable to packaging machines**

Doppelvorrichtung für Verpackungsmaschinen zum Verpacken von Obst

Dispositif double pour emballer des fruits, utilisable dans des machines d'emballage

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(74) Representative: **Duran Moya, Carlos et al**
DURAN-CORRETJER
Còrsega, 329
(Paseo de Gracia/Diagonal)
08037 Barcelona (ES)

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(73) Proprietor: **Roda Packing, S.A.**
46600 Alzira (Valencia) (ES)

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(72) Inventor: **Perez Galán**
46600 Alzira (Valencia) (ES)

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Description

[0001] The present invention relates to a device intended for wrapping fruit, having as one of its essential characteristics a double head, which makes it possible to achieve much greater utilization of the operating time of the wrapping machine.

[0002] Various machines are known at present for wrapping fruit, in which machines an element of tubular shape is used, normally produced from plastics mesh material of limited length, usually a multiple of the individual length of the bags which are used for wrapping, and which are formed by pinching, transverse welding and cutting of the tubular mesh element in the regions corresponding to the ends of each of the bags in which filling has taken place.

[0003] The machines of known type have different systems for feeding the tubular mesh element to the bag closure region, which is customarily constituted in the lower part of a metal tube on which is inserted the tubular mesh element mentioned above. The feed assemblies have rollers which make contact on the tubular mesh element situated on the cylindrical body, causing it to advance by the amount required to produce the different bags in succession.

[0004] One of the drawbacks of the machines known at present lies in the discontinuity of the production cycle, owing to the need to replace the tubular mesh element on the cylindrical body for guiding the latter, once the mesh element previously used has completely run out. This makes it necessary to stop the machine momentarily for the insertion of a new tubular mesh element so that work can recommence.

[0005] GB 2087338 discloses an apparatus intended for packing sausages or cheese. This apparatus is a double-headed wrapping device comprising a carrier disc as a common support for two parallel hollow mandrels. These mandrels are used for feeding tubular film onto the article to be wrapped. In one preparatory position, one mandrel may be stocked with a new film, whereas in the second position the mandrel serves for filling the tubular film with products. The axis of rotation of the common support for the mandrels is preferably horizontal. The apparatus of GB 2087338 is disadvantageous, in particular with respect to the operating time during the wrapping process.

[0006] In order to remedy the drawbacks mentioned, the present invention provides a double-headed device as described in claim 1, so that each of the said heads or units has a tubular body intended to occupy two positions in succession, one of which is a working position in which it will receive on the outside the tubular mesh element which will be withdrawn successively by the rollers for the filling and separation of the individual bags, and the other a position in which the said tubular element is separated towards the outside of the machine, allowing the placing in position of a new tubular mesh element which will be used at the appropriate mo-

ment when the one which is being used has run out. All that is required for the said change is the rotation, through a predetermined angle, of a frame assembly for supporting both tubular elements, so that the loss of useful working time on the machine is insignificant.

[0007] In order to achieve its objectives, the device which is the subject of the present invention has a single plate or frame which carries the two tubular bodies for guiding the tubular mesh element, including an independent motor unit intended to effect the rotation of the carrier plate through a predetermined angle, which may be 180°, in order to permit the change. Each of the cylindrical elements for supporting and guiding the tubular mesh element has an assembly of drive rollers located on the upper or lower part of the cylinder, including the corresponding gear trains for driving from a main motor, and the said rollers being mounted on rocker arms or linear systems actuated by cylinder and piston assemblies of the hydraulic or pneumatic type, which are independent of one another, in order to allow the said rollers to tilt or move linearly between an operating position, in contact against the mesh element arranged on the cylindrical guide element, and an open position, directed towards the outside, in which the said rollers cease to make contact with the mesh element so that the latter can be introduced, corresponding to the position for the exchange of the said tubular mesh element. The said rollers may also be separated for other operational purposes.

[0008] The device has a single filling station integrated with the corresponding entry hopper for the pieces of fruit and also the corresponding closure and transverse cutting mechanisms.

[0009] For greater understanding there are attached, by way of example, explanatory drawings of preferred embodiments of the device which is the subject of the present invention.

[0010] Figures 1 to 7 represent various diagrammatic views of arrangements of feed rollers of the type known at present.

[0011] Figure 8 is a diagrammatic plan view of the carrier plate for the two stations or heads of the device.

[0012] Figure 9 is a diagrammatic view in which can be seen the relative position of the tubular element and the rollers for withdrawal of the latter.

[0013] Figures 10 and 11 are simplified views which show different operating positions of the apparatus.

[0014] Figure 12 is a diagrammatic view of a variant with the rollers located in the lower part.

[0015] Figure 13 is a view in side elevation of one of the units of the device, a detail thereof being shown in Figure 14.

[0016] Figure 15 is a plan view of the device, in which the arrangement of the two heads is shown diagrammatically.

[0017] Figure 16 is a view in elevation corresponding to Figure 15.

[0018] Figures 17 and 18 are respectively views in

side and front elevation of the device in the variant of application of the rollers in the lower part.

[0019] As can be seen in the Figures, there are many variants of drive rollers in the machines known at present, as shown in Figures 1 to 7. In Figure 1 the rollers 1 and 2 are shown at a tangent to the surface of the tubular element 3 which carries the cylindrical mesh element. Figure 2 shows rollers of substantially "diabolo" or frustoconical longitudinal shape which are indicated by the numbers 4 and 5, which make contact with discrete regions of the central cylindrical body 6. A variant of this arrangement can be seen in Figures 3 and 4, in which there can be observed the arrangement of different pairs of rollers 7, 7' and 8, 8' on different shafts 9 and 10, in order to act on the central cylindrical body 11, and in the case of Figure 4, the pairs of rollers 12, 12' and 13, 13', which act on the central cylindrical body 14, being driven by single shafts such as 15 and 16 by way of bevel gears or another similar arrangement.

[0020] In the case of Figure 5, the rollers 17 and 18 act on a covering 19 of the tubular element, which causes marked concave regions of pinching of the tubular mesh element. In Figure 6, which corresponds to a plan view of Figure 5, there can be observed the arrangement of the rollers with respect to the covering of the tubular element. The variant in Figure 7 shows two rollers 22 and 23 of a resilient material which, by means of a pressure P, forms a concave profile, which rollers adapt to the periphery of the cylindrical body 24 in order to effect the withdrawal of the tubular mesh element.

