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(54) Vibrating machine, particularly for the surface finishing of parts, with automatic unloading means.

(57) The present invention relates to a vibrating machine, particularly for the surface finishing of parts, with automatic unloading means, which comprises a tank body (1) provided with vibration means and connected to a supporting frame (2) with the interposition of anti-vibration means. The tank body (1) is provided with an internal bottom (3) which defines a ramp-like portion (4) for sending the parts toward an unloading plane (5) by means of a connecting wing (6) associated with the unloading plane (5) and removably associable with said ramp-like portion (4) for the extraction of the finished parts. The peculiarity of the invention resides in the fact that it comprises a lower detector (12) of the positioning of the wing (6) in lowered position on the ramp-like portion (4) and at least one intervention timer which controls the time of passage of the connecting wing (6) from the raised position to the lowered position and drives the actuation of motor means (10) for moving the connecting wing.

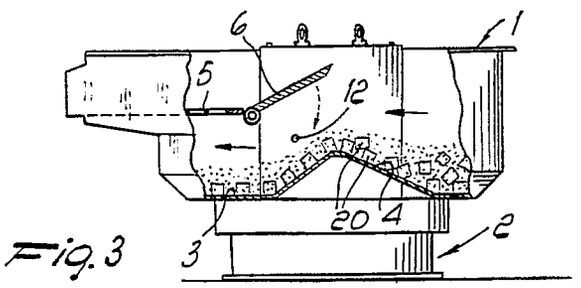

Fig. 3

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VIBRATING MACHINE, PARTICULARLY FOR THE SURFACE FINISHING OF PARTS, WITH AUTOMATIC UNLOADING MEANS

The present invention relates to a vibrating machine, particularly for the surface finishing of parts, with automatic unloading means.

As is known, vibrating tanks are currently commercially available for performing surface finishing operations such as smoothing, deburring and the like which substantially have a tank body which is provided with vibration means and is supported by a frame with the interposition of anti-vibration means. A bottom is defined inside the tank body and has a ramp-like portion which extends in a spiral and acts as a guiding element for sending the parts to a connecting wing which connects to an unloading plane.

Said connecting wing is pivoted to the unloading plane and is associated with a lever which can be accessed from the outside of the tank and is manually actuated by an operator; the actuation of the lever moves the connecting wing to a lowered position in which it connects to the ramp-like portion so as to create a path for the outward unloading of the processed parts.

In this kind of tank, the operation of lowering the connecting wing must be performed manually by the operator, who inserts said connecting wing in a mass constituted by the finished parts and by the loose material used for the smoothing, polishing, and the like, of the finished parts. The operator takes precautions to prevent the processed parts from being retained between the upper portion of the ramp portion and the connecting wing, and if this event occurs he consequently slightly lifts the connecting wing, so as to allow the passage of any possibly trapped part and continues the rotation of the connecting plane until it arranges itself in its lower position, i.e. as a continuation of the ramp-like portion.

This aspect has so far prevented the provision of automatic actuations for positioning the connecting wing in lower position, since there is the risk of trapping or catching parts being processed.

It is therefore necessary to provide an operator who manually performs the operation of inserting the connecting wing in the tank to align it with the ramp-like portion and, on the basis of his experience and sensitivity, is capable of preventing the jamming of parts between the connecting wing and the ramp.

The aim of the invention is indeed to eliminate the previously described disadvantages by providing a vibrating machine, particularly ior the surface finishing of parts, which allows to automatically perform the insertion of the connecting wing in the tank body without running the risk of trapping parts which would not allow the correct positioning of said connecting wing.

Within the scope of the above described aim, a particular object of the invention is to provide a vibrating machine in which the automatic unloading of the parts can be obtained with extremely simple means such as to not cause impediment in the execution of the machine itself.

Another object of the present invention is to provide a vibrating machine, particularly for the surface finishing of parts, which gives the greatest assurances of reliability and safety in operation and furthermore allows to achieve a significant reduction in labor.

Not least object of the present invention is to provide a vibrating machine, particularly for the surface finishing of parts, which is easily obtainable starting from commonly commercially available elements and materials and which is furthermore highly competitive from a merely economical point of view.

