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(54) **Extraction mechanism for automatic vending machines of packed products**

Herausziehmechanismus für Verkaufsautomaten für abgepackte Produkte

Mécanisme d'extraction pour distributeurs automatiques de produits emballés

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Description

FIELD OF THE INVENTION

[0001] The present invention refers to an extraction mechanism for automatic vending machines of packed products, and more specifically a mechanism in charge of p lacing at the outlet of the machine the packages provided by said machine, after they have been selected by the user.

BACKGROUND OF THE INVENTION

[0002] Vending machines of packed products, especially those in packages, such as automatic tobacco vending machines, comprise a storing compartment in which the packages are arranged in channels or columns from which they fall, when they are selected by the users, to a receiving hopper leading to a collecting tray which extends along the entire length of the machine and which is accessible through an opening which goes through the front wall of said machine in horizontal direction. The fall of the package can occur randomly at any point of the tray, along it; that is why the opening of the tray must extend along the entire width of the front wall, a fact that reduces the resistance of this wall and prevents it from having a continuous surface, thus preventing that the machine can have an attractive aspect.

[0003] EP-A-O 229 264 describes a vending machine for packed products having an extraction mechanism which comprises a hopper to which the packages fall with the products selected by the user.

DESCRIPTION OF THE INVENTION

[0004] The object of the present invention is an extraction mechanism for automatic vending machines of the kind exposed which enables to reduce the size of the opening to access the product provided to dimensions which are enough to enable to access and extract the package, and this is possible because the mechanism of the invention secures the discharge of the package in a specific point, in which an access mouth to said package is formed.

[0005] In this way, the opening of the front wall to access the product is considerably reduced in its dimensions, with respect to traditional machines, while the resistance of the front wall is practically not reduced.

[0006] The circumstance indicated also enables to have a continuous front surface of the machines, closed almost completely, thus being possible to offer more attractive designs, since the access opening which traditionally extends along the entire front wall of the machine is eliminated.

[0007] The mechanism of the invention can be applied to vending machines of the previously indicated type, comprising a storing compartment in which the packages are arranged in channels or columns from which, after the users makes a selection, the package falls into a receiving hopper extending under all the channels or columns.

[0008] The mechanism of the invention comprises a channel into which the hopper leads, on whose bottom the selected package will fall each time, at any point along it. The width of the channel will be bigger than the length of the base of the packages but smaller than their height, so that said packages can fall on the bottom of the channel in vertical or horizontal position, longitudinally.

[0009] In the aforementioned channel, through one of its longitudinal walls, two push-rods penetrate, being said push-rods apart from each other longitudinally and located at different height. These push-rods can move along the channel in one direction, by means of a dragging mechanism arranged outside the channel, through which the push-rods move along the channel, going out through one of its cross-sections to penetrate, in a new operation, through the transverse wall opposite the channel. The channel leads transversely into the outlet side of the push-rods to a receiving surface or box, in which the package will be deposited and it will be accessible through a small mouth on the front wall of the machine.

[0010] The aforementioned dragging mechanism includes two continuous belts which are mounted, at different height, on a series of vertical axis rollers. One of these rollers is a driving roller, while the others are free-turning rollers, so that they serve as support means for the continuous belts. The two belts forming the dragging mechanism define two parallel circuits which include sections which move parallel to each other and next to the wall through which the push-rods penetrate, at different height, each continuous belt having a push-rod.

[0011] The push-rods can consist of straight fingers which penetrate perpendicularly in the channel, for example through parallel grooves located at different height in one of the longitudinal walls of the channel.

[0012] The driving and free-turning rollers are mounted between two flat and parallel chassis. The continuous belts can be chains which engage with cogged wheels integral to the driving and free-turning rollers.

[0013] The channel into which the hopper leads can include a first straight section, on which the packages coming from the hopper will fall, and a second curve section whose free transverse part will constitute the outlet of the channel, which will lead into the receiving box.

[0014] The channel will preferably have in its outlet a gate, whose opening occurs when the package pushes against it while being dragged by the push-rods, being said gate pushed to the closing position by a spring. This gate will prevent the hand of any user from entering the inside of the machine and will also serve as a means to stop the abrupt discharge of the package, which is dragged by the push-rods.