[0021] As is shown very diagrammatically in Figure 8, the device which is the subject of the present invention has two units 25 and 26, each of which carries a tubular body to receive a fragment or section of the mesh element, and the respective drive rollers, the two units being incorporated in the same rotary frame or plate 27 driven, in a form which is not shown in detail, by a motor 28.

[0022] According to an arrangement provided for in the present invention, each of the cylindrical elements will receive on the outside the tubular mesh element 29, Figure 9, which will be fed in an upward direction by means of the rollers 30 and 31 which will occupy the active position shown in the said Figure 9 in which they are at a tangent to the tubular mesh element 29 in order to feed it to the upper part of the rigid tubular guide body, and another position shown by means of the numbers 30' and 31', in which the said rollers are separated from the working position, allowing the placing in position of a new mesh element or permitting any other manipulation to be carried out.

[0023] In Figure 10 can be observed the arrangement of the two tubular bodies 32 and 33, one of which is shown in a working position in which the upper rollers 34 feed the mesh to the upper part of the tube 32, in order to receive the pieces of fruit from the single hopper 35, while the other position shows the arrangement of the outer tubular mesh element 36 prepared for subse-

quent use. The bags are subject to closure at both ends 37 and 38, each closure being complemented by a conventional cutting operation.

[0024] In the case of Figure 12, a variant is shown in which the plate 39 which carries the two units of the machine is arranged in the upper part with the tubular bodies arranged towards the bottom and the feed rollers 40 and 41 likewise arranged in the lower part. Figure 11 shows the two corresponding tubular bodies 42 and 43, as well as the single upper hopper 44.

[0025] As can be seen in Figure 13, the plate or frame which carries the two heads is driven by means of a motor 45 with a transmission, not shown in detail, for driving the plate through a predetermined angle, usually 180°, necessary for the changing of the working unit. The upper rollers are driven by means of a motor 46 which, by means of a gear-wheel 47, transmits its drive to the intermediate gears 48 and 49 corresponding respectively to one or other of the two units of the double machine which in turn transmit their rotation by means of the gearwheels 50 and 51 and the corresponding belts or chains 52 and 53 to the upper rollers 54 and 55 intended to feed the tubular mesh element to the upper mouth of the rigid tubular body 56.

[0026] The rollers 54 and 55 are mounted on individual rocker arms, not shown in detail, in order to allow them to assume the positions shown previously in Figure 9, for which purpose cylinder and piston devices 57 and 58 are provided, preferably hydraulic, which make it possible to tilt the said rollers from the working positions to the positions intended for filling and other manipulations. Another, upper, cylinder and piston assembly 59 makes it possible to tilt the plate 60 which carries the transmission elements associated with the main motor.

[0027] Figures 17 and 18 show a version in which the single motor 61, by means of the wheel 62, drives the gears 63 and 64 which transmit their motion to the rollers 65 and 66, arranged on the lower part of the rigid cylindrical body 67. The cylinder and piston elements equivalent to those described previously are shown by the numbers 68, 69 and 70.

[0028] With the means which have been described, a highly efficient machine for the wrapping of fruit is obtained, which will make it possible to carry out the said wrapping with the maximum utilization of the industrial equipment, and at the same time will achieve gentle handling of the pieces of fruit, avoiding damage thereto.

Claims

1. Double-headed device for wrapping fruit, comprising an assembly which carries two rigid tubular bodies (32, 33, 56) receiving tubular mesh elements (29) on their periphery, being incorporated in a single frame rotatable about a vertical axis at a predetermined angle and in a predetermined direction,

there being associated with each tubular assembly, depending on the case, one or two pairs of drive rollers (30, 31, 54, 55, 65, 66) for the displacement of the coupled mesh element (29) on the outside of the tubular body (32, 33, 56), whereby the pairs of drive rollers (30, 31, 54, 55, 65, 66) are mounted on individual rocker arms actuated by cylinder and piston assemblies (57, 58) driven by a pressurized fluid between two predetermined positions, one of which, the working position, is at a tangent to the rigid tubular body (32, 33, 56), and the other is a position of separation with respect to the said tubular element, in order to permit the placing in position of the mesh and other manipulations, whereby the pair of feed rollers (30, 31, 54, 55, 65, 66) associated with each rigid tubular working body (32, 33, 56) of the machine is driven by means of a single motor (46, 61) transmitting its drive force, through a single gearing arrangement (47), to the drive gears (50, 51) of the roller systems of each of the rigid tubular working bodies (32, 33, 56) of the machine whereby an upper cylinder and piston assembly (59) is arranged adjacent to the main drive motor (46) for the feed rollers (30, 31, 54, 55, 65, 66), capable of effecting the tilting or linear displacement of the drive train.

2. Double-headed device for wrapping fruit, according to the preceding claim which is **characterized in that** it effects the withdrawal of the flexible mesh (29) either from the lower part of the tube (32, 33, 56) containing it or from the upper part, practically continuously by means of one or two pairs of rollers (30, 31, 54, 55, 65, 66).

Patentansprüche

1. Doppelköpfige Vorrichtung zum Verpacken von Obst, umfassend eine Anordnung, die zwei starre rohrförmige Körper (32, 33, 56) trägt, welche schlauchförmige Netzelemente (29) an ihrem Umfang aufnehmen, aufgenommen in einem einzigen um eine vertikale Achse in einem vorbestimmten Winkel und in einer vorbestimmten Richtung drehbaren Gestell, wobei zu jeder rohrförmigen Anordnung - je nach Fall - ein oder zwei Paare Antriebsrollen (30, 31, 54, 55, 65, 66) zur Verschiebung des angesetzten Netzelements (29) auf der Außenseite des rohrförmigen Körpers (32, 33, 56) vorgesehen sind, wobei die Paare von Antriebsrollen (30, 31, 54, 55, 65, 66) an individuellen Schwenkarmen gelagert sind, die von Kolben-Zylindern-Anordnungen (57, 58) betätigt werden, welche von einem Druckfluid zwischen zwei vorbestimmten Stellungen angetrieben werden, von denen die eine als Arbeitsstellung eine Tangente bezüglich des starren rohrförmigen Körpers (32, 33, 56) bildet, und die andere