The above described aim, the objects mentioned and others which will become apparent hereinaf ter are achieved by a vibrating machine, particularly for the surface finishing of parts, with automatic unloading means, according to the invention, which comprises a tank body provided with vibration means and is connected to a supporting frame with anti-vibration means interposed, said tank body having an internal bottom which defines a ramp-like portion for sending the parts toward an unloading plane by means of a connecting wing associated with said unloading plane and removably associable with said ramp-like portion for the extraction of the finished parts, characterized in that it comprises a lower detector of the arrangement of said wing in lowered position on said ramp-like portion, at least one intervention timer which controls the time of passage of said connecting wing from said raised position to said lowered position and drives the actuation of motor means for the movement of said connecting wing.

Further characteristics and advantages will become apparent from the description of a preferred but not exclusive embodiment of a vibrating machine, particularly for the surface finishing of parts, with automatic unloading means, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a schematic elevation view of the vibrating machine;

figure 2 is a top plan view of the vibrating machine;

figure 3 is a schematic view of the vibrating

machine during normal operation;

figure 4 is a schematic view of the step of lowering the connecting wing, with a part schematically trapped between the connecting wing and the ramp-like portion;

figure 5 is a view of the step of partial lifting of the connecting wing;

figure 6 is a view of the connecting wing when correctly positioned.

With reference to the above described figures, the vibrating machine, particularly for the surface finishing of parts, with automatic unloading means, according to the invention, comprises a tank body 1 provided with vibration means which is supported by a supporting frame 2 with the interposition of per se known anti-vibration means.

The tank body 1 is internally provided with a bottom 3 with a circular configuration which defines a ramp-like portion 4 which extends substantially in the shape of a spiral.

An unloading plane 5 for the outward conveyance of the parts is provided in the upper part of the tank body and can be connected to the ramp-like portion by means of a connecting wing 6 which is pivoted to said unloading plane.

The connecting wing is oscillable so that it can be placed in a raised position during normal operating steps and so that it can be subsequently lowered, inserting it in the mass being processed, so as to arrange itself in alignment with the ramp-like portion and consequently constitute a path for the extraction of the parts toward the output.

The connecting wing 6 is actuated by means of motor means which are advantageously constituted by a cylinder 10 which rotates the connecting wing about its rotation axis; said cylinder 10 is controlled by control means constituted by a lower detector 12 which detects the correct positioning of the connecting wing in alignment with the ramp-like portion.

The detector 12 is controlled by intervention timers which are mounted inside the control console and comprise a first intervention timer on which a preset time, within which the connecting wing must arrange itself in alignment with the ramp, can be set. If the connecting wing fails to position itself correctly within the preset time, since for example a part 20 has remained trapped between the connecting wing and the ramp-like portion, as illustrated in figure 4, the actuation command to the motor means is reversed and the connecting wing is raised for a second period of time which is also preset and controlled by a second timer.

The motor means are controlled by a cycle timer and by the timers, so that in practice the descent operation is repeated continuously until the connecting wing arranges itself in alignment with the ramp-like portion, thus ensuring the correct operation of insertion of the connecting wing inside the mass being processed in the tank body, within the time preset by the first timer.

In the practical embodiment it is possible to set an automatic cycle during which there is a time for the permanence of the parts being processed inside the tank.

After the time preset by the cycle timer has ended, the first timer allows the motor means to lower the connecting wing, which interrupts the operation of the motor means if it arrives at the sensor within the preset time, whereas if a part remains trapped between the connecting wing and the ramp-like portion, since the correct positioning has not occurred within the preset time, the second timer allows the upward return of the connecting wing for a set time, activating the first timer which resets a time required to complete the descent of the connecting wing.

These operations are cyclically repeated until the connecting wing arrives at the detector and is consequently correctly positioned.

The detector can be provided of any kind, since it must simply detect the position of the connecting wing for the subsequent driving of the motor means by means of the timers.

From what has been described it can thus be seen that the invention achieves the proposed aim and objects; in particular the fact is stressed that a vibrating machine is provided in which it is possible to perform the unloading operations automatically, without the need for the operator who manually inserts the connecting wing inside the mass being processed.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details mav furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, as well as the contingent shapes and dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Vibrating machine, particularly for the surface finishing of parts, with automatic unloading means, which comprises a tank body (1) provided

with vibration means and connected to a supporting frame (2) with anti-vibration means interposed, said tank body (1) having an internal bottom (3) which defines a ramp-like portion (4) for sending the parts toward an unloading plane (5) by means of a connecting wing (6) which is associated with said unloading plane (5) and is removably associable with said ramp-like portion (4) for the extraction of the finished parts, characterized in that it comprises a lower detector (12) of the positioning of said wing (6) in lowered position on said ramp-like portion (4), at least one intervention timer which controls the time of passage of said connecting wing (6) from said raised position to said lowered position and drives the actuation of motor means (10) for the movement of said connecting wing (6).

