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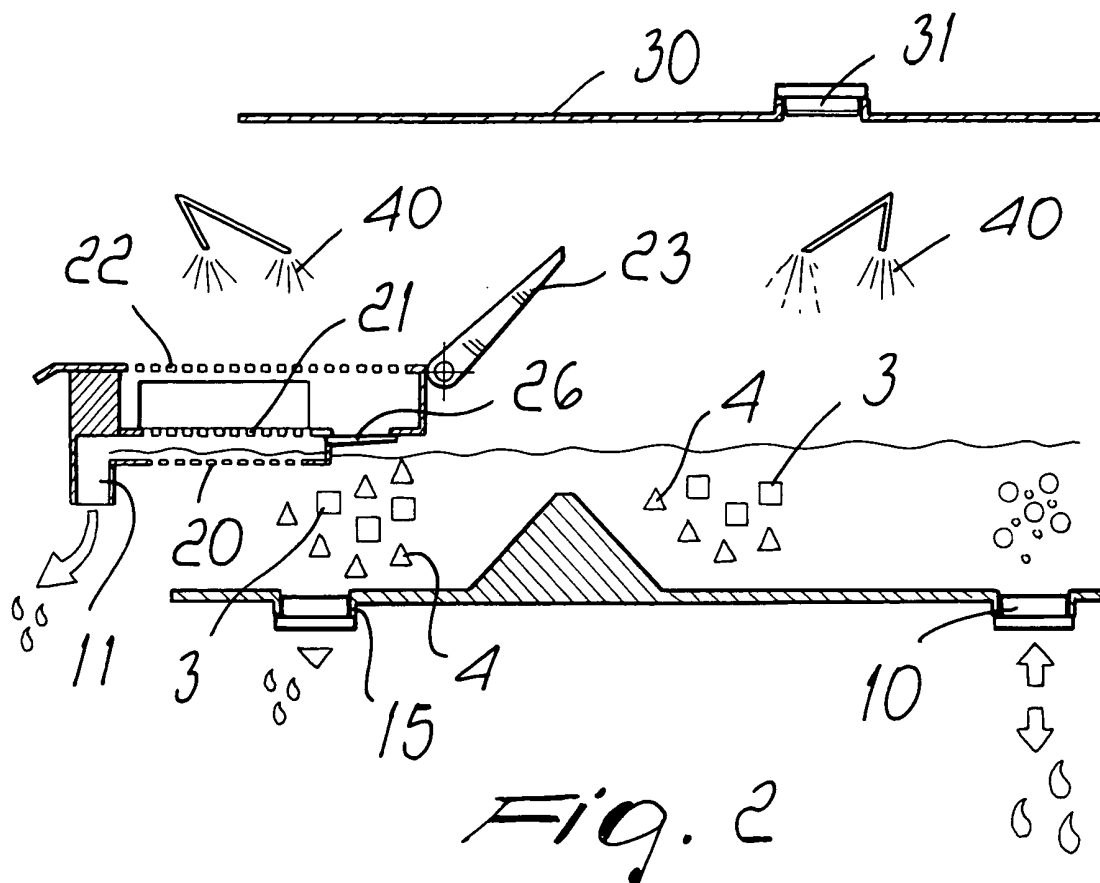
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(54) Circular vibratory finishing machine with improved washing means

(57) The present invention relates to a circular vibratory finishing machine with improved washing means, which comprises a circular tank body for containing the parts to be treated and the finishing media.

The particularity of the invention consists in that it comprises, on the bottom of the tank body, a first inlet for introducing a washing fluid and, at a preset level of said tank body, an overflow opening for the washing fluid.



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Description

[0001] The present invention relates to a circular vibratory finishing machine with improved washing means.

[0002] As is known, circular vibratory finishing machines typically have a circular tank body into which the parts to be treated and the finishing media, which can be of the most disparate types, are introduced.

[0003] In these machines, normally there is a system for introducing working and washing fluids, which often cause treatment problems.

[0004] In particular, according to current methods, there is a gravity discharge filter, through which small particles and the liquid are made to exit from the machine.

[0005] This type of emptying is particularly slow and is subject to frequent clogging due to the small size of the filter.

[0006] In known machines, moreover, there is an optional full discharge opening for discharging also the finishing media to be replaced, but this embodiment then entails a subsequent step of rinsing and drying, which must be performed in another machine.