eine von dem rohrförmigen Element abgerückte Stellung ist, damit das Netz in seine Stellung gebracht werden kann und andere Manipulationen vorgenommen werden können, das Paar von Transportrollen (30, 31, 54, 55, 65, 66), welches zu jedem starren rohrförmigen Arbeitskörper (32, 33, 56) der Maschine gehört, mit Hilfe eines einzelnen Motors (46, 61) angetrieben wird, der seine Antriebskraft über eine einzelne Getriebeanordnung (47) auf die Antriebszahnräder (50, 51) der Rollensysteme für jeden der starren rohrförmigen Arbeitskörper (32, 33, 56) der Maschine überträgt, und eine obere Kolben-Zylinder-Anordnung (59) benachbart zu dem Hauptantriebsmotor (46) für die Transportrollen (30, 31, 54, 55, 65, 66) angeordnet ist, um die Antriebsanordnung kippen oder linear versetzen zu können.

2. Vorrichtung zum Verpacken von Obst nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die das Abziehen des flexiblen Netzes (29) entweder von dem unteren Teil des das Netz aufnehmenden Rohrs (32, 33, 56) oder von dem oberen Teil im wesentlichen kontinuierlich mit Hilfe eines oder zweier Rollenpaare (30, 31, 54, 55, 65, 66) vornimmt.

Revendications

1. Dispositif double pour emballer des fruits, comprenant un ensemble qui supporte deux corps tubulaires rigides (32,33,56) recevant des éléments de maille tubulaire (29) sur leur périphérie, incorporés dans un châssis unique pouvant tourner autour d'un axe vertical selon un angle prédéterminé et dans une direction prédéterminée, associé avec chaque ensemble tubulaire, selon le cas, une ou deux paires de rouleaux d'entraînement (30,31,54,55,65,66) pour le déplacement de l'élément de maille accouplé (29) sur l'extérieur du corps tubulaire (32,33,56), dans lequel les paires de rouleaux de commande (30,31,54,55,65,66) sont montés sur des bras basculants individuels actionnés par des ensemble à piston et à vérin (57,58) entraînés par un fluide sous pression entre deux positions prédéterminées dont l'une, la position de travail est tangentielle au corps tubulaire rigide (32,33,50), et l'autre est une position de séparation par rapport audit élément tubulaire pour permettre la mise en place de la maille et d'autres manipulations, dans lequel la paire de rouleaux d'alimentation (30,31,54,55,65,66) associée à chaque corps de travail tubulaire rigide (32,33,56) de la machine est entraînée au moyen d'un moteur unique (46,61) transmettant sa force d'entraînement par l'intermédiaire d'un système réducteur simple (47), aux en-

grenages d'entraînement (50,51) des systèmes à rouleaux de chacun des corps de travail tubulaires rigides (32,33,56) de la machine, dans lequel un ensemble de piston et vérin supérieur (59), contigu au moteur d'alimentation principal (46) des rouleaux d'alimentation (30,31,54,55,65,66), peut effectuer le basculement ou le déplacement linéaire du train d'entraînement.

2. Dispositif double pour emballer des fruits selon la revendication précédente, **caractérisé en ce qu'il** effectue le prélèvement de la maille flexible (29) soit à partir de la partie inférieure du tube (32,33,56) la contenant soit à partir de la partie supérieure, de façon pratiquement continue au moyen d'une ou de deux paires de rouleaux (30,31,54,55,65,66).

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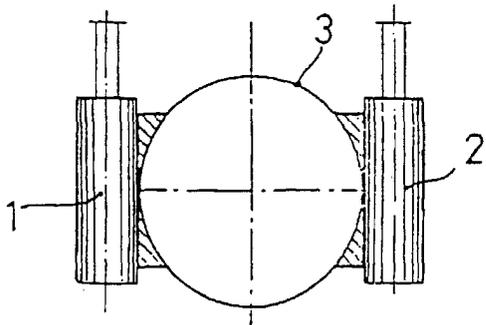


