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(71) Applicant: **Leiro E Hijos, S.L.**
36970 Sanxenxo-Pontevedra (ES)
(72) Inventor: **Leiro Lopez, Joaquin Fernando**
36970 Sanxenxo-Pontevedra (ES)
(74) Representative: **Temino Ceniceros, Ignacio**
Abril Abogados
Calle Amador de los Rios, 1 - 1°
28010 Madrid (ES)

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(54) **Food product selector**

(57) This invention is a food product selector that selects on the basis of the size of the product, especially devised for selecting such products as frozen or fresh bivalve molluscs, frozen food, etc., characterised by the fact that it is composed of a bed (1) on which a series of shafts (2) are arranged lengthwise, all of which are jointly motorised, each one of which is equipped with a series of rollers (3) that all have a helicoidal hole, with the par-

ticularity that inside each shaft the size of the respective rollers (3) become progressively larger from one end of the selector to the other, in such a way that the rollers (3) with the smallest holes lie closest to the selector loading zone so that the smallest products can drop through these smaller holes, whereas the rest of the products are conveyed towards the rollers (3) whose hole size is slightly larger, and so on and so forth, the biggest holes lying at the other end.

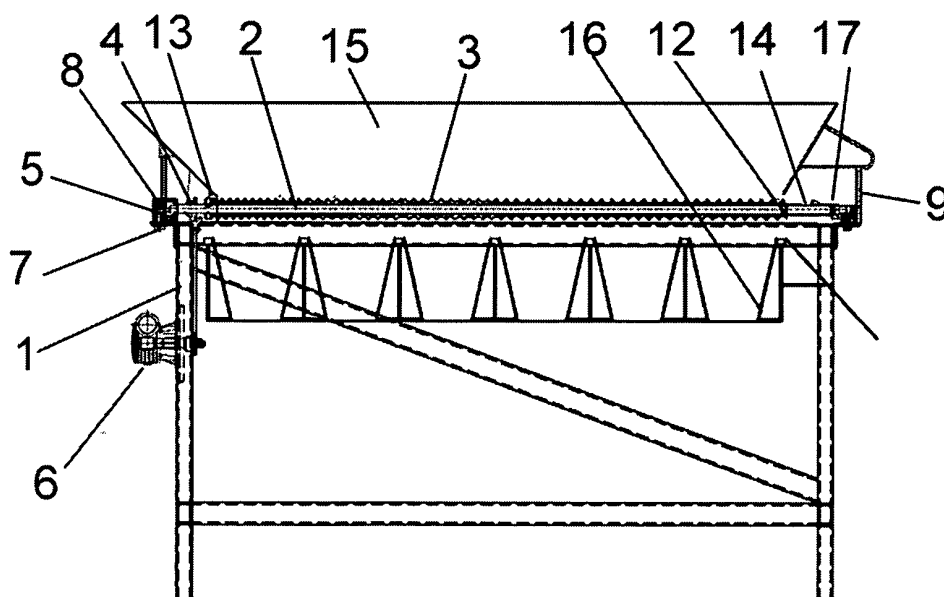


FIG. 2

Description

OBJECT OF THE INVENTION

[0001] This invention is an item of equipment for selecting, it is specifically a piece of apparatus that can select different products on the basis of their size, which has been especially designed to select food products, especially frozen or fresh bivalve molluscs, frozen food, etc.

[0002] The object of the invention is to have a piece of apparatus that enables its user to classify a mass of heterogeneous products where their size is concerned, into groups that have different pre-established sizes, so that the products in question reach the consumer forming groups on the basis of their size. It is also the object of the invention to ensure that the product selection process takes place in a fully automated way and without there being the slightest risk of the products being damaged in any way.

BACKGROUND TO THE INVENTION

[0003] It is clearly the case that any type of product has greater commercial acceptance if it reaches the consumer with a homogeneous size. However, with respect to the product we are dealing with, such as for example the bivalve molluscs referred to above, there are specimens whose sizes range greatly, and it is necessary to select them or classify them in order to achieve the effect that has just been mentioned, so that it is possible to establish different prices depending on how large or small the product in question is.

[0004] In addition to the traditional manual selection process, there are also items of selection equipment that are provided with a basic platform that contains windows running lengthwise that are scaled so that they gradually increase in width, in such a way that the mechanisms that they are equipped with for conveying the product along the platform ensure that the products concerned gradually fall into different hoppers, through different grooves, and that this process logically takes place on the basis of their size.

[0005] These selection devices are structurally complex, the conveying mechanisms are not 100% efficient, and sometimes physical pressure is exerted upon certain specimens or units of the product, which leads to them being damaged.

