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(54) Vibrating machine, particularly for the mass drying of metallic bodies, with automatic unloading of the dried parts.

(57) The present invention relates to a vibrating machine, particularly for the mass drying of metallic bodies, with automatic unloading of the dried parts, which comprises a tank body (1) provided with vibrating means associated with a supporting frame by means of the interposition of anti-vibration means. The tank body (1) is internally provided with a bottom (3) defining a ramp-like portion (4) which leads to a selection plane having an initial fixed portion (11) a central openable portion (13) and a terminal unloading portion (14). The peculiarity of the invention is constituted by the fact that the openable central portion (13) comprises a first wing (20) which is pivoted to the initial fixed portion (11) and a second wing (21) which is pivoted to the terminal unloading portion (14). The wings (20,21) can be rotated to place them in a working position, whereat the first wing (20) is rotated downward for causing material to fall into the tank body (1), and in an unloading position, whereat the first wing (20) and the second wing (21) are mutually aligned for the outward conveyance of dried parts.

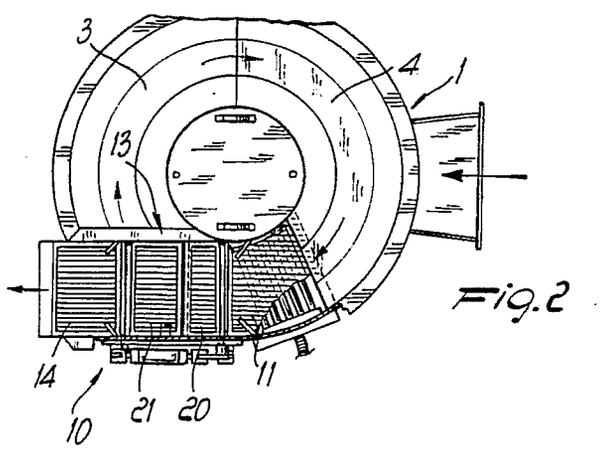

Fig. 2

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VIBRATING MACHINE, PARTICULARLY FOR THE MASS DRYING OF METALLIC BODIES, WITH AUTOMATIC UNLOADING OF THE DRIED PARTS

The present invention relates to a vibrating machine, particularly for the mass drying of metallic bodies, with automatic unloading of the dried parts.

As known, vibrating machines are currently commercially available which are predominantly used for drying metallic parts and comprise a tank body provided with vibrating means and associated with a supporting frame through the interposition of anti-vibration means.

A circular bottom is provided inside the tank body and has a ramp-like portion which conveys the items being processed together with the loose material, which can be constituted by abrasive elements, polishing elements and drying elements, to a selection plane which has an initial fixed portion, which in practice separates the parts being processed from the loose material, and an openable central portion which can be connected to a terminal unloading portion.

In known solutions, the openable central portion is in practice constituted by a grid which is pivoted, at the edge which is contiguous to the terminal portion to be moved, to a raised position which allows the parts being processed to fall inside the tank.

When unloading is to be performed, the central portion or grid is arranged so as to continue the fixed initial portion, consequently conveying the parts outward.

With this arrangement, when the openable central portion is closed, i.e. when it is aligned with the fixed initial portion, the presence of an operator is required to make sure that items being processed do not remain trapped between the edge of the central openable portion and the edge of the fixed initial portion.

With this arrangement it has consequently not been possible to automate the process steps and in particular it has not been possible to automate the unloading start step, due to the requirement of the presence of the operator.

Even the solution of pivoting the openable central part to the fixed initial portion has been found to be not possible, since in normal processes it would be necessary for the openable central portion to be folded downward and in this case, due to its relatively large width in the direction of circulation of the parts being processed, it would cause an obstacle inside the tank, preventing the free circulation of the parts.

The aim of the invention is to solve the above described problem by providing a vibrating machine particularly for the mass drying of metallic bodies which allows the unloading steps to be carried out automatically, since the presence of the operator is not required even in the step of passage from the operative condition with recycling to the unloading condition.

Within the scope of the above described aim, a particular object of the invention is to provide a vibrating machine which allows to move the openable central portion without running the risk in any way of clamping or trapping parts being processed, during the various operative steps of passage from one working condition to another.

Another object of the present invention is to provide a vibrating machine which achieves said automation with extremely simple means which are easy to use.