FIG. 1

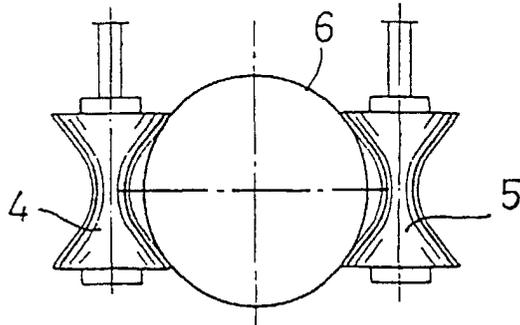


FIG. 2

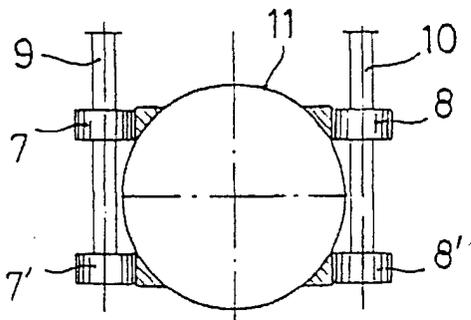


FIG. 3

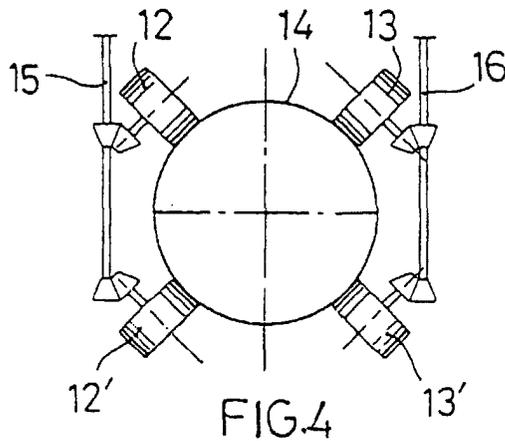


