Nov. 23, 1971 A. WICKERSHEIM 3,621,629
APPARATUS FOR PACKING PIECE GOODS SUCH AS POTATOES PACKED IN BAGS OR SIMILAR GOODS, INTO SACKS
Filed June 10, 1970 4 Sheets-Sheet 1

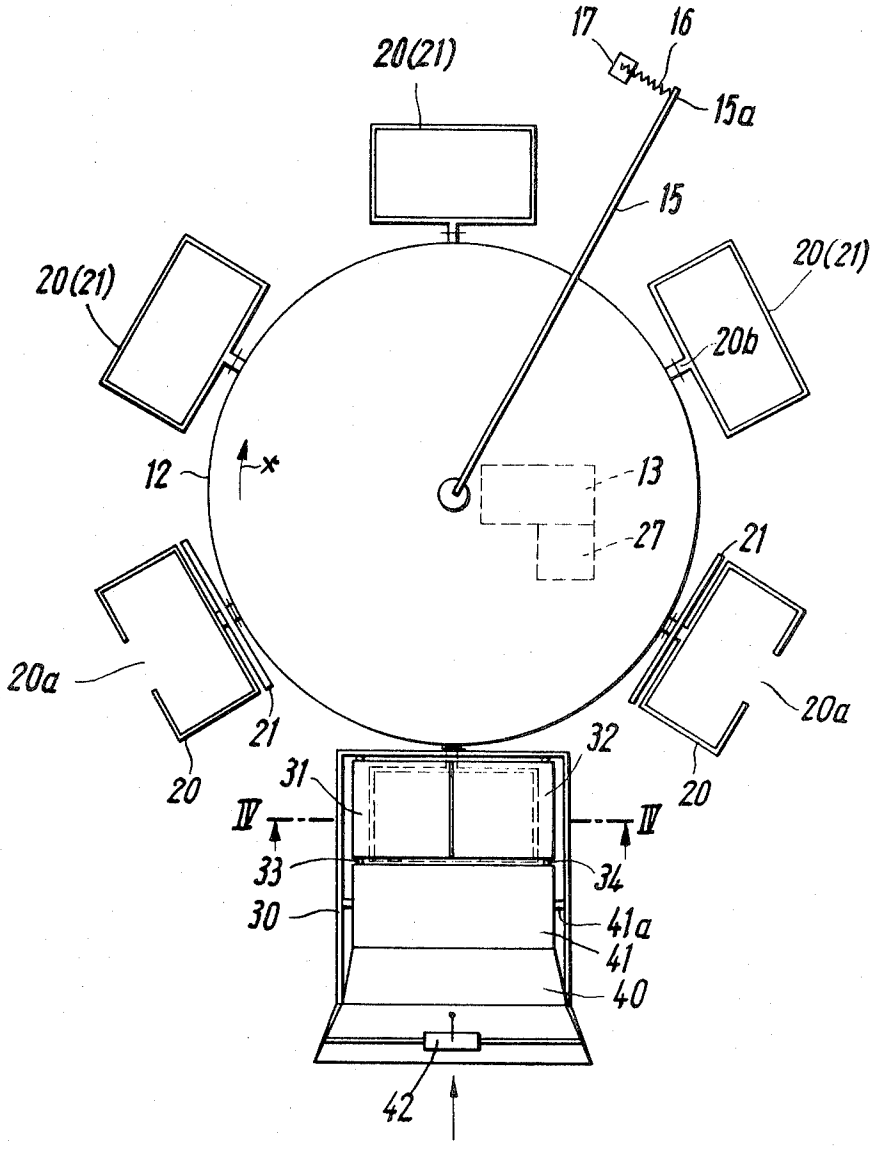


Fig. 1

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