[0007] The aim of the present invention is to solve the problems noted above by providing a circular vibratory finishing machine with improved washing means that allows to provide optimum rinsing and/or washing of the parts being treated, without running the risk of clogging the filtering elements, with the additional possibility to rapidly discharge the liquid.

[0008] Within the scope of the above aim, a particular object of the invention is to provide a circular machine that allows to perform automatic drying without having to transfer the parts being treated to a separate dryer or to another machine, furthermore allowing to perform the drying step with hot air during the step for discharging the water.

[0009] Another object of the present invention is to provide a circular vibratory finishing machine with improved washing means that thanks to its particular constructive characteristics is capable of giving the greatest assurances of reliability and safety in use.

[0010] Another object of the present invention is to provide a circular vibratory finishing machine with improved washing means that can be obtained easily starting from commonly commercially available elements and materials and is furthermore competitive from a purely economic standpoint.

[0011] This aim, these objects and others that will become better apparent hereinafter are achieved by a circular vibratory finishing machine with improved washing means, according to the invention, which comprises a circular tank body for containing the parts to be treated and the finishing media, characterized in that it comprises, on the bottom of said tank body, a first inlet for introducing a washing fluid and, at a preset level of said tank body, an overflow opening for said washing fluid.

[0012] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of a circular vibratory finishing machine with improved washing means, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a schematic plan view of the circular machine according to the invention;

Figure 2 is a conceptual diagram of the washing means;

Figure 3 is a view of the step for rinsing and/or washing by flotation;

Figure 4 is a schematic view of the circular vibratory finishing machine during the step for discharging the washing fluid and drying;

Figure 5 is a diagram of the operation of a circular machine with automatic separator;

Figure 6 is a view of the initial step of separation of the treated parts;

Figure 7 is a schematic view of the step for selecting the finishing media.

[0013] With reference to the figures, the circular vibratory finishing machine with improved washing means, according to the invention, generally designated by the reference numeral 1, comprises a circular tank body 2, into which the parts to be treated, designated by the reference numeral 3 and shown as squares in the diagrams, and the finishing media 4 are introduced; said finishing media are shown schematically as triangles and can be of different types according to the different treatments to be performed.

[0014] A particular characteristic of the invention is constituted by the fact that on the bottom of the tank body 2 there is first inlet 10, which allows to introduce rinsing and/or washing liquid, from the bottom of the tank, in order to achieve its exit by means of an overflow opening 11 provided at a preset level of the tank.

[0015] With this arrangement, rinsing by flotation with upward circulation of the water or washing fluid from below is provided, thus allowing the passage of water and small floating particles, foam and dissolved impurities, which exit outward. This type of washing is extremely effective, especially for removing light and floating impurities, such as foams.

[0016] By using suitable detergents it is possible to convey, together with the foams, also the impurities, such as for example oily traces, in order to perform efficient and rapid washes.

[0017] Advantageously, it is possible to provide a filtering surface 20, which is arranged below an optional separator and is provided by means of a fine-mesh grille, which accordingly forms a large filtering surface that allows the passage of the floating impurities.

[0018] The filtering surface 20 is arranged advantageously but not necessarily below a separator, which has an intermediate grille 21 located below an upper

separation grille 22, on which the extraction flap 23 places both the treated parts and the finishing media.

[0019] The separation grille 22 conveys outward the treated parts and places the finishing media on the intermediate grille 21, which separates from them the undersized finishing media, designated by the reference numeral 5 in the diagram and shown as triangles.

[0020] Advantageously, the intermediate grille, in its initial portion, can have a flow control flap 26, which is left open in the initial discharge steps, so that a fraction of the finishing media is returned directly into the tank, without passing beforehand over the intermediate grill that separates the undersized finishing media.

[0021] In order to perform the step for separating the undersized finishing media, the flow control flap 26 is arranged in the closed position, as shown in Figure 7, and the undersized elements are evacuated outward through the overflow opening, which allows the exit by flotation of the liquid during the washing step.

[0022] It should be added to the above that at the first inlet 10 it is possible to provide suction means, which can be constituted by a pump that acts by suction instead of by pressure and allow to provide rapid discharge of the tank, thus bypassing the normal gravity discharge filter that is provided at a conventional second inlet, designated by the reference numeral 15 and provided on the bottom of the tank.

[0023] During this step for the evacuation of the water, a forced suction of liquids is produced.