FIG. 4

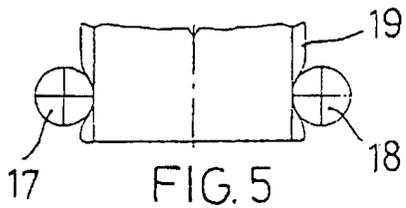


FIG. 5

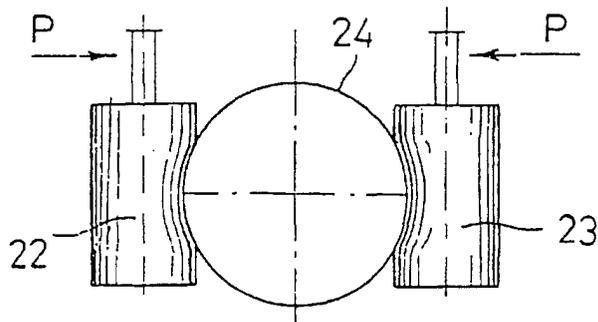


FIG. 7

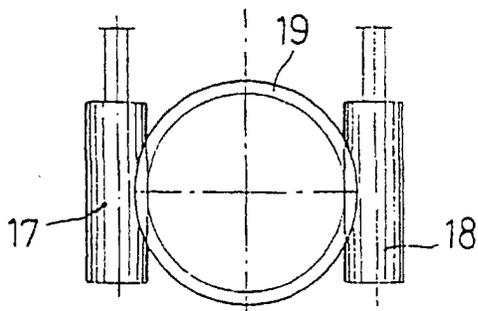