Not least object of the present invention is to provide a vibrating machine which can be easily obtained starting from commonly commercially available elements and materials and which is furthermore competitive from a merely economical point of view.

The above described aim, the objects mentioned and others which will become apparent hereinafter are achieved by a vibrating machine, particularly for the mass drying of metallic bodies, with automatic unloading of the dried parts, according to the invention, which comprises a tank body provided with vibrating means and associated with a supporting frame by means of the interposition of anti-vibration means, said tank body having, on the inside, a bottom defining a ramp-shaped portion leading to a selection plane having an initial fixed portion, an openable central portion and a terminal unloading portion, characterized in that said openable central portion comprises a first wing pivoted to said initial fixed portion and a second wing hinged to said terminal unloading portion, said wings being rotatable to place them in a working position, whereat said first wing is rotated downward for causing material to fall into said tank body, and in an unloading position, whereat said first wing and said second wing are mutually aligned for outwardly conveying dried parts.

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

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

figure 2 is a top plan view of a vibrating

machine;

figure 3 is a sectional view of a vibrating machine taken along a diametral plane;

figure 4 is a view of the selection plane in working position;

figure 5 is a view of the initial step of passage from the working position to the unloading position;

figure 6 is a view of an intermediate step of the passage from the working position to the unloading position;

figure 7 is a view of the selection plane in the position for unloading the dried parts;

figure 8 is a schematic view of the passage from the unloading position to the working position.

With reference to the above described figures, the vibrating machine, particularly for the mass drying of metallic bodies, with automatic unloading of the dried parts, according to the invention, comprises a tank body generally indicated by the reference numeral 1 which is provided with vibrating means and is associated with a base supporting frame 2 with the interposition of conventional anti-vibration means which are not described herein in detail.

The tank body 1 internally defines a bottom 3 with a substantially circular extension which has a ramp-like portion 4 leading into a selection plane generally indicated by the reference numeral 10.

Said selection plane 10 is provided with an initial portion 11, advantageously of the grid-shaped kind, which is arranged above electric heating resistors 12 which have the function of heating and drying the grit or loose material which is intermixed between the various parts being processed.

An openable central portion, generally indicated by the reference numeral 13, and a terminal unloading portion, indicated by the numeral 14, are provided on the continuation of the fixed initial portion.

The peculiarity of the invention is constituted by the fact that the central openable portion 13 is constituted by a first wing 20 with a grid-shaped configuration, which is pivoted at the edge contiguous to the initial portion 11, is and by a second wing 21 which is in turn pivoted at the edge contiguous to the terminal portion 14.

Advantageously but not necessarily, the first wing has a width, in the direction of passage of the material, which is smaller than the second wing 21.

As illustrated in figures 4 to 8, the wings 20 and 21 are rotatable about their pivoting axis to assume different positions for the passage from the working position to the unloading position and vice versa.

The rotation of the wings 20 and 21 is advantageously performed by means of a first and second cylinder, respectively indicated at 22 and 23, which act on the pivoting pin and perform the rotation.

As illustrated in figure 4, in the working position, i. e., in the position in which the various parts are continuously re-inserted into the tank, the first wing 20 is in a lowered position, i.e., directed towards the bottom of the tank, whereas the second wing 21 is in raised position, i.e., directed upwardly.

In these conditions, the material carried by the vibration onto the selection plane creates a first selection with separation of the grit and loose material which falls onto the electric resistors 12, whereas the various parts being machined, indicated by the reference numeral 15, are re-inserted toward the bottom of the tank.

For the passage from the working position to the unloading position, the first wing is first rotated upward (figure 5), thus creating a temporary barrier for the passage of the parts being processed, which are thus retained.

The second wing 21 is simultaneously rotated downward until it engages a stop abutment 30; the second wing 22 moves to align with the terminal portion 14.

Once the second wing has been positioned, the first wing 20 is rotated downward and becomes arranged in alignment with the second wing, thus defining a continuous selection plane (figure 7) which allows the outward unloading of the parts.

It should be furthermore added that the first wing and the second wing are provided, at the edges of mutual contact, with opposite shaped portions, indicated by the reference numerals 31 and 32, which allow to provide a rabbet-like coupling, with the first wing in practice resting on the edge of the second wing.