[0015] The mechanism of the invention will also have a detector of the passage of one of the push-rods, for example the lower push-rod, which will detect the passage thereof once the complete circuit of said push-rod

has finished, to send a stop order to the extraction mechanism.

[0016] The activation of the mechanism will take place from the sensor detecting the discharge of the package from the channel selected by the user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The attached drawings show a non-limiting example of an embodiment, and the description of said drawings will help understand better the constitution and characteristics of the extraction mechanism of the invention. In the drawings:

Figure 1 is a perspective view of the extraction mechanism constituted according to the invention.

Figure 2 is a lateral elevation view, according to the direction A of figure 1.

Figure 3 shows a plan view of the extraction mechanism of figures 1 and 2.

DETAILED DESCRIPTION OF AN EMBODIMENT

[0018] The mechanism shown in the drawings is intended for automatic vending machines of packed products, whose machines have a hopper 1 to receive the packages 2 which fall from the channels or columns defining the storing compartment of the products to be provided.

[0019] According to the invention, the hopper 1 leads downwardly into a channel 3, the width of which is bigger than the length of the base of the packages 2, but smaller than their height, so that the packages 2 can fall on the bottom of the channel, as indicated with reference 2' in figure 2, in vertical or horizontal position.

[0020] Through one of the longitudinal walls 4 of the channel 3, two push-rods can penetrate, said push-rods comprising many rods or plates 5 and 6, at different height, which can move along the entire channel. The wall 4 can have two longitudinal grooves 7 and 8 located at different height, through which the push-rods 5 and 6 can penetrate.

[0021] For the push-rods 5 and 6 to move, they are part of an external dragging mechanism, which is constituted by two parallel continuous belts 9 and 10, located at different height, mounted on vertical axis rollers, one of which -indicated by reference 11- is a driving roller, while the others are free-turning rollers, indicated by reference number 12.

[0022] To secure the position of the continuous belts 9 and 10, as well as their movement, said continuous belts can be chains which engage with upper cogwheels 13 and lower cogwheels 14, integral to the corresponding rollers, being two of these cogwheels - indicated by numbers 13' and 14'- devised as cogged wheels with a bigger diameter.

[0023] As indicated before, the roller 11 is a driving roller, and so are the cogwheels 13 and 14 integral thereto. To that end, the roller 11 is related to a driving motor 15, figure 2.

[0024] The vertical axis rollers 11 and 12 are mounted between two flat chassis, a lower one 16 which can consist of a continuous plate, and an upper one 17 having the shape of a frame, where both chassis can have tighteners 18 between which the axis of one of the rollers 12 is mounted to tighten the continuous belts or chains 9 and 10.

[0025] Each one of the continuous belts 9 and 10 has one of the push-rods 5 and 6, which are longitudinally spaced out from one another, being the push-rod 5 fixed to the upper continuous belt located in front of the push-rod 6.

[0026] Between the cogwheels 13 and 14 of the roller 11 and the cogged wheels with a bigger diameter 13' and 14', the continuous belts 9 and 10 determine sections which move parallel to each other and next to the longitudinal wall 4 through which the push-rods 5 and 6 penetrate inside the channel 3, as shown with references 5' and 6' in figure 2.

[0027] As it can be better seen in figure 3, the channel 3 includes a straight section, indicated by number 3', into which the hopper 1 leads, and a curve section 3", leading into the outside through its free cross-section, which has a closing gate 21, which will be opened when a package 2' pushes against it while it is ejected to the outside by the back push-rod 6, located under the push-rod 5. The gate 21 will be constantly pushed towards the closing position by a spring 22.

[0028] The gate 21, in its closing position, will prevent any user from inserting his/her hand through the channel 3 and at the same time it will act as a stop means for the discharge of the packages 2', which can be pushed to the outside by the push-rod 6.

[0029] As it can be seen in the drawings, the mechanism of the invention also has a sensor 23 which detects the passage of one of the push-rods, in the example represented in the drawings of the push-rod 6 situated in its lower position, after it has completed the entire circuit, finishing a complete turn, to stop the mechanism. The activation of the extraction mechanism occurs thanks to the sensor which, in each case, detects the discharge of a package from a channel or column, to fall into the hopper 1.