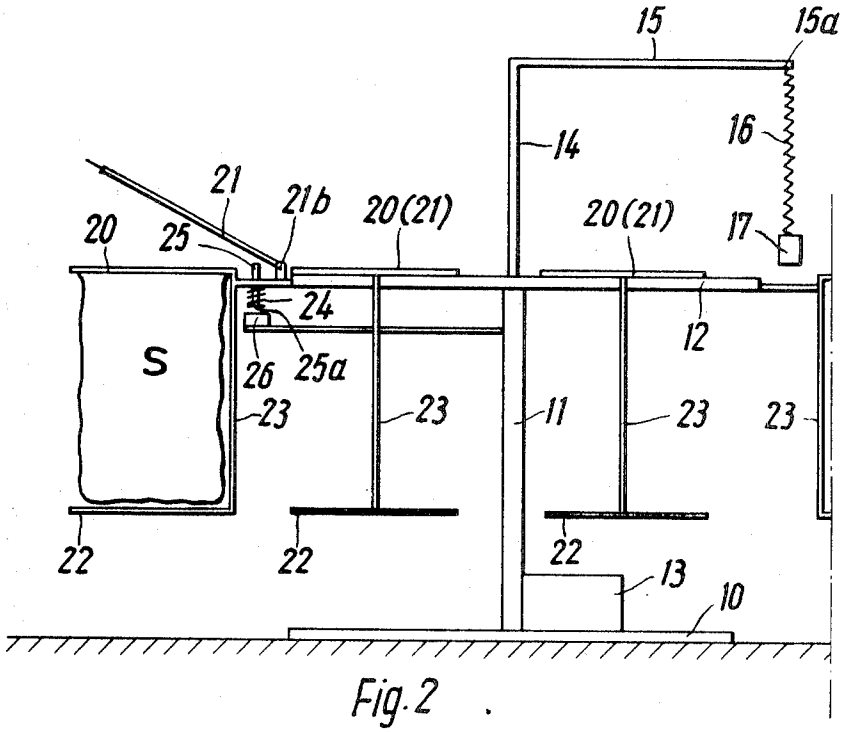


Fig. 2

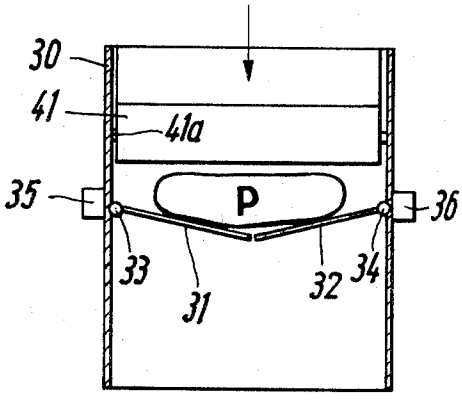


Fig. 4

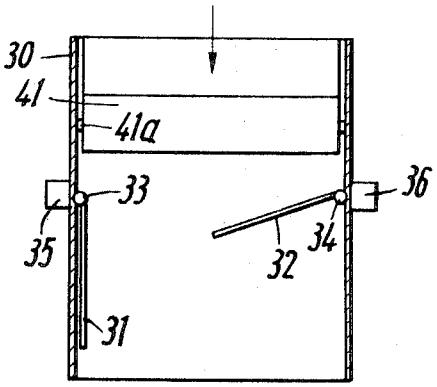


Fig. 5

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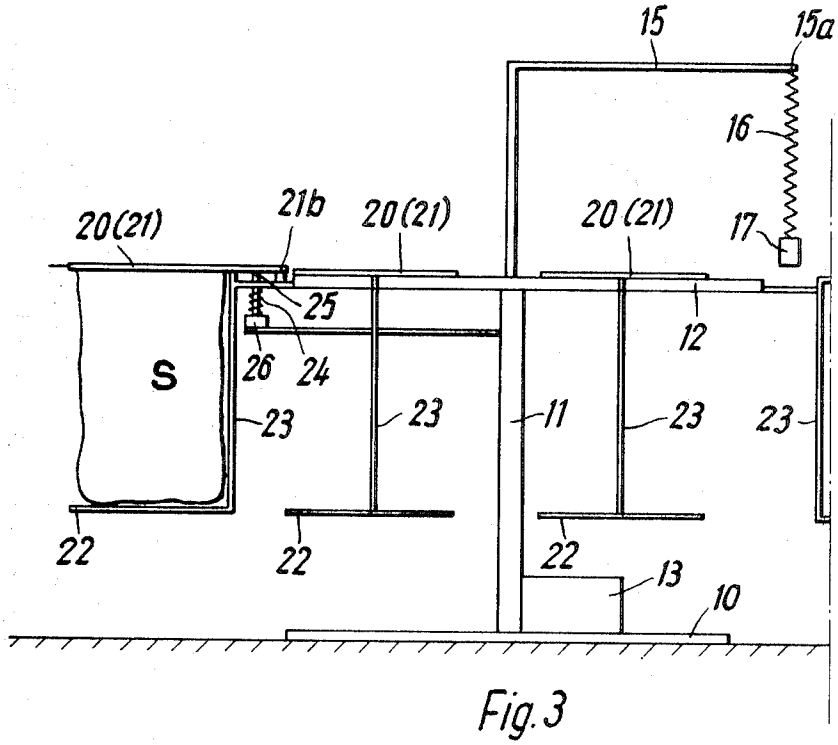