Once the parts have been unloaded, the first wing is rotated upward, thus releasing the second wing, which is rotatable upward, whereas the first wing is rotated downward, thus returning to the working conditions illustrated in figure 4.

With the described arrangement it is possible to automate the passage from the working position to the unloading position since it is not possible to trap the parts during the movement of the openable central portion.

It is furthermore possible to rotate the first wing downward, since its width is relatively small and consequently does not hinder the free circulation of the material on the bottom of the tank.

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 the substantial splitting in two of the openable central portion of the selection plane allows to completely automate the operation of the vibrating machine which can be time-controlled, so as to perform the process for a certain presettable time

period and then automatically perform the step of unloading the dried parts without running the risk of trapping the parts during the movement of the openable central portion.

The presence of the related abutment wings provided on the coupling edges of the wings 20 and 21 allows to provide a precise rest position for the first wing on the second wing which ensures the continuity of the selection plane so as to achieve easy unloading of the product toward the outside of the machine.

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 may furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, so long as compatible with the specific use, 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 mass drying of metallic bodies, with automatic unloading of the dried parts, which comprises a tank body provided with vibrating means and associated with a supporting frame by means of the interposition of anti-vibration means, said tank body having, on the inside, a bottom defining a ramp-like portion leading to a selection plane having an initial fixed portion, an openable central portion and a terminal unloading portion, characterized in that said openable central portion comprises a first wing pivoted to said initial fixed portion and a second wing hinged to said terminal unloading portion, said wings being rotatable to place them in a working position, whereat said first wing is rotated downward for causing material to fall into said tank body, and in an unloading position, whereat said first wing and said second wing are mutually aligned for outwardly conveying the dried parts.

2. Vibrating machine, according to the preceding claim, characterized in that said first wing has a width, in the direction of unloading of the dried parts, which is smaller than the width of said second wing.

3. Vibrating machine, according to the preceding claims, characterized in that it comprises a stop abutment which can be engaged by said second wing for positioning it in alignment with said terminal unloading portion.

4. Vibrating machine, according to one or more of the preceding claims, characterized in that it comprises, on the mutually adjacent edges of said first wing and said second wing, abutment wings for at least partially superimposing said first wing on said second wing.

5. Vibrating machine, according to one or more of the preceding claims, characterized in that it comprises cylinders which act on the pivoting axis of said wings to rotate them.

6. Vibrating machine, according to one or more of the preceding claims, characterized in that in order to pass from said working position to said unloading position said first wing is first rotatable upward to provide a barrier for causing temporary stoppage of dried parts, said second wing being then rotatable to arrange it in alignment with said terminal portion, said first wing being subsequently rotatable to arrange itself in alignment with said second wing.