FIG. 6

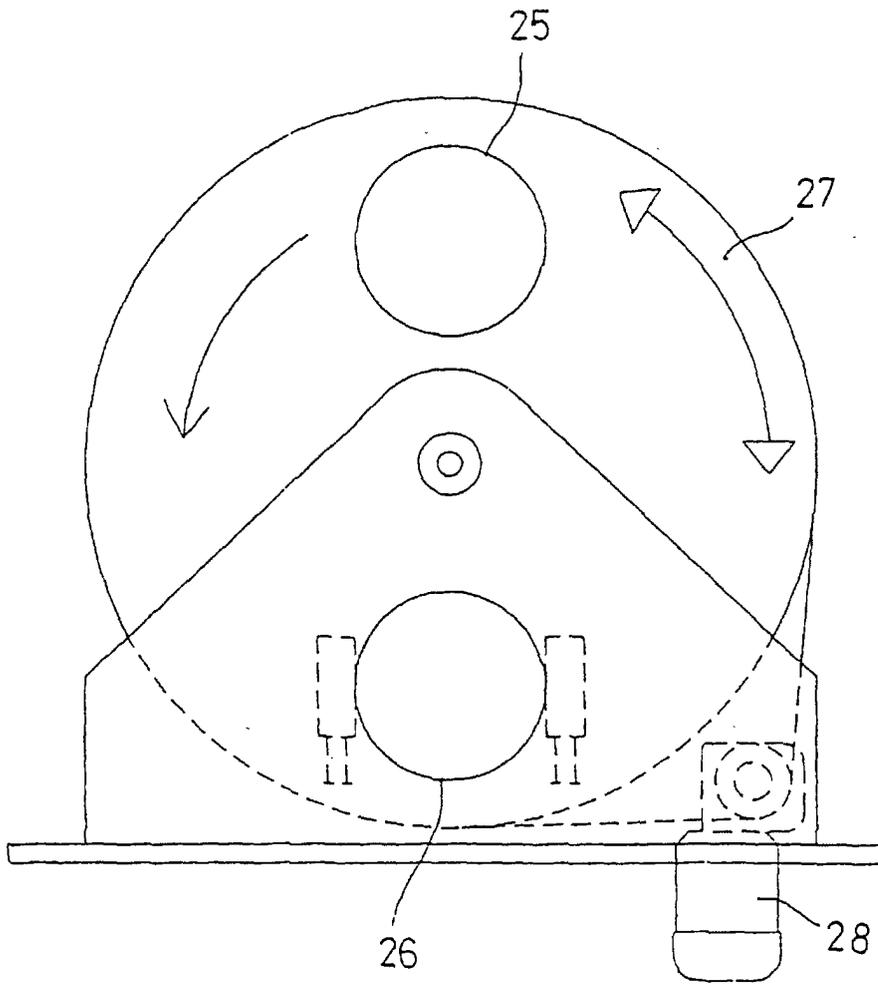


FIG. 8

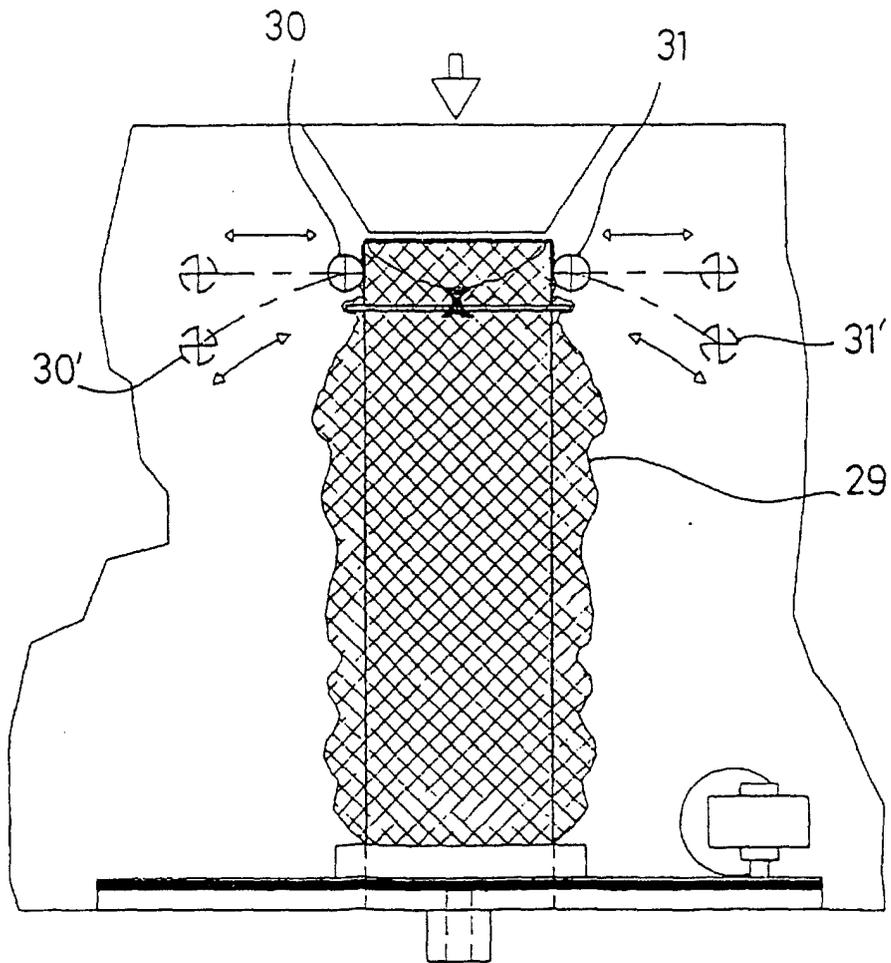


FIG. 9

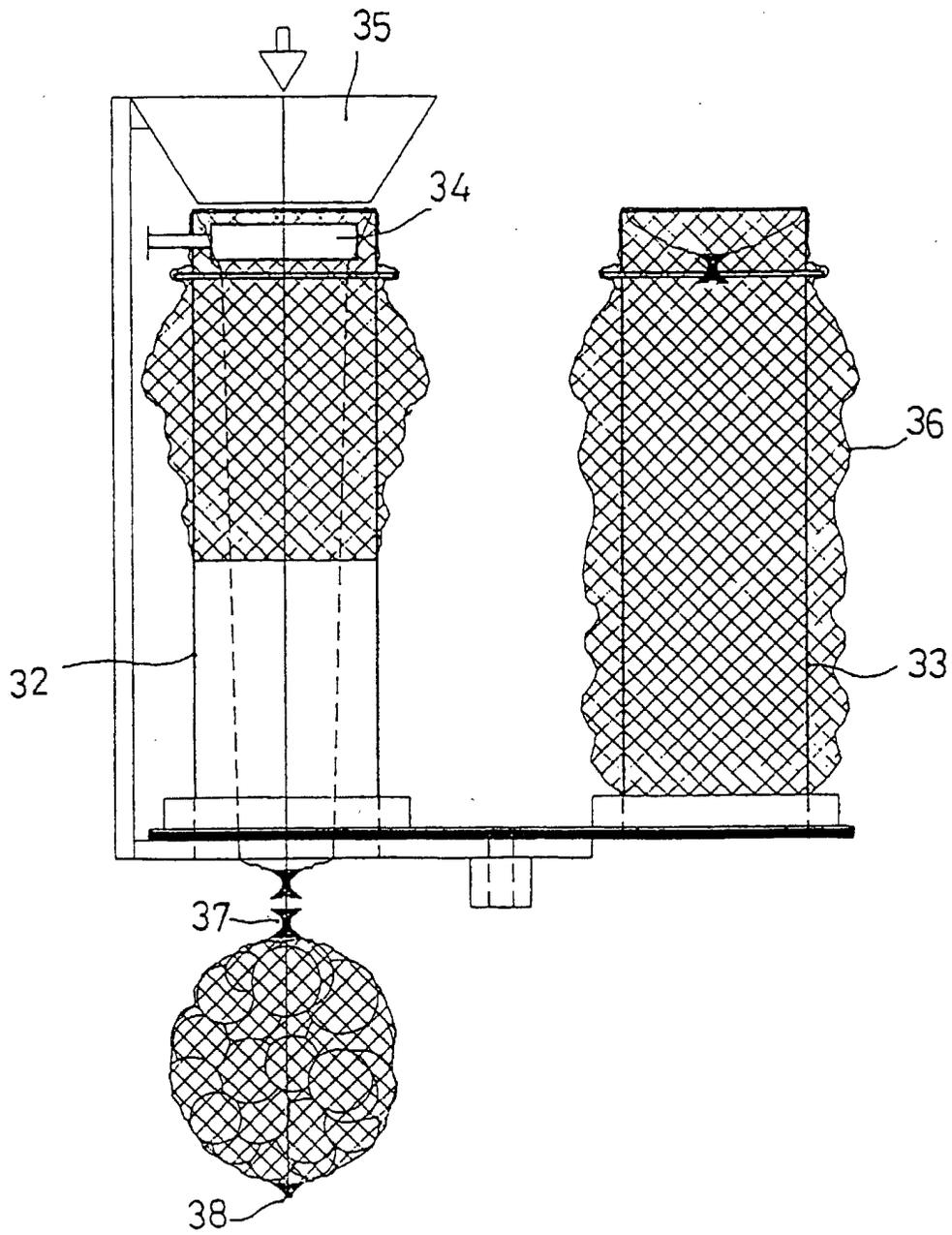