DESCRIPTION OF THE INVENTION

[0006] The food product selector that the invention proposes overcomes the aforementioned problems in a totally satisfactory way, by having a simpler structure, which operates in an optimum way and without the slightest risk of the product being damaged.

[0007] With a view to this and in order to be more specific, this selector is structured on the basis of a bed that

supports all its mechanisms and that suitably raises its work plane, upon which a series of shafts running lengthwise are mounted, running parallel to each other and lying equidistant from each other, upon which a series of machined rollers are mounted in helicoidal form, coinciding lengthwise, but whose machining depth grows progressively in the forward moving direction, in such a way that these rollers perform a dual purpose, on the one hand acting as conveyors, due to the revolving of the shafts, and on the other hand establishing between them chute windows that gradually increase in width in the same direction, so that the smallest products will fall through the first set of rollers, those that are slightly larger will fall through the second set of rollers, and so on and so forth, until the opposite end of the selector is reached, which is where the largest products of all will fall through.

[0008] A hopper lying above this roller platform makes it possible for the product to be supplied through the end corresponding to the narrower zones, and the roller platform is equipped with independent hoppers facing each size of rollers.

[0009] Every set of rollers is keyed to the respective shaft, the shafts lie upon the bed by means of bearings, and each shaft is equipped with a pinion at both ends through which it receives, jointly with all the rest, the movement of a suitably motorised conveyor belt which makes all the shafts rotate in the same direction, this belt lying on a supporting device in order to ensure that its own weight does not convey a catenary curve and become uncoupled from the intermediate pinions.

[0010] According to other characteristics of the invention, the bearings that support the shafts at the exit end are secured to the bed by means of scratched holes that allow the shafts to make a slight sideward movement, so that the shafts can open in fan-like fashion, bringing about differences in the gaps between the rollers, for the purpose of which the bearings at the other end, that is to say the input end, are fixed to the frame by means of a screw that enables it to tilt sideways.

DESCRIPTION OF THE DRAWINGS

[0011] A set of drawings is enclosed together with this description, for illustration purposes, and with a view to helping to give a better understanding of the characteristics of the invention in accordance with a preferred and practical embodiment thereof. These drawings form an integral part of the description and represent, in an illustrative and non-restrictive nature, the following:

Figure 1.- This figure shows a plan view of a food product selector realised in accordance with the object of this invention.

Figure 2.- This figure shows a side view of the same machine in longitudinal section.

Figure 3.- Finally, this figure shows a sectioned pro-

file of the machine.

REALISATION OF A PREFERRED EMBODIMENT OF THE INVENTION

[0012] It can be seen from the aforementioned figures that the selector concerned is composed of a bed (1), which forms a sort of bench support for the different mechanisms that, as has already been pointed out, defines a work plane that is suitably raised with respect to the floor.

[0013] A series of shafts (2) are arranged lengthwise along this bed, and a series of rollers (3) are mounted upon each one of them, further reference to which will be made later.

[0014] The end of each shaft is equipped with a pinion (4) and, as can be seen particularly in Figure 3, all the pinions for the respective shafts lie upon a belt (5), which simultaneously provides each one of them with a revolving movement in the same direction, this being operated by a gear motor (6), which is also mounted on the bed (1).

[0015] To ensure that all the pinions (4) engage with the belt (5), it must have a perfectly straight run under the pinions, for the purpose of which it has been planned that it be equipped with a rigid support (7).

[0016] Furthermore, each shaft (2) is mounted on the bed (1) by means of end bearings (8) and (9), which guarantee that there is no loss due to friction.

[0017] As can be observed particularly in Figure 3, the belt (5) is associated with the pinion at the gear motor outlet (6) by means of a pair of end pinions (10) that are arranged in alignment with the support (7), with which it also assists, as well as a chain stretcher (10').

[0018] Going back to the rollers (3), these are provided with a helicoidal hole, preferably machined with a spherical milling cutter, a series of rollers (3), (3'), (3'') ... running throughout the length of the shaft (2) whose aforementioned helicoidal holes progressively increase in size, in such a way that the gap formed between laterally adjacent rollers, gradually increases in a staggered way throughout the work plane, as can be seen especially in Figure 1, where the gaps between rollers have been given the reference numbers (11), (11'), (11''), ...

[0019] One of the ends of the rollers (3), which are clearly hollow so that they can house the respective shafts (2), is supported on a pin bolt (12), and they are axially secured at the other end by means of a buffer (13) that is fixed to the shaft with stud bolts, and lying beyond the above-mentioned pin bolt (12), that is to say beyond the roller outlet ends, there is a pushing device (14), whose function is to push out the products that have become stuck together.