2. Vibrating machine according to claim 1, characterized in that said motor means (10) are constituted by a cylinder (10) which acts on the pivoting pin of said wing (6) for connecting to said unloading plane (5).

3. Vibrating machine according to the preceding claims, characterized in that it comprises a first intervention timer which can be preset for a first time interval within which said connecting wing (6) must reach said ramp-like portion (4) and a second timer which can be preset for a second time interval during which an at least partial upward return of said connecting wing (6) is performed if said connecting wing (6) fails to position itself at said detector (12) during said first time interval.

4. Vibrating machine according to one or more of the preceding claims, characterized in that it comprises a cycle timer for setting the time interval for the outward unloading of the material.

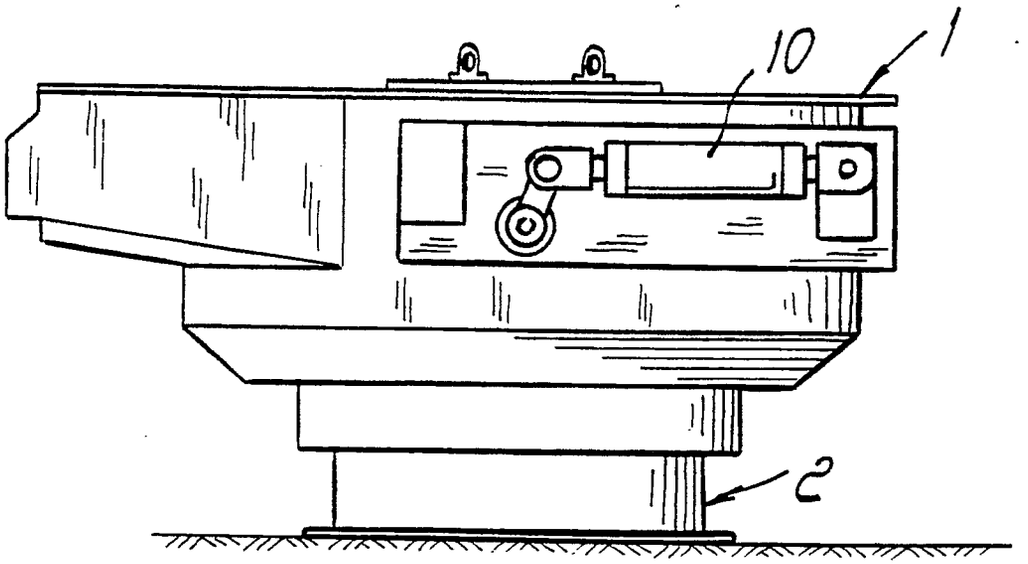

Fig.1

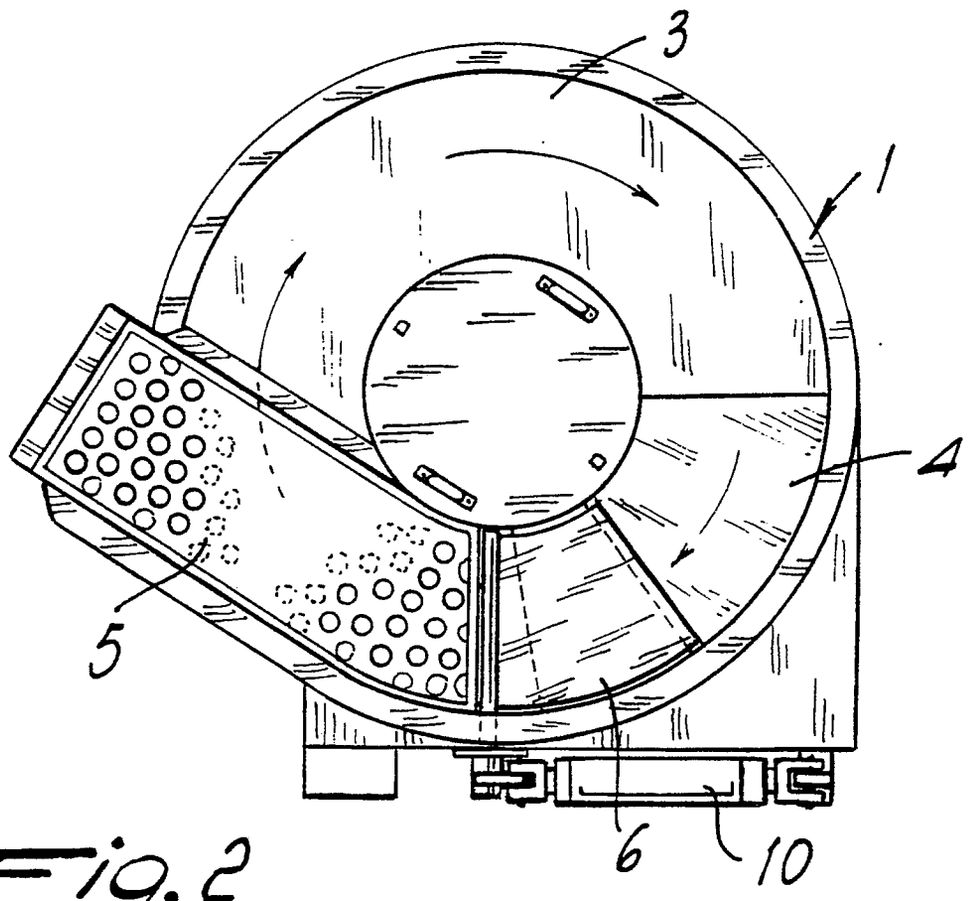

Fig.2

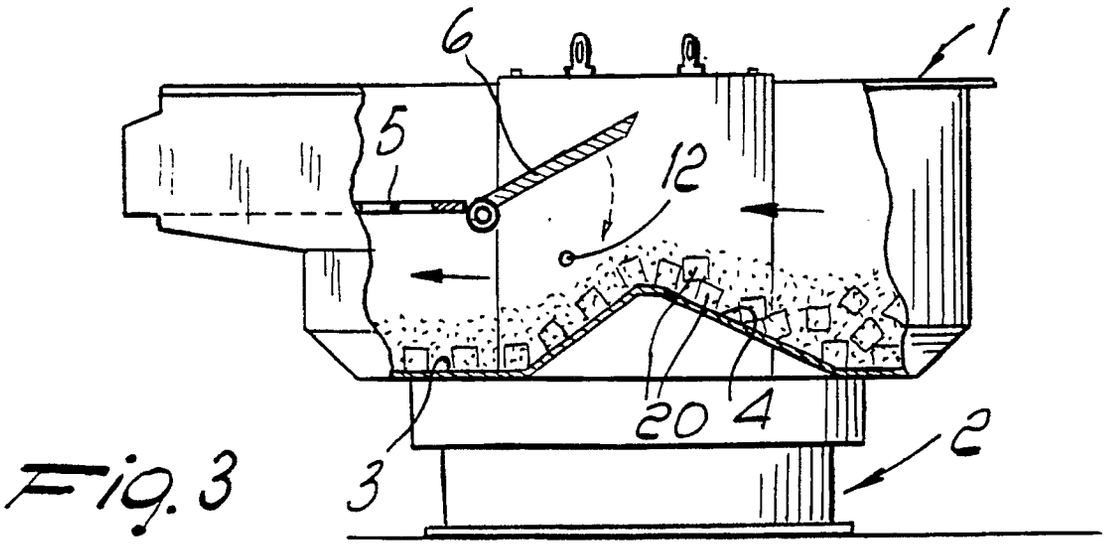

Fig. 3

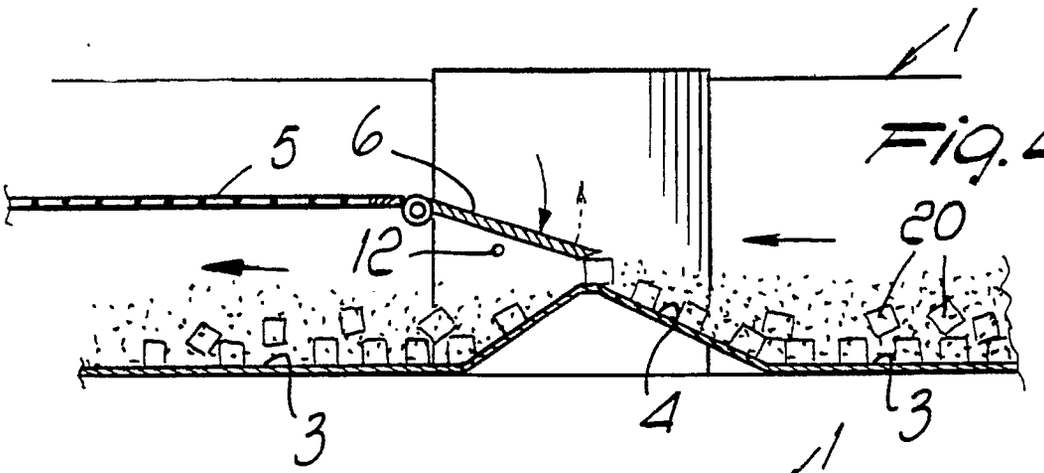

Fig. 4

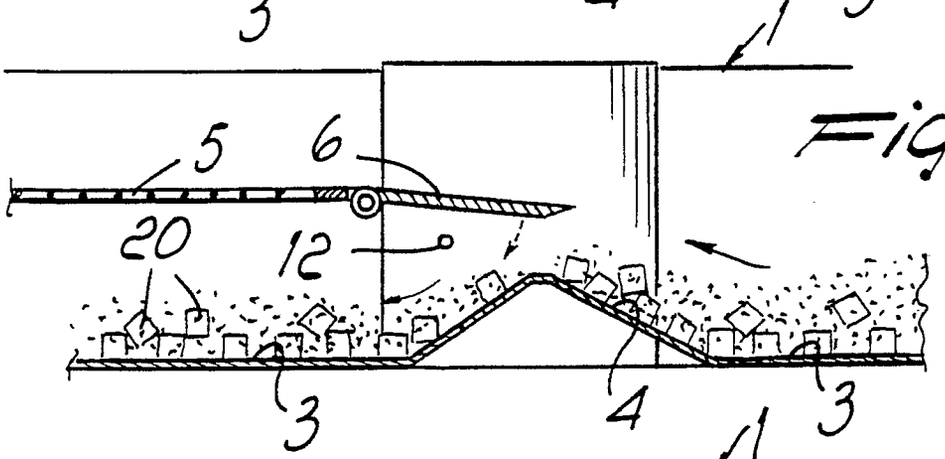