[0030] With the arrangement described, a package 2 falling from the hopper 1 to the channel 3 can rest at the bottom thereof, along the straight section 3' of said channel, in horizontal or vertical position, as indicated by references 2' in figure 2. In the second case, the package 2' will receive first the action of the push-rod 5 located on top of it and in front of the push-rod 6. This push-rod 5 will act on the upper part of the package 2' located in vertical position, causing its free fall on the bottom of the channel. In this position it will receive the action of the lower and back push-rod 6, which will drag it to the outlet,

as indicated by reference 2' in figure 3.

[0031] The mechanism of the invention thus enables to place the packages falling through the hopper 3 in a fixed point, corresponding to the outlet, of the channel 3 and in a determined position.

[0032] In the outlet 20 of the channel 3 there will be a receiving box, with dimensions big enough to house the package 2', with a small mouth in the front wall of the machine, providing access to this box.

Claims

1. Extraction mechanism for automatic vending machines of packed products, comprising a hopper (1) to which the packages (2) fall with the products selected by the user, **characterized in that** said hopper (1) leads into a channel (3) in which two push-rods (5, 6) penetrate, through one of its longitudinal walls (4), being said push-rods (5, 6) apart from each other longitudinally and located at different height, said push-rods (5, 6) which go through the channel (3) and can move along it in one direction by means of an external dragging mechanism to which they are connected, the channel leading transversely into the outlet side of the push-rods (5, 6) on a receiving box.

2. Mechanism according to claim 1, **characterized in that** the dragging mechanism comprises two continuous belts (9, 10) which are mounted, at different height, on a series of vertical axis rollers, being one of these rollers a driving roller (11) and the others free-tuming rollers (12), defining two parallel circuits which include sections which move parallel to each other and next to the wall through which the push-rods (5, 6) penetrate, each continuous belt having a push-rod.

3. Mechanism according to claim 2, **characterized in that** the continuous belts (9, 10) are chains which engage with cogwheels (13, 14) integral to the vertical axis rollers.

4. Mechanism according to claims 1 and 2, **characterized in that** the channel (3) comprises a first straight section (3') and a second curve section (3"), through which it leads into a receiving box.

5. Mechanism according to the preceding claims, **characterized in that** the push-rods (5, 6) consist of fingers or straight rods which penetrate perpendicularly into the channel.

6. Mechanism according to claim 2, **characterized in that** the driving (11) and free-turning rollers (12) are mounted between two parallel flat chassis.

7. Mechanism according to claims 1 to 5, **characterized in that** the wall (4) of the channel (3) through which the push-rods (5, 6) penetrate has two longitudinal grooves (7, 8) located at the same height as the circuits defined by the continuous belts (9, 10), for the passage of said push-rods (5, 6).

8. Mechanism according to claims 1 and 4, **characterized in that** the channel has a gate (21) mounted on its outlet, which is opened when the package (2') pushes against it while being dragged by the push-rods (5, 6), being said gate pushed to the closing position by a spring (22).

9. Mechanism according to claim 1, **characterized in that** it comprises a detector of the passage of one of the push-rods, once it has moved along the complete circuit of said push-rod.

Patentansprüche

1. Entnahmemechanismus für Warenautomaten von verpackten Produkten, umfassend einen Trichter (1), in welchen die Verpackungen (2) fallen, wobei die Produkte von dem Benutzer gewählt werden, **dadurch gekennzeichnet, dass** der genannte Trichter (1) zu einem Kanal (3) führt, in welchen zwei Stoßstangen (5, 6), durch eine der longitudinalen Wände (4) desselben, hineinragen, wobei die genannten Stoßstangen (5, 6) longitudinal voneinander getrennt sind und sich auf verschiedener Höhe befinden, wobei die genannten Stoßstangen (5, 6) den Kanal (3) durchqueren und sich entlang desselben mittels eines äußeren Mitnahmemechanismus, mit welchem sie verbunden sind, in eine Richtung bewegen können, wobei der Kanal quer zur Ausgangsseite der Stoßstangen (5, 6) auf einem Sammelkasten führt.

2. Mechanismus nach Anspruch 1, **dadurch gekennzeichnet, dass** der Mitnahmemechanismus zwei endlose Bänder (9, 10) umfasst welche auf verschiedener Höhe auf einer Reihe von Rollen vertikaler Achse montiert sind, wobei eine dieser Rollen eine Antriebsrolle (11), ist und die anderen Rollen freidrehende Rollen (12) sind, wobei zwei parallele Kreisläufe definiert werden, welche Abschnitte enthalten, die sich parallel zueinander und neben der Wand bewegen, durch welche die Stoßstangen (5, 6) hineinragen, wobei jedes endlose Band eine Stoßstange aufweist.