Fig. 3

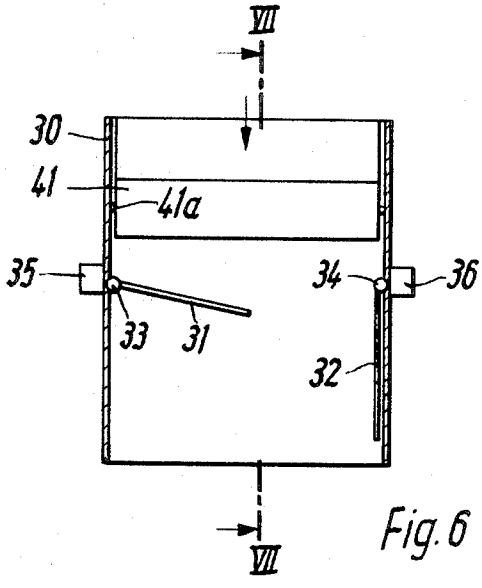


Fig. 6

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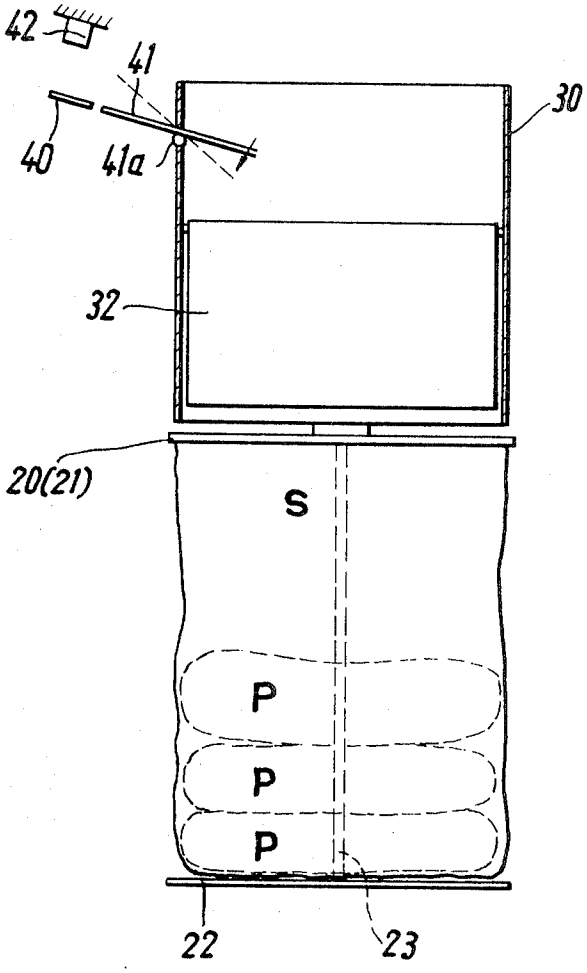


Fig. 7

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United States Patent Office 3,621,629
Patented Nov. 23, 1971

3,621,629

APPARATUS FOR PACKING PIECE GOODS SUCH AS POTATOES PACKED IN BAGS OR SIMILAR GOODS, INTO SACKS

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Filed June 10, 1970, Ser. No. 44,912
Claims priority, application Germany, Oct. 3, 1969, G 69 38 621.6
Int. Cl. B65b 57/20, 5/10
U.S. Cl. 53—59 6 Claims

ABSTRACT OF THE DISCLOSURE

A semiautomatic packing apparatus with a rotary sack holder for holding a plurality of sacks and a transfer container for introducing piece goods or articles packed in bags into the sacks. Means are provided for coordinating the rotation of the rotary sack holder with the discharge of articles from the transfer container so that the articles will be discharged into the sacks in a predetermined orientation.