[0020] A hopper (15) is located on the work platform defined by the rollers (3), the food product to be selected being placed upon the aforementioned hopper (15), while at the same time under these rollers (3) and, to be more specific, under each group of rollers (3), (3'), (3''), there are side hoppers (16) that collect the products of the dif-

ferent sizes, which are thus separated from each other on the basis of their size.

[0021] The bearings (9) located at the exit end of the work platform are mounted on a side section (17) of the bed (1) by means of holes in that section, which enables the shafts (2) to move slightly, this movement being facilitated by the fact that each one of the bearings (8) on their other end, is mounted on the support concerned by means of one single screw, which not only serves to secure them but also acts as an imaginary tilting shaft.

[0022] To a certain extent, this makes it possible to regulate the divergence between rollers and, as a result, regulate the distance between the gaps (11) between them, thereby regulating the size functionality of the selector.

Claims

1. st. - A food product selector, which is especially equipped to select such products on the basis of their size, **characterised by** the fact that it is composed of a bed upon which a series of jointly motorised shafts lie, each one of which is provided with several rollers, and all these rollers have a helicoidal hole, in such a way that the holes between the laterally adjacent rollers form gaps through which the product is dropped while at the same time being provided with means for conveying the rest of the products throughout the length of the selector, with the peculiarity that inside each shaft the size of the hole provided for each roller becomes progressively bigger from one end of the selector to the other, all of which has been designed in such a way that the rollers with the smallest holes lie in the selector loading zone, so that the smallest products fall through these holes, whereas the rest of the products are then conveyed towards the rollers whose hole sizes are the next size up, and so on progressively, so that the largest products eventually reach the largest holes.
2. nd. - A food product selector, as in Claim 1, **characterised by** the fact that the aforementioned shafts are provided with a pinion at one end, and all the pinions at that end of the shafts lie on a belt that, in turn, lies upon a support that runs in a straight line under the pinions, the chain in question being operated by a gear motor that also lies on the selector bed.
3. rd. - A food product selector, as in previous claims, **characterised by** the fact that each group of rollers is mounted on the shaft concerned creating a buffer at one of its ends on a pin bolt, whereas the other end is fixed by a buffer secured to the shaft by means of stud bolts, and a pushing device is positioned at the end of each roller alignment, so that it can push out the products that have become stuck together,

the shafts being supported on the bed by end bearings.

4. th.- A food product selector, as in previous claims, **characterised by** the fact that a food hopper is positioned on the platform defined by the rollers, there being several hoppers for receiving the selected product located under the aforementioned roller platform, to cater for the different roller sizes.
5. th.- A food product selector, as in previous claims, **characterised by** the fact that the bearings that support the shafts at the end of the intake are mounted on the bed by means of a series of screws that allow the shafts to tilt sideways, whereas at the opposite end the bearings are fixed to the bed through holes that enable the shafts to slightly tilt sideways, so that the shafts can open in a fan-like way, bringing about a variation in the gaps created between rollers.

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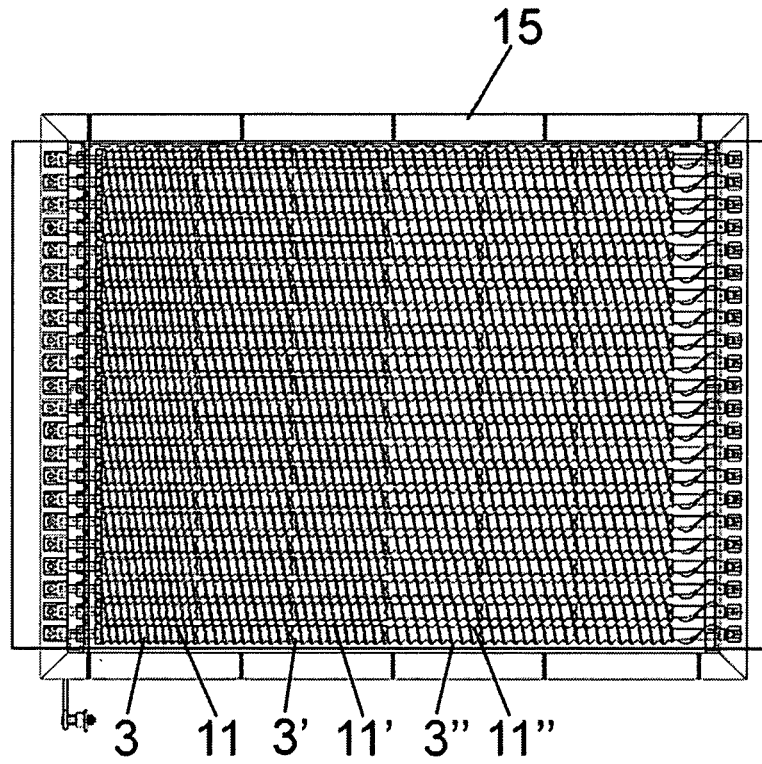