3. Mechanismus nach Anspruch 2, **dadurch gekennzeichnet, dass** die endlose Bänder (9, 10) Ketten sind, welche mit Zahnrädern (13, 14), die mit den Rollen vertikaler Achse einstückig gebildet sind, eingreifen.

4. Mechanismus nach Anspruch 1 und 2, **dadurch gekennzeichnet, dass** der Kanal (3) einen ersten geraden Abschnitt (3') und einen zweiten gekrümmten Abschnitt (3") umfasst, durch welche er zum Sammelkasten führt.

5. Mechanismus nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Stoßstangen (5, 6) aus Fingern oder geraden Stangen bestehen, welche senkrecht in den Kanal hineinragen.

6. Mechanismus nach Anspruch 2, **dadurch gekennzeichnet, dass** die Antriebsrolle (11) und die freidrehende Rollen (12) zwischen zwei parallelen flachen Gestellen montiert sind.

7. Mechanismus nach den Ansprüchen 1 bis 5, **dadurch gekennzeichnet, dass** die Wand (4) des Kanals (3), durch welche die Stoßstangen (5, 6) hineinragen, zwei longitudinale Nuten (7, 8) aufweist, welche sich auf derselben Höhe wie die von den endlosen Bändern (9, 10) definierten Kreisläufe befinden, für den Durchgang der genannten Stoßstangen (5, 6).

8. Mechanismus nach den Ansprüchen 1 und 4, **dadurch gekennzeichnet, dass** der Kanal eine an seinem Ausgang montierte Tür (21) aufweist, welche sich öffnet, wenn die Verpackung (2') gegen dieselbe stößt, während diese von den Stoßstangen (5, 6) mitgenommen wird, wobei die genannte Tür zur geschlossenen Stellung durch eine Feder (22) gedrückt wird.

9. Mechanismus nach Anspruch 1, **dadurch gekennzeichnet, dass** er einen Detektor für den Durchgang von einer der Stoßstangen umfasst, wenn sich diese entlang des ganzen Kreislaufs der genannten Stoßstange bewegt hat.

Revendications

1. Mécanisme d'extraction pour machines distributrices de produits conditionnés, comprenant une trémie (1) dans laquelle les paquets (2) tombent avec les produits sélectionnés par l'utilisateur, **caractérisé en ce que** ladite trémie (1) mène à un canal (3) dans lequel pénètrent deux tiges-poussoirs (5, 6), à travers une de ses parois longitudinales (4), lesdites tiges-poussoirs (5, 6) étant espacées l'une de l'autre longitudinalement et étant situées à différente hauteur, lesdites tiges-poussoirs (5, 6) allant à travers le canal (3) et pouvant se déplacer le long de celuici dans une direction au moyen d'un mécanisme d'entraînement externe auquel elles sont reliées, le canal menant transversalement au côté de sortie des tiges-poussoirs (5, 6) sur un boîtier de réception.

2. Mécanisme selon la revendication 1, **caractérisé en ce que** le mécanisme d'entraînement comprend deux courroies continues (9, 10) qui sont montées, à différente hauteur, sur une série de rouleaux à axe vertical, l'un d'eux étant un rouleau menant (11) et les autres étant des rouleaux à rotation libre (12), définissant deux circuits parallèles qui comportent des sections qui se déplacent en parallèle l'une par rapport à l'autre et près de la paroi à travers laquelle pénètrent les tiges-poussoirs (5, 6), chaque courroie continue ayant une tige-poussoir.

3. Mécanisme selon la revendication 2, **caractérisé en ce que** les courroies continues (9, 10) sont des chaînes qui sont en prise avec des roues dentées (13, 14) solidaires aux rouleaux à axe vertical.

4. Mécanisme selon les revendications 1 et 2, **caractérisé en ce que** le canal (3) comprend une première section droite (3') et une deuxième section courbée (3") à travers lesquelles il mène à un boîtier de réception.

5. Mécanisme selon les revendications précédentes, **caractérisé en ce que** les tiges-poussoirs (5, 6) consistent en des doigts ou tiges droites qui pénètrent perpendiculairement à l'intérieur du canal.