This invention relates to an apparatus for packing piece goods such as potatoes packed in bags or similar articles, into sacks by means of a rotary sack holder comprising a base mounting a rotatable supporting disk with a plurality of circumferentially spaced annular mounting supports and respective clamping rings adapted to be swung downwardly for holding sacks which have been suspended at these supports.

Heretofore employed semi or fully automatically operating weighing and counting devices for piece or lump goods such as fruits, and filling apparatus for sacks are generally provided, in the filling area, with supporting means in which the sacks that are to be filled with the goods are suspended and held open by the supporting means. After the sacks have been filled, they are removed from their supports and other empty sacks are suspended therein. For performing these two operations, additional operators are required, particularly if high filling speeds are aimed at, because removing the filled sacks, closing the filled sacks and inserting empty sacks into the sack support is relatively time consuming since the heretofore known sack holders are adapted to hold only one sack at a time.

There has also been proposed a supporting means for bags, sacks and the like which comprises a base plate on which a supporting disk with a central vertical column is movably mounted, the vertical column being provided, at its upper free end, with several radially protruding annular mountings open at their front ends, together with clamping rings which may be swung down onto the mounting for securing bags or sacks suspended in the mounting. The vertical column carries at its upper free end three jibs each having an annular mounting and above the jibs a supporting disk on which are movably mounted several clamping rings, one ring for each mounting. This sack or bag holder should however not be confused with high capacity packing or filling machines allowing high outputs, since apparatus of the former type are operated mainly manually.

It is therefore a principal object of the present invention to provide a novel and improved apparatus for packing piece goods such as potatoes packed in bags or similar articles, into sacks.

Another object of the present invention is to provide an apparatus of the above type which is economical and adaptable to high speed feeding devices for potatoes packed in bags thus allowing high packing speeds.

In accordance with the present invention, a packing apparatus comprises a machine frame mounting a box-

shaped transfer container above the path of movement of the annular mounting supports and clamping rings which are arranged on the supporting disk, and motor drive means for rotating the supporting disk step-by-step, the transfer container comprising a feeding plate and a counting device above the feeding plate, at its feed end, and a bottom formed by a pair of hinged doors which are adapted to be alternately swung downwardly by means of a solenoid associated with either door, the solenoids being controllable by a counting device coupled to the drive motor through a stepping mechanism for rotating the supporting disk step-by-step.

In order to provide an efficient transfer of the individual packings into the sacks which are suspended in the rotary sack holder a tiltable transfer plate is arranged above the bottom doors of the transfer container at the discharge end of the feeding plate. A spring biased actuating cam is provided on each of the annular mounting supports adjacent to the periphery of the rotating supporting disk and within the field of traverse of the associated clamping ring, the actuating cam engageable by the clamping ring when the ring is in a sack clamping position, a lower end portion of the actuating cam passed through an arm-shaped section of the mounting support and being adapted to be operatively coupled to a switch a device arranged below the transfer container, the switch device controlling the stopping of the rotating supporting disk when a mounting support in which a sack is suspended has been rotated into a position below the transfer container.

A preferred embodiment of the invention will be described in the following with reference to the appended drawings wherein:

FIG. 1 is a top plan view of a packing apparatus together wth a rotary sack holder, according to the present invention.

FIGS. 2 and 3 are lateral view of the apparatus with the clamping rings in different positions.

FIGS. 4 to 6 are vertical sectional views along the line IV—IV of FIG. 1 and show different positions of the two hinged doors in the transfer container for the packings.

FIG. 7 is a vertical sectional view, taken on line VII—VII of FIG. 6.

According to a preferred embodiment of the invention which is shown in FIG. 1 the new packing apparatus for piece goods packed in bags such as potatoes comprises a rotary sack holder with a base plate **10** to which is attached a vertical column **11** defining a pivot axis for a supporting disk **12** which is supported at the upper free end of the vertical column **11**. The supporting disk **12** is rotated in the direction of the arrow *x* by means of a schematically indicated drive motor **13**. The pivot axis of the supporting disk **12** preferably consists of a hollow shaft which surrounds a supporting bar **14** which is firmly attached to the base plate **10**. The supporting bar **14** extends beyond the plane defined by the supporting disk **12** and carries a jib **15** at its upper end. The jib **15** includes a right angle with the supporting bar **14**. A connecting member such as a spring **16** or the like is attached to the free end **15***a* of the jib **15**, and to the connecting member **16** is attached a manually operated closing device **17** for closing filled sacks which may be of a conventional design.