[0024] It should be added to the above that normally there is a cover 30 for closing the tank which is provided in order to reduce the noise of the tank; said cover is provided with an upper connector 31, which allows connection to an optional hot air blower, so as to perform the hot-air drying step directly inside the circular vibratory finishing machine.

[0025] The opening 30 can also be provided to introduce the normal elements used in the process.

[0026] The step for introducing hot air can be performed simultaneously or possibly separately with respect to the liquid aspiration step described earlier.

[0027] After performing washing and any drying, the treated parts can be discharged from the tank by way of a conventional discharge door or, in case of an automatic separator, by way of the separation grille described above.

[0028] From the above description it is thus evident that the invention achieves the proposed aim and objects, and in particular the fact is stressed that a circular vibratory finishing machine is provided in which the conventional criteria of washing are subverted, said criteria consisting solely in the presence of upper sprinklers, designated by the reference numeral 40, which are also present in the circular machine described above, but simply as sprayer elements, without altering the fact that washing is performed by introducing a washing fluid from the lower part of the tank, so as to affect as a whole the internal mass, obtaining a definitely improved effect

with respect to the conventional art.

[0029] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

[0030] All the details may further be replaced with other technically equivalent elements.

[0031] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements.

[0032] The disclosures in Italian Patent Application No. MI2002A000827 from which this application claims priority are incorporated herein by reference.

[0033] 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 interpretation of each element identified by way of example by such reference signs.

Claims

1. A circular vibratory finishing machine with improved washing means, comprising a circular tank body for containing the parts to be treated and the finishing media, **characterized in that** it comprises, on the bottom of said tank body, a first inlet for introducing a washing fluid and, at a preset level of said tank body, an overflow opening for said washing fluid.
2. The machine according to claim 1, **characterized in that** the inflow of water from said first inlet and the outflow by way of an overflow opening provide a flotation of the impurities that are present in said tank.
3. The machine according to one or more of the preceding claims, **characterized in that** it comprises a filtering surface at said overflow opening.
4. The machine according to one or more of the preceding claims, **characterized in that** it comprises, at said first inlet, suction means for the outflow of said washing fluid.
5. The machine according to one or more of the preceding claims, **characterized in that** it comprises a second inlet provided with a discharge filter for the exit of the liquid by gravity.
6. The machine according to one or more of the preceding claims, **characterized in that** it comprises a cover for closing said tank body which is provided with an upper connector.
7. The machine according to one or more of the preceding claims, **characterized in that** it comprises,

at said upper connector, means for blowing air into said tank body.