FIG.10

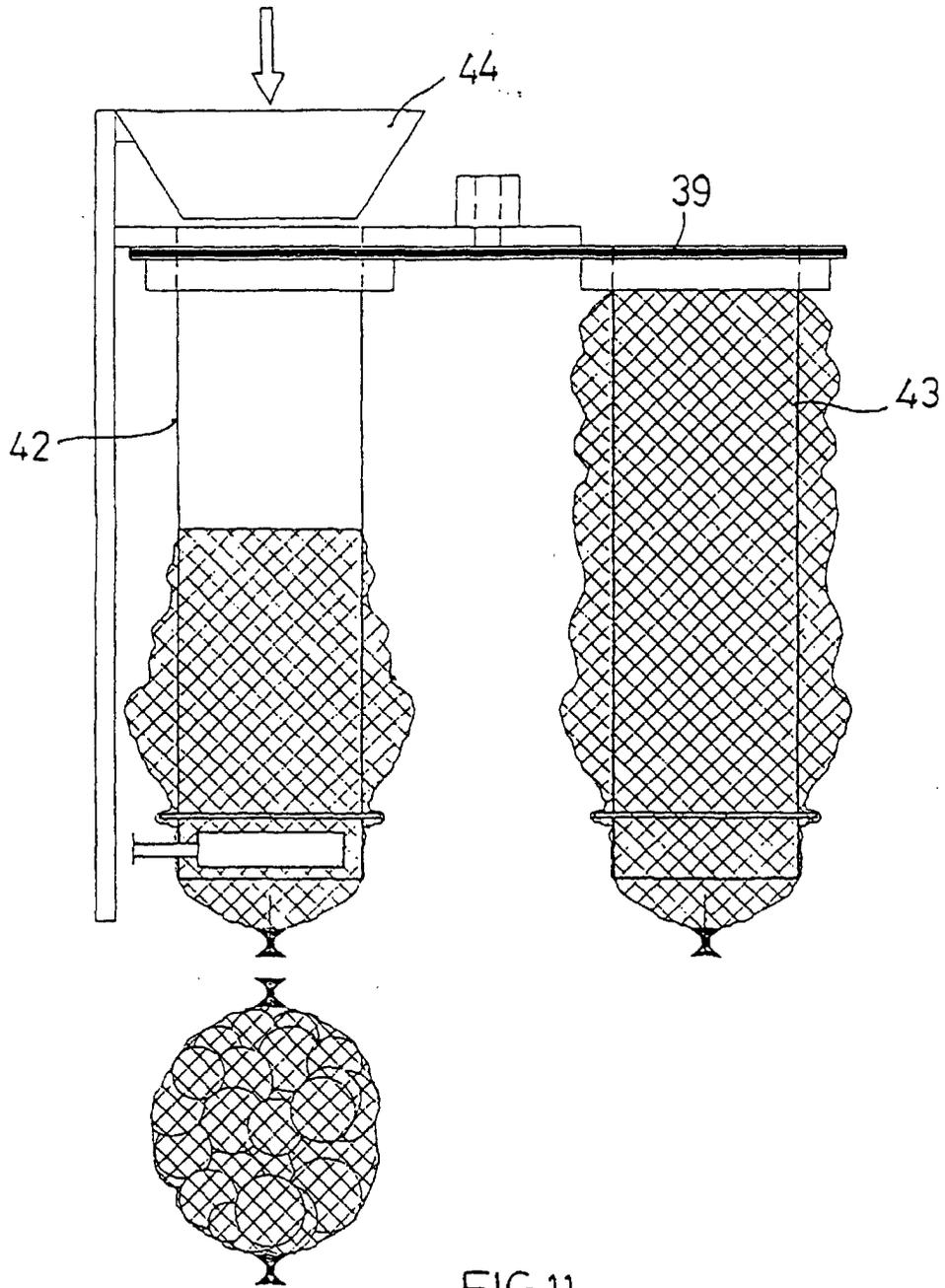


FIG.11

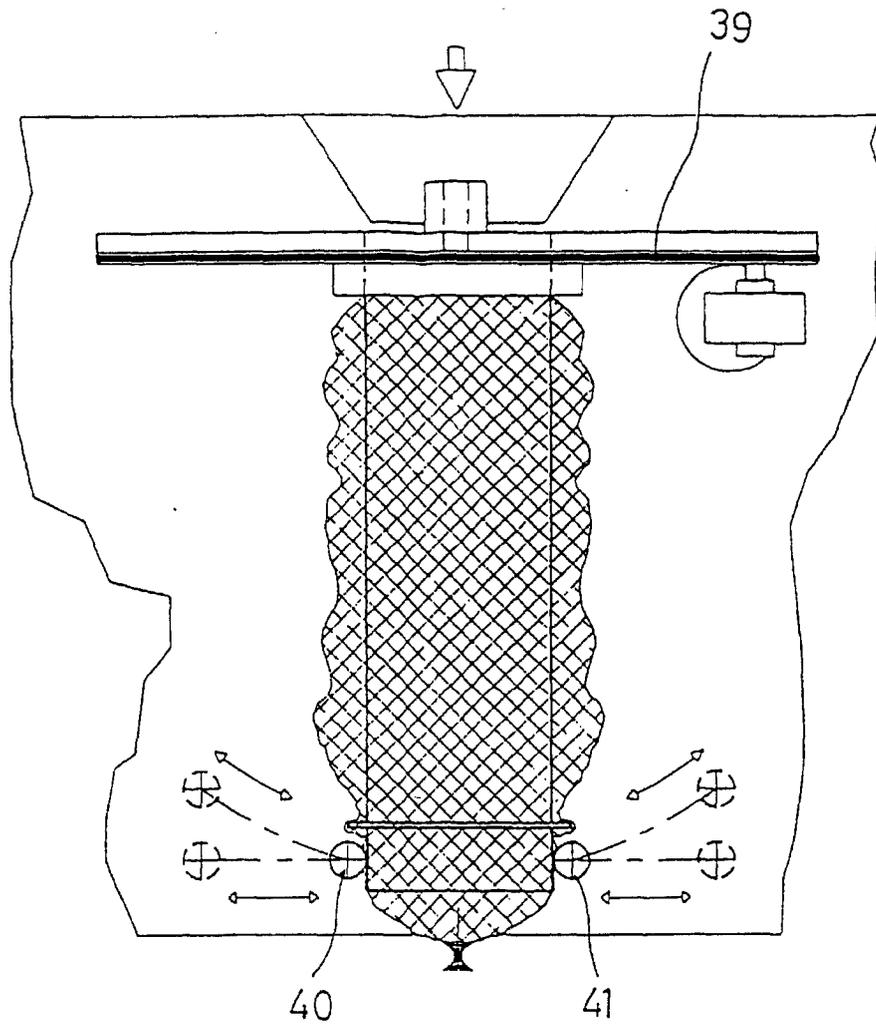
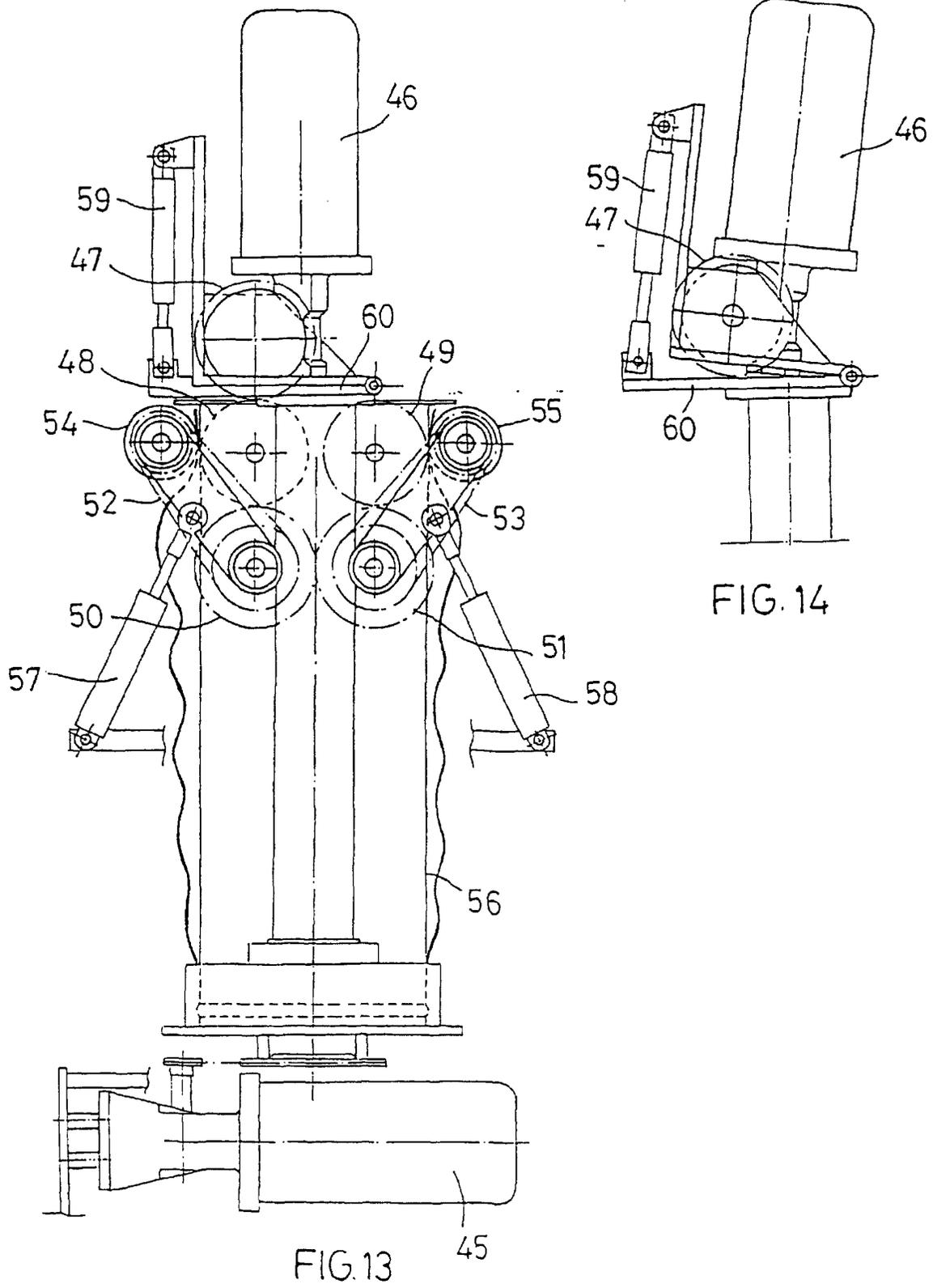