Six annular mounting supports **20** of an approximately rectangular configuration are equally spaced around the periphery of the supporting disk **12** and are provided at their front sides with apertures **20***a* facilitating the insertion of empty sacks S. Any convenient number of mounting supports **20** may be provided on the supporting disk **12**. The mounting supports **20** are attached to the supporting disk **12** through arm-shaped sections **20***b*. In these arm-shaped sections **20***b* are pivotably mounted at **21***a* clamping rings or clamping stirrups **21** (see FIGS. 2

and 3). Supporting platforms **22** for supporting the sacks S are provided below the mounting supports **20** and the clamping rings **21**, these platforms being spaced from the mounting supports **20** by means of brackets **23** the lengths of which approximately correspond to the depth of the sacks S.

In the arm-shaped sections **20***b* of the supports **20** are arranged actuating cams **25** which are biased by springs **24** so that when the clamping rings **21** have been swung into their upper positions the cams **25** will be urged upwardly by the springs **24** and will thereby be withdrawn from the range of action of a switch device **26** which may consist of an ON-OFF switch arranged below the supporting disk **12** in the path of movement of the actuating cams **25**. The switch device **26** is coupled to a stepping mechanism **27** (FIG. 1) which controls the step-by-step rotation of the supporting disk so that the disk will be rotated through an arc corresponding to two mounting supports **20** and this rotation will always be interrupted as soon as a mounting support **20** has arrived in the discharge zone of a box-shaped transfer container **30** which is arranged above the path of movement of the mounting supports **20**. If one of the clamping rings **21** for example has not been swung down for clamping a sack S suspended in its associated mounting support **20** the actuating cam **25** cannot engage the switch device **26** since the spring **24** urges the cam **25** upwardly. Therefore the rotation of the supporting disk **12** is not interrupted at this mounting and the drive motor **13** rotates the supporting disk **12** further until a mounting support **20** in which a sack S suspended in the mounting **20** is clamped thereon by means of the respective clamping ring **21** will be passing below the transfer container **30**. When the clamping rings **21** are in their clamping positions the lower end portions **25***a* of the actuating cams **25** engage the switch device **26** (FIG. 3).

The transfer container **30** which may be arranged together with the rotary sack holder in a machine frame which is not shown in the drawings or which may also be attached to the rotary sack holder in any other convenient manner and forming an integral assembly therewith comprises a box-shaped casing in which two hinged doors **31, 32** are provided and form the bottom plate of the casing. These hinged doors **31, 32** are mounted on swivel axes **33, 34** which extend in a direction parallel to a pair of opposing longitudinal walls of the transfer container **30**. The swivel movements of the hinged doors **31, 32** are effected by solenoids **35, 36** or any other suitable drive means. The hinged doors **31, 32** are arranged in the transfer container **30** in such a manner that in one operative condition the two doors close the bottom of the transfer container **30** in their upper positions whereas in another operative condition the hinged doors **31, 32** are actuated alternately into an open downward position so that packings P introduced into the transfer container will be laid into the sack S below the transfer container **30** alternately on the left side or on the right side thereof (FIGS. 4–6).

At its discharge side the transfer container **30** is provided with a guide or feeding plate **40** above which is arranged a counting device **42** in the path of movement of the packings. This counting device **42** may be a light barrier or an electronic counting bar which is coupled to the drive motor **13** for rotating step-by-step the supporting disk **12** through the stepping mechanism **27** and to the solenoids **35, 36** for the hinged doors **31, 32** of the transfer container **30**. The swivel movements of the hinged doors **31, 32** of the transfer container **30** and the step-by-step rotation of the supporting disk **12** are suitably coordinated.

The guide or feeding plate **40** is provided at its discharge side with a tilting transfer plate **41** attached to a swivel axis **41***a* which extends transversely to the feed direction of the packings P and is mounted on the walls of the transfer container **30**.