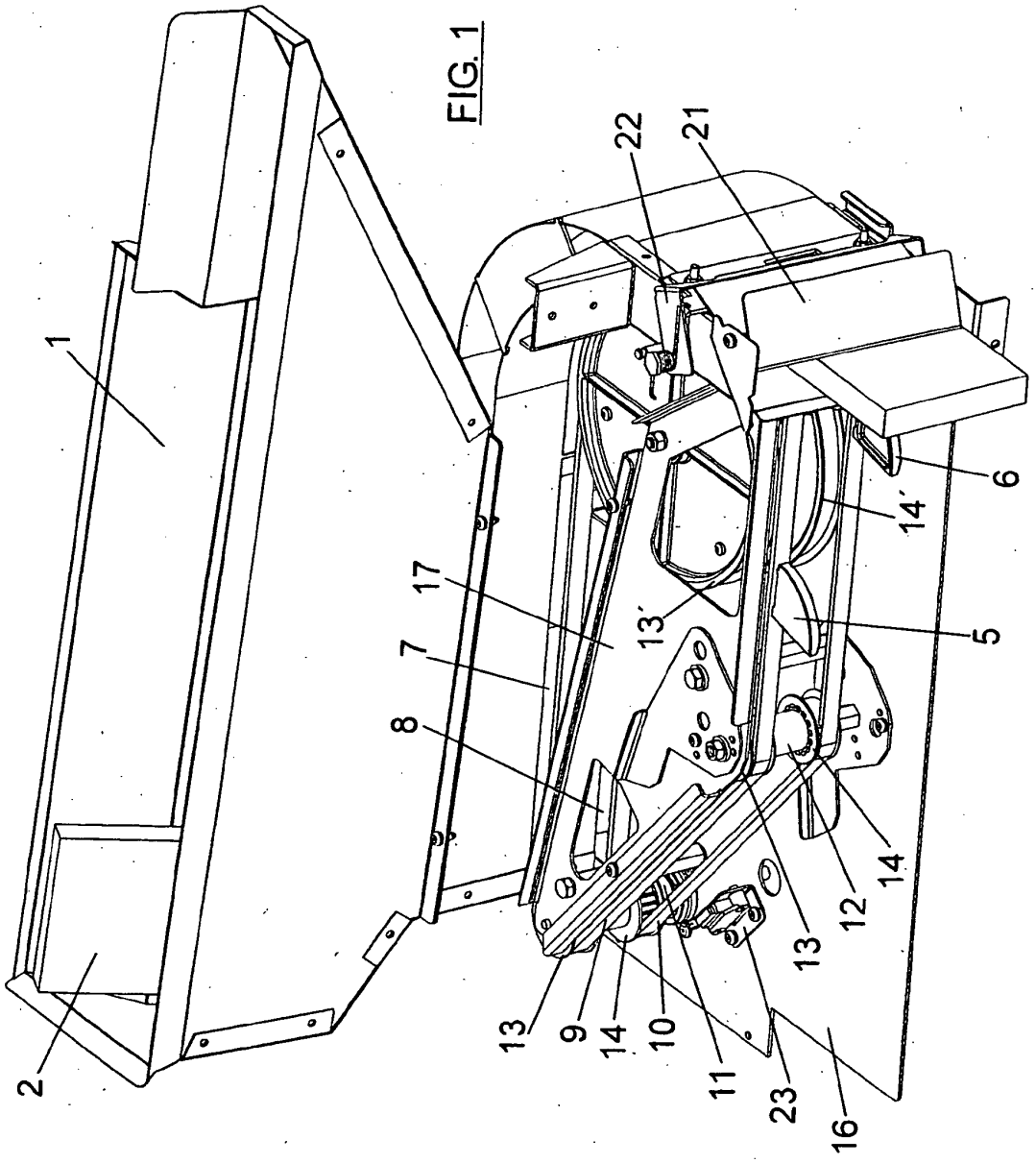
6. Mécanisme selon la revendication 2, **caractérisé en ce que** le rouleau menant (11) et les rouleaux à rotation libre (12) sont montés entre deux châssis plats parallèles.