Fig. 5

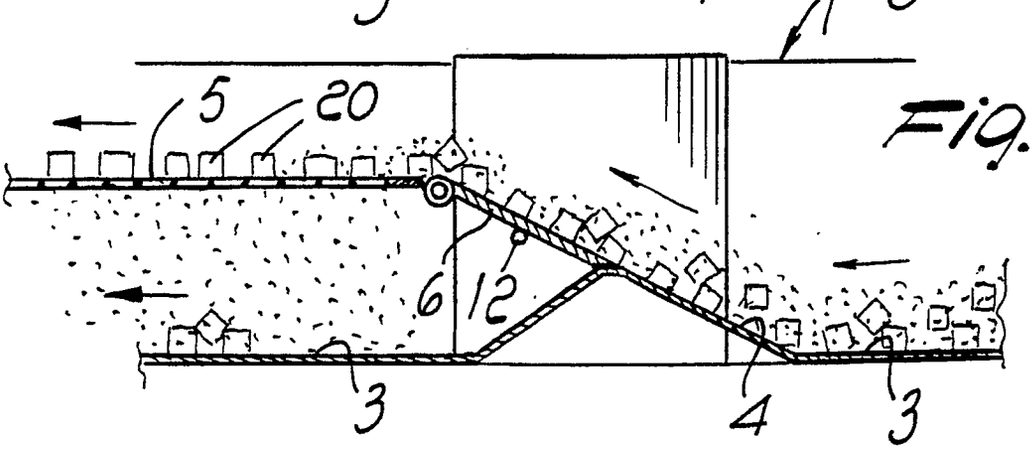

Fig. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 11 0046

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-A-3 703 545 (WALTHER GmbH) * Figure 2; column 1, line 35 - column 2, line 68 *	1,2	B 24 B 31/16
A	EP-A-0 229 297 (WALTHER GmbH) * Abstract; figure 5 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 24 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	05-09-1990	ESCHBACH D.P.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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