FIG. 1

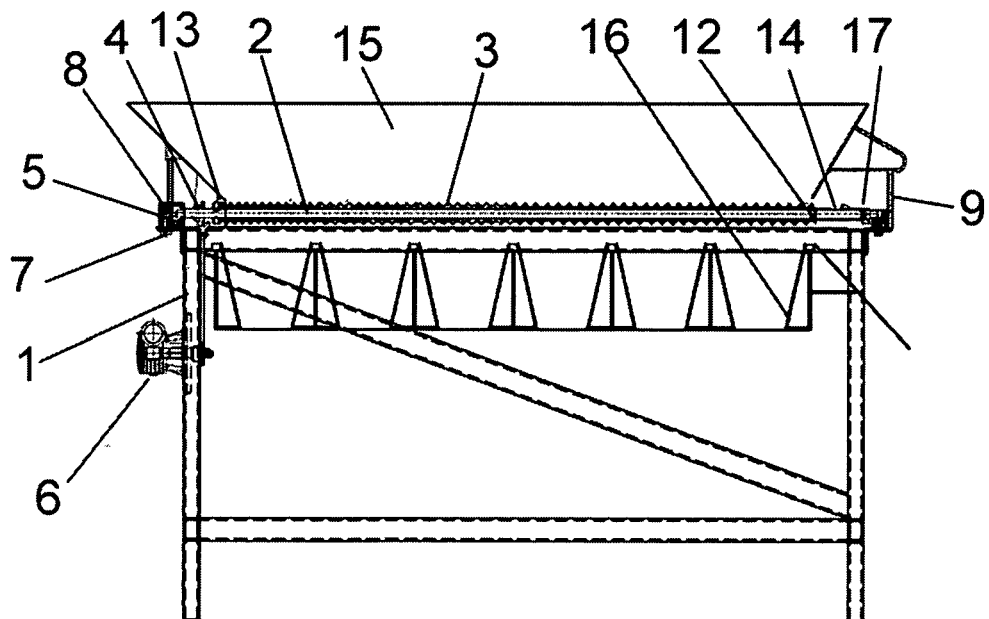


FIG. 2

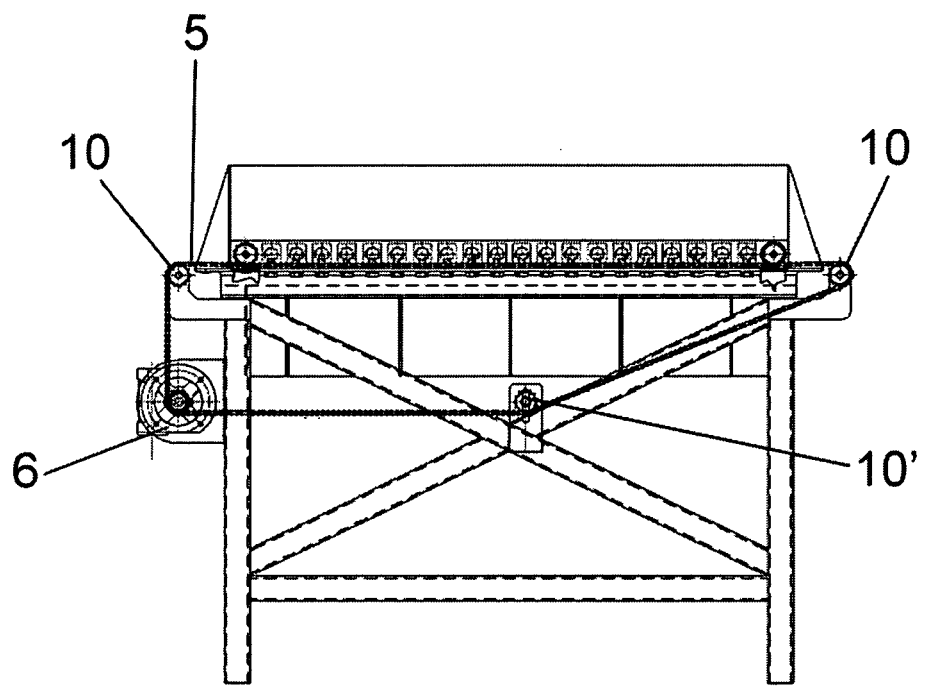


FIG. 3