7. Mécanisme selon les revendications 1 à 5, **caractérisé en ce que** la paroi (4) du canal (3) à travers laquelle pénètrent les tiges-poussoirs (5, 6) a deux rainures longitudinales (7, 8) situées à la même hauteur que les circuits définis par les courroies continues (9, 10), pour le passage desdites tiges-poussoirs (5, 6).

8. Mécanisme selon les revendications 1 et 4, **caractérisé en ce que** le canal a une porte (21) montée à sa sortie, qui s'ouvre lorsque le paquet (2') la pousse pendant qu'il est entraîné par les tiges-poussoirs (5, 6), ladite porte étant poussée vers la position de fermeture par un ressort (22).

9. Mécanisme selon la revendication 1, **caractérisé en ce qu'**il comprend un capteur du passage d'une des tiges-poussoirs, une fois qu'elle s'est déplacée le long de tout le circuit de ladite tige-poussoir.

FIG. 1



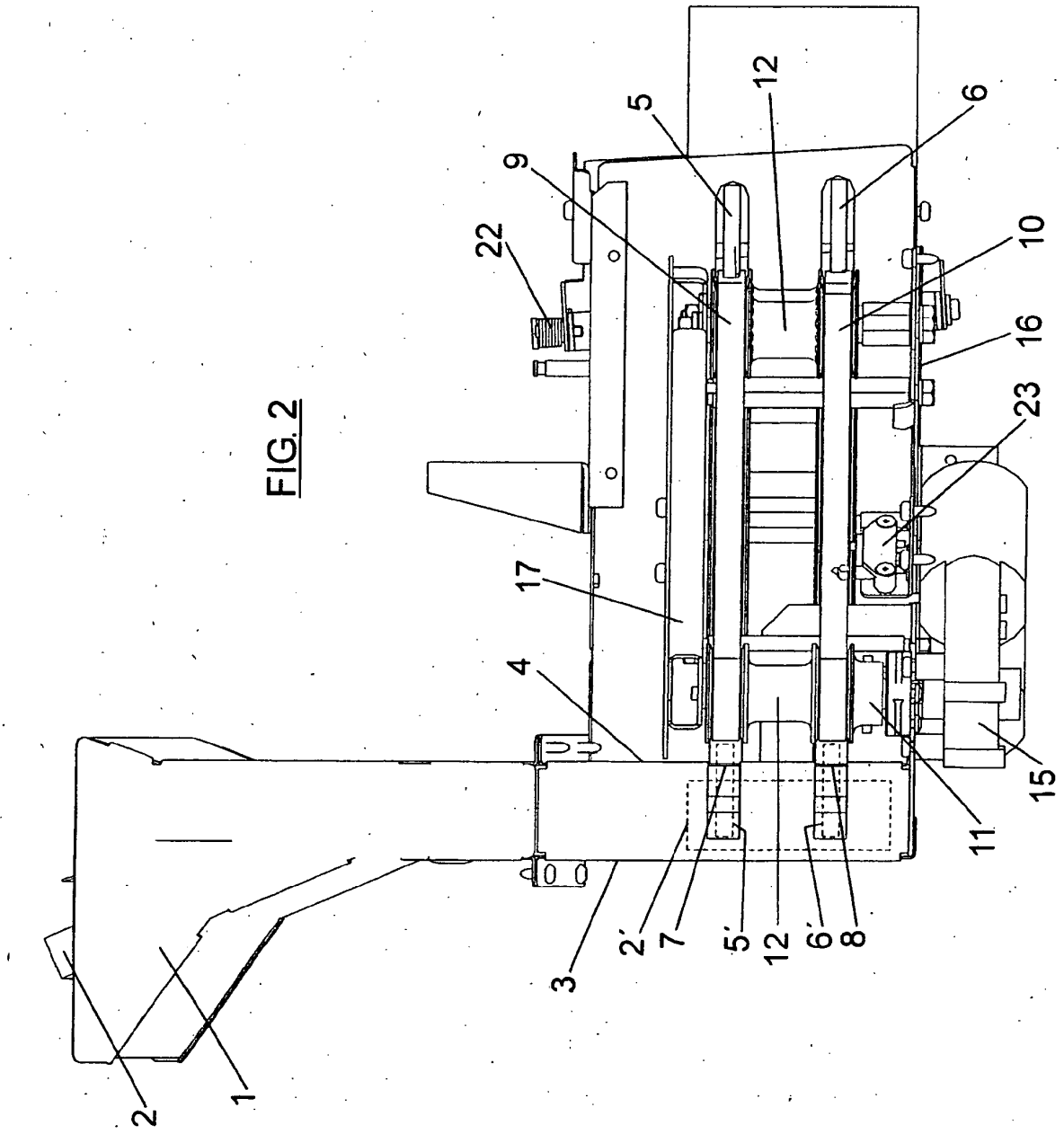


FIG. 2

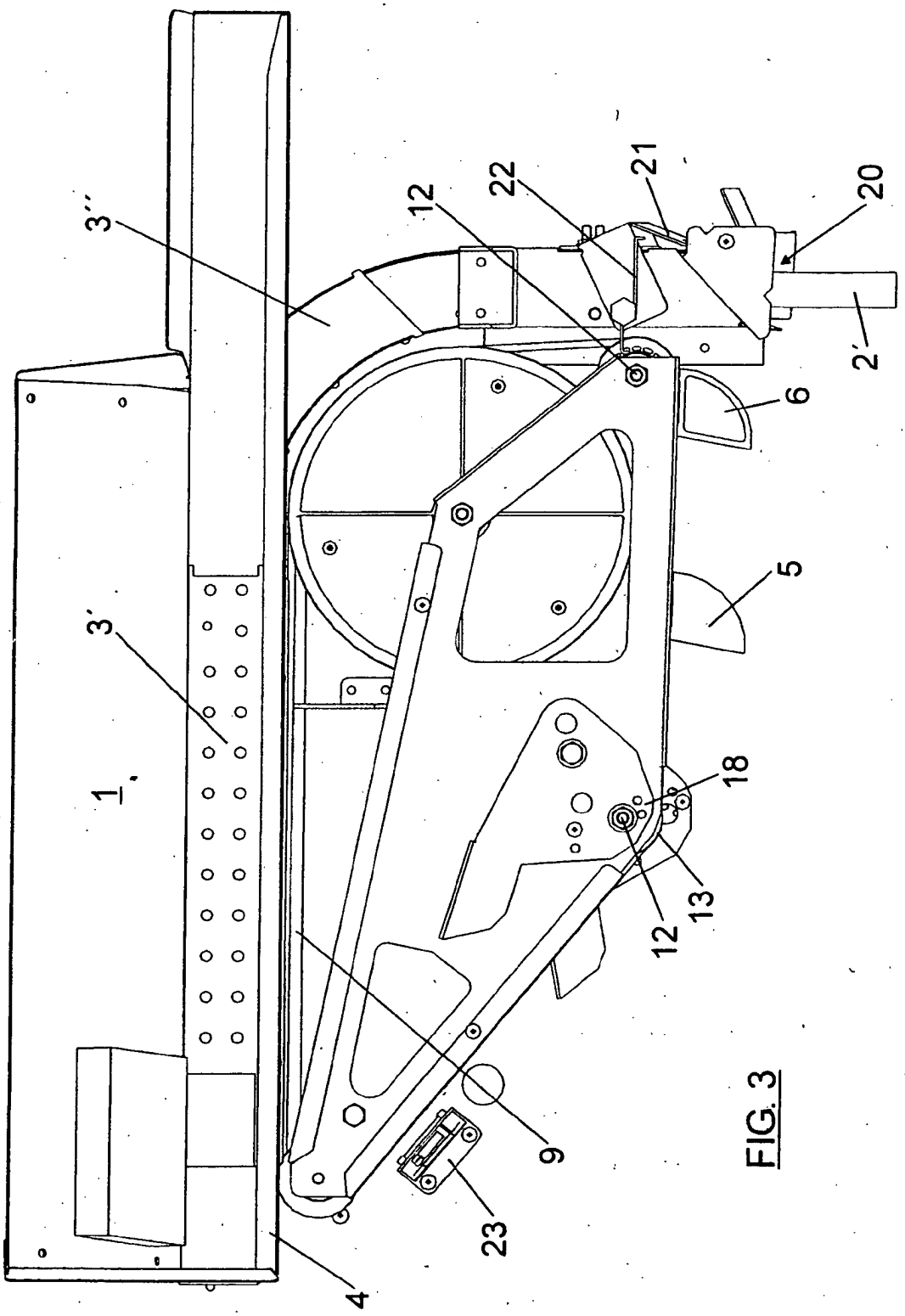


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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