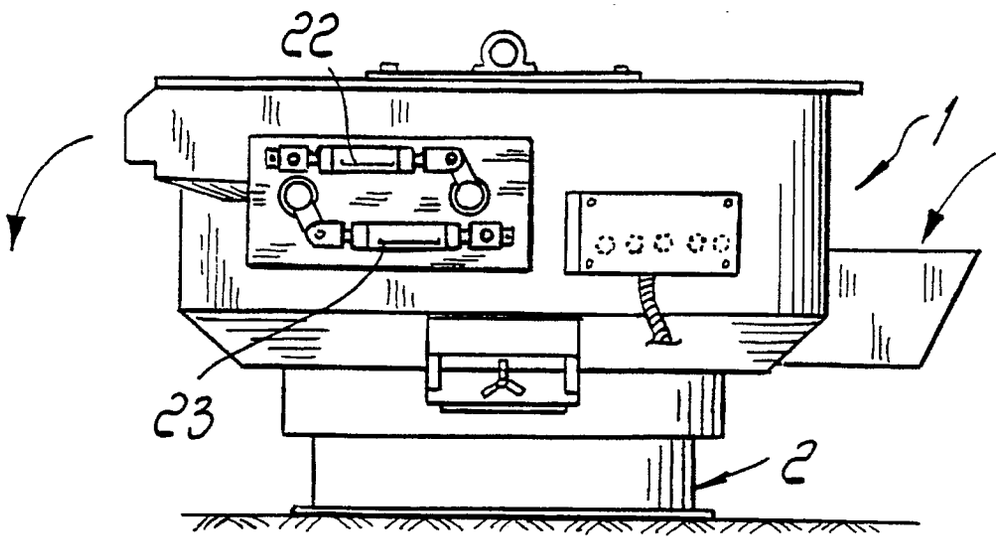

Fig. 1

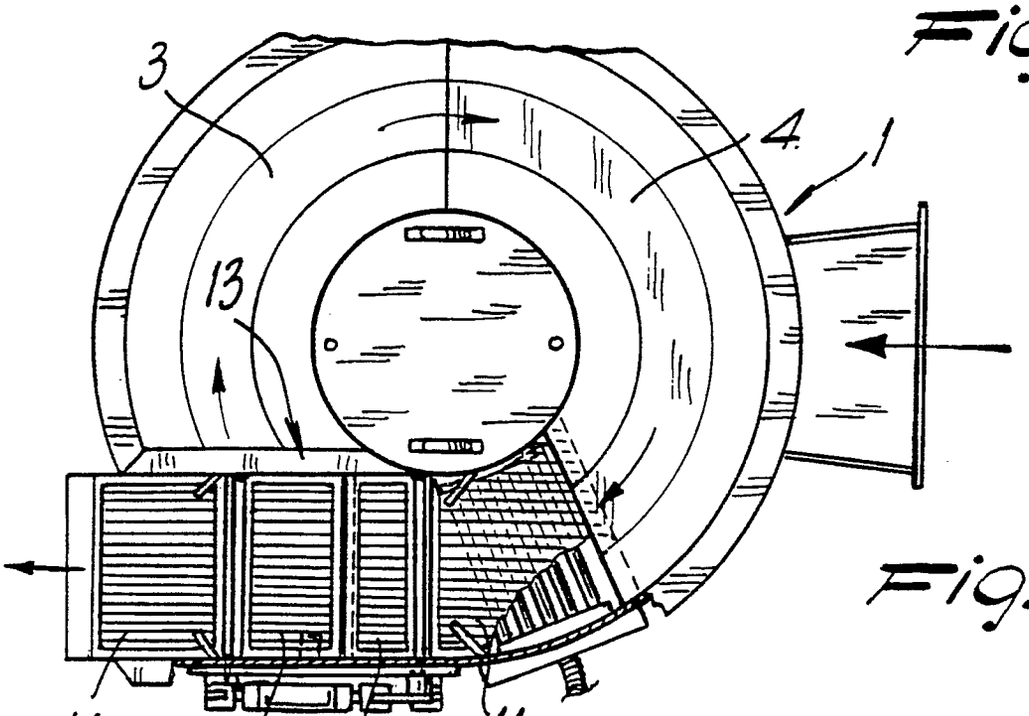

Fig. 2

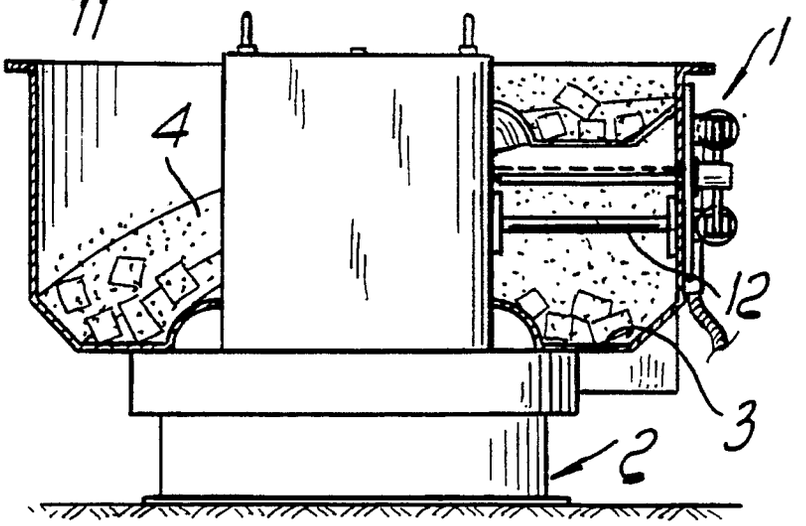

Fig. 3

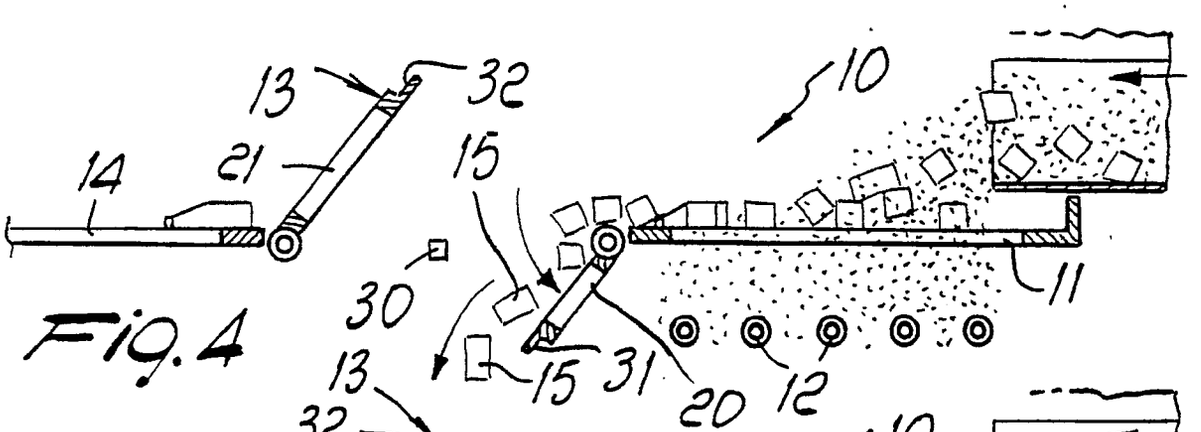

Fig. 4

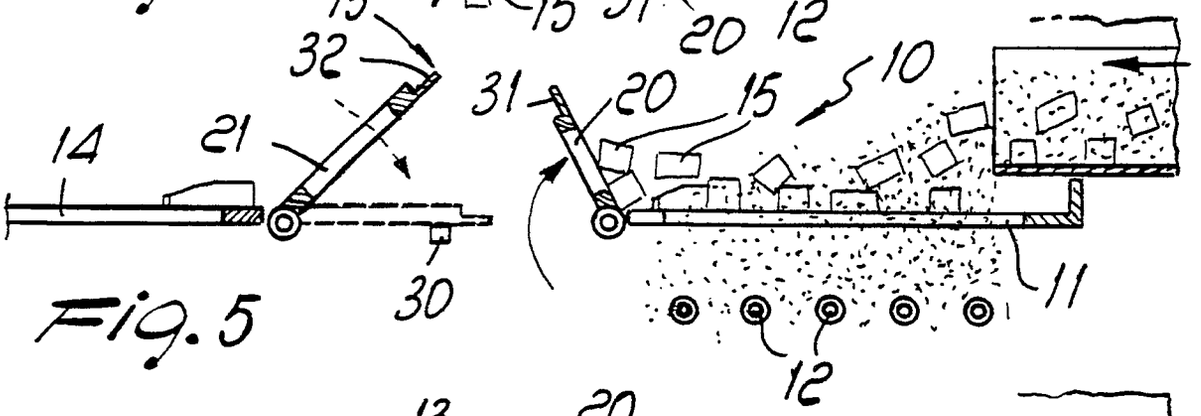

Fig. 5

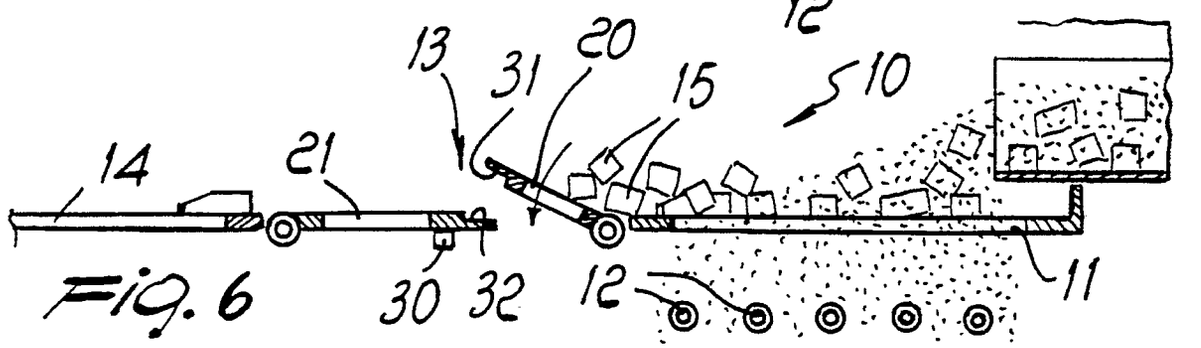

Fig. 6

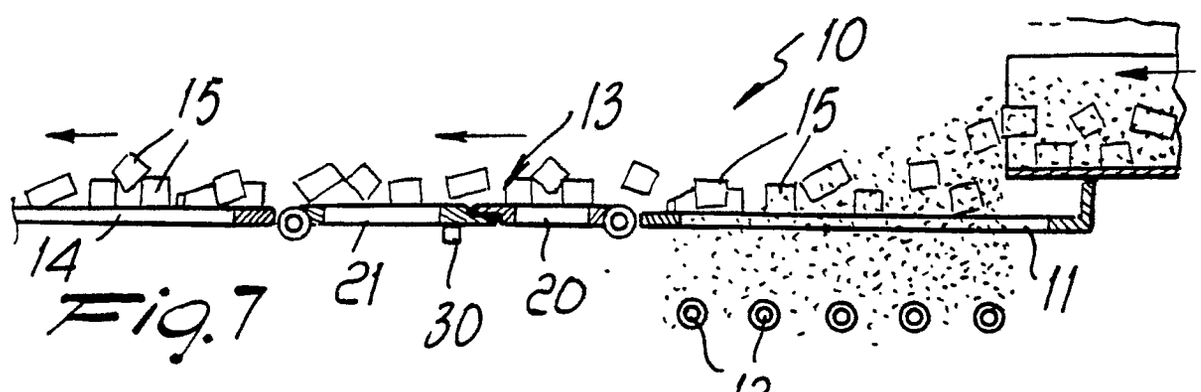

Fig. 7

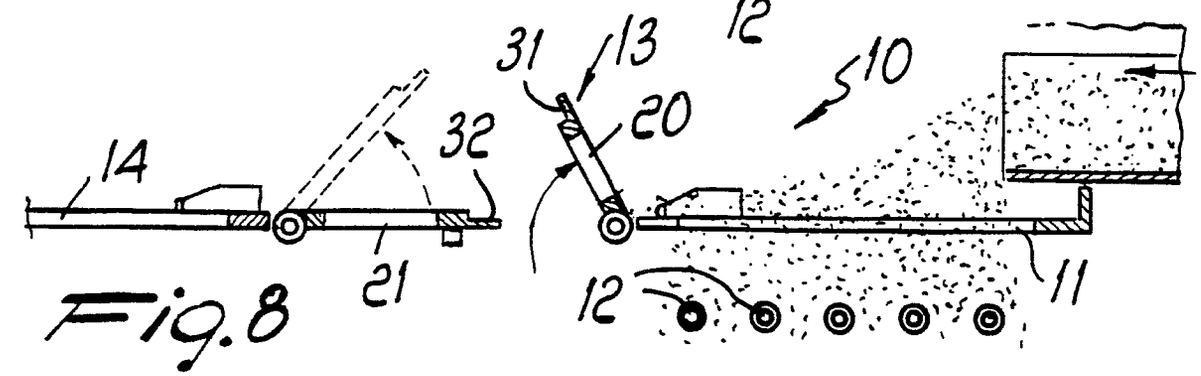

Fig. 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 11 0047

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	EP-A-0 282 937 (RENI-CIRILLO S.r.l.) * Entire document *	1	F 26 B 17/26 B 24 B 31/16
A	DE-U-8 717 565 (ROLAND RÖSLER OBERFLÄCHENTECHNIK KG) * Entire document *	1	
A	EP-A-0 229 297 (CARL KURT WALTHER GmbH & CO. KG) * Entire document *	1	
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A	DE-A-3 703 545 (CARL KURT WALTHER GmbH & CO. KG)		
A	GB-A- 928 121 (RICE GROWERS ASSOCIATION OF CALIFORNIA)		
A	US-A-3 868 213 (SHULIKA et al.)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

F 26 B
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	SILVIS H.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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