FIG.12



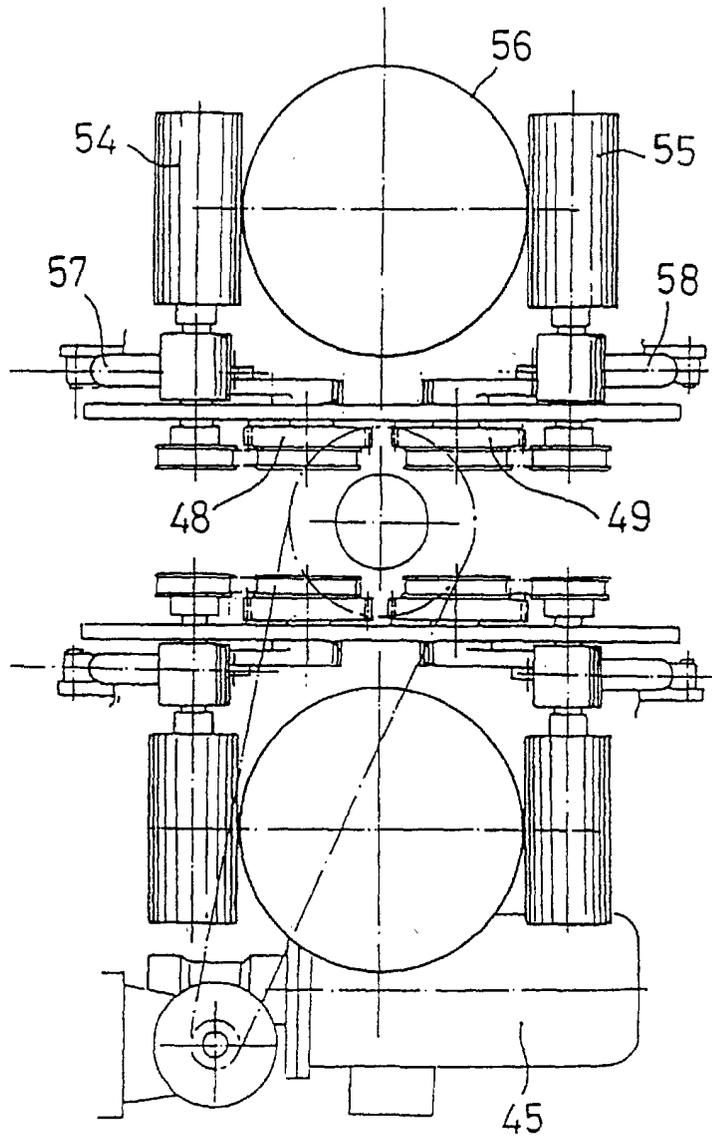


FIG. 15

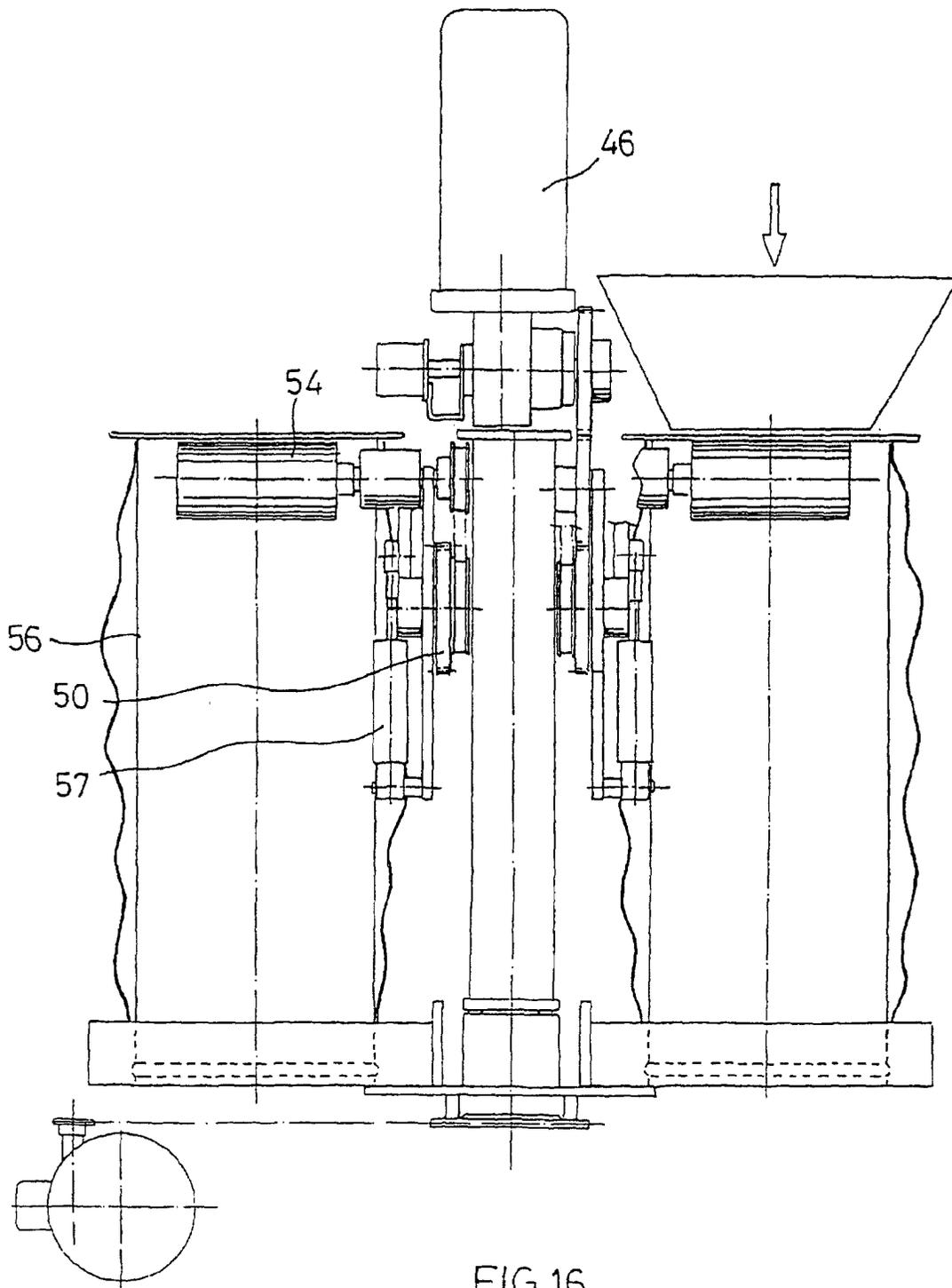


FIG. 16

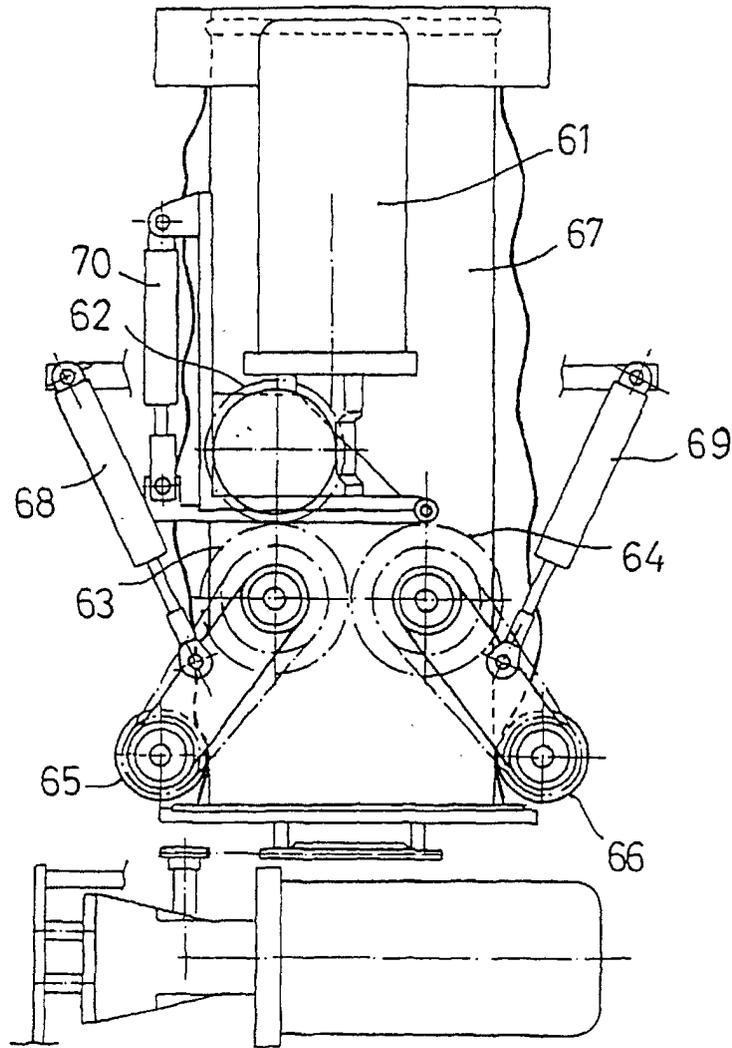


FIG. 17