The operation of the apparatus of the present invention is as follows: The goods such as potatoes which are packed in bags are fed to the packing apparatus via the guide or feeding plate **40** or a feed conveyor (not shown). Every packing which passes the counting device **42** is counted. When for example ten packings P have been transferred through the transfer container **30** into a sack S arranged below the container, the counting device **42** controls the continued rotation of the supporting disk **12** by means of suitable control devices so that the sack S which has been filled with the packings P is moved from the fill region and a new empty sack S is brought into a position below the transfer container **30**. The packings P which have been discharged from the guide or feeding plate **40** onto the tilting plate **41** are first introduced into the transfer container **30** the discharge opening of which is closed by the hinged doors **31, 32**. After a relatively short duration either the door **31** or the door **32** will be opened (FIGS. 5 and 6) so that the packings P will be laid into the sack S below the transfer container alternately on the left or on the right side. The relatively short period of dwell of the packing P in the container when the hinged doors **31, 32** are closed (FIG. 4) is an essential advantage since by this expedient the packing P will be introduced sideways into the sack S, after one of the hinged doors has opened. This expedient and particularly the arrangement of the tilting transfer plate **41** avoid that the packings P which have been introduced into the sack S will be arranged at random inside the sack. The packing apparatus of the present invention provides for an even stacking of the packings P in the sacks S so that sacks S which are filled with packings P may be stacked on pallets and the like and form thereon compact stacks. Another advantage of the packing apparatus of the present invention is that by the control of the step-by-step rotation of the supporting disk **12** through the clamping rings **21** it cannot occur that packings P will be discharged at mountings **20** in which no empty sacks S are suspended. On the contrary, the control through the clamping rings **21** results in a continued rotation of the supporting disk **12** until a mounting **20** in which an empty sack S is suspended has been moved underneath the transfer container **30**. By the coordinated control of the whole apparatus high speeds of packings bags into sacks may be achieved. The sacks S which receive the packings P may consist of polyethylene sheet, of conventional sack material or of any other suitable material.

What is claimed is:

1. An apparatus for packing piece goods such as potatoes packed in bags or similar articles, into sacks by means of a rotary sack holder comprising a base mounting a rotatable supporting disk with a plurality of circumferentially spaced annular mounting supports and respective clamping rings adapted to be swung downwardly for holding sacks which have been suspended at these supports, said apparatus being characterized, according to the invention, by a machine frame mounting a box-shaped transfer container above the path of movement of the annular mounting supports and clamping rings which are arranged in the supporting disk, and a motor drive means for rotating the supporting disk step-by-step, the transfer container comprising a feeding plate and a counting device above the feeding plate at its feed end, and a bottom formed by a pair of hinged doors which are adapted to be alternately swung downwardly by means of a solenoid associated with either door, the solenoids of the two doors being controllable by a counting device coupled to the drive motor through a stepping mechanism for rotating the supporting disk step-by-step.

2. An apparatus as recited in claim **1** wherein a tiltable transfer plate connected to a swivel axis which extends perpendicularly to the feeding path of the packings is arranged above the bottom doors of the transfer container at the discharge end of the feeding plate.

3. An apparatus as recited in claim **1** wherein a spring biased actuating cam is provided on each of the annular

mounting supports adjacent to the periphery of the rotating supporting disk and within the field of traverse of the associated clamping ring, the actuating cam engageable by the clamping ring when the ring is in a sack clamping position, a lower end portion of the actuating cam passed through an arm-shaped section of the mounting support and being adapted to be operatively coupled to a switch device arranged below the transfer container, the switch device controlling the stopping of the rotating supporting disk when a mounting support in which a sack is suspended has been rotated into a position below the transfer container.

4. An apparatus as recited in claim 1 wherein a supporting bar holding a jib including a right angle with the supporting bar is arranged along the pivot axis of the supporting disk and forms an extension thereof, the pivot axis being arranged in the form of a hollow shaft, and a manually operated closing means for closing filled sacks attached to the free end of the jib through a vertically

adjustable connecting member such as a spring or the like.

5. An apparatus as recited in claim 1 wherein six mounting supports together with associated clamping rings are provided around the periphery of the supporting disk.

6. An apparatus as recited in claim 1 wherein the swivelling movement of the bottom doors of the transfer container and the step-by-step rotation of the supporting disk are coordinated.

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U.S. Cl. X.R.

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