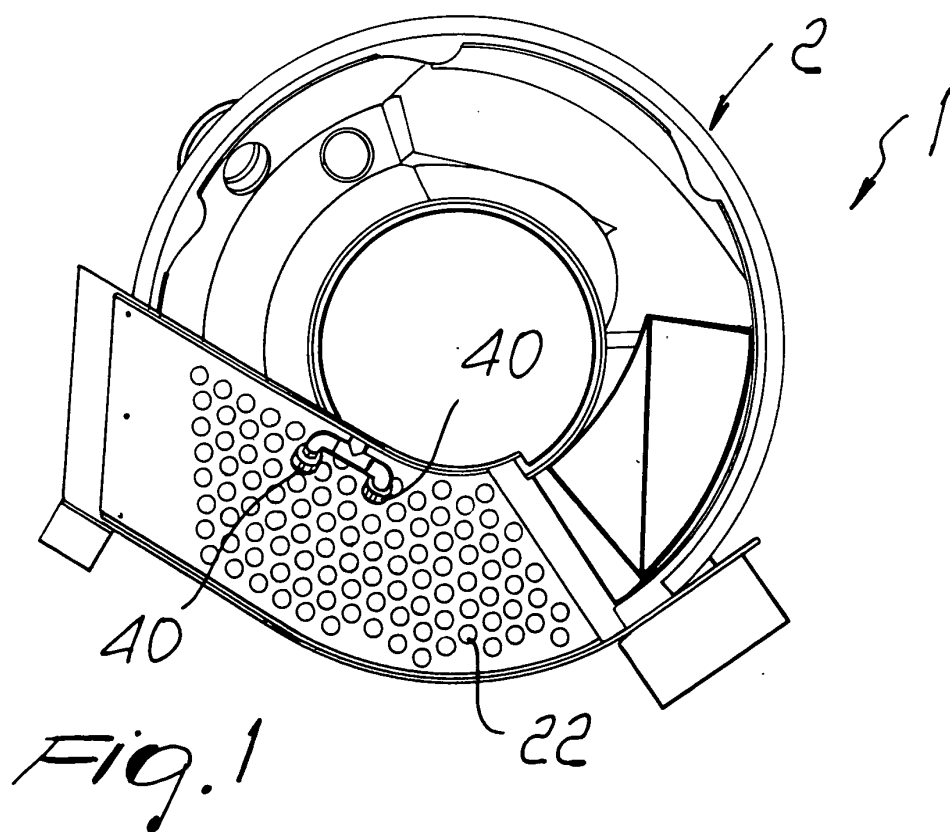
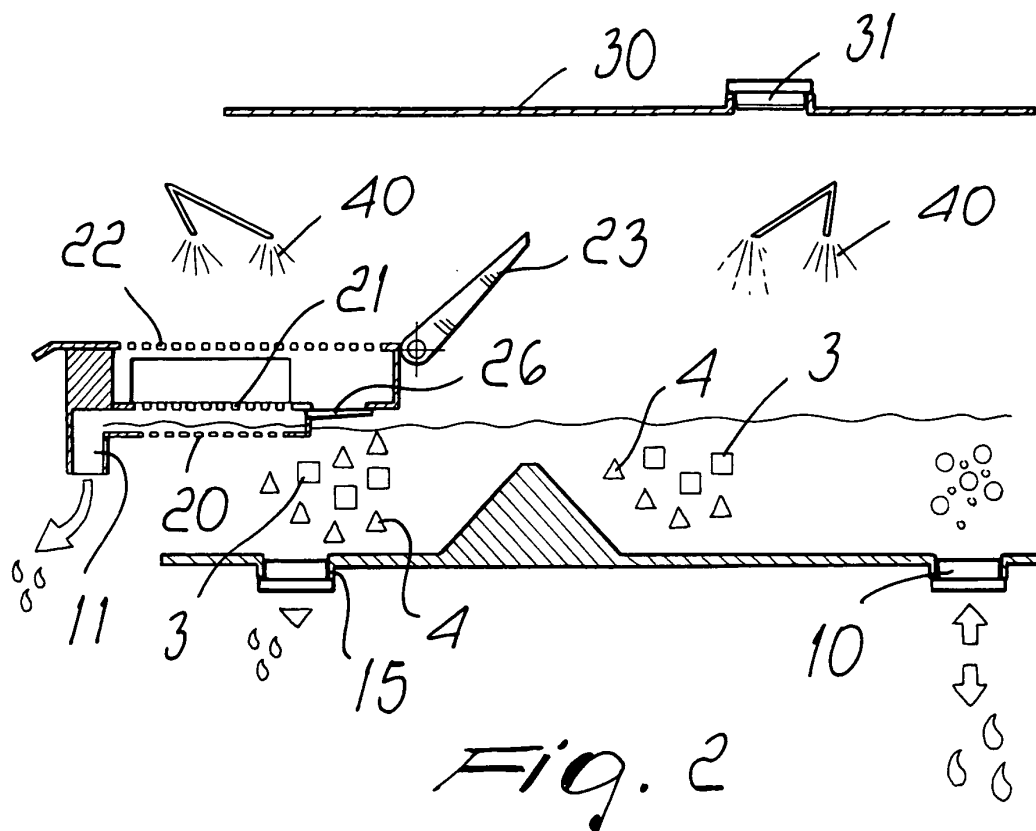
8. The machine according to one or more of the preceding claims, **characterized in that** it comprises, at said upper connector, means for blowing hot air in said tank body. 5
9. The machine according to one or more of the preceding claims, **characterized in that** it comprises, at the upper part of said tank, upper sprinklers for introducing liquid. 10
10. The machine according to one or more of the preceding claims, **characterized in that** it comprises, at said filtering surface, a separator for separating the parts to be treated from the finishing media. 15
11. The machine according to one or more of the preceding claims, **characterized in that** said separator comprises an intermediate grille, which is located below an upper separation grille, said filtering surface forming a lower surface for evacuating the undersized finishing media. 20
12. The machine according to one or more of the preceding claims, **characterized in that** it comprises, at the initial portion of said intermediate grille, a flow control flap which can be arranged in the open position, in which it introduces a fraction of the finishing media separated by said upper separation grille into said tank body, and in a closed position, in which all of said finishing media are conveyed onto said intermediate grille for the subsequent discharge of the reusable finishing media into said tank body. 25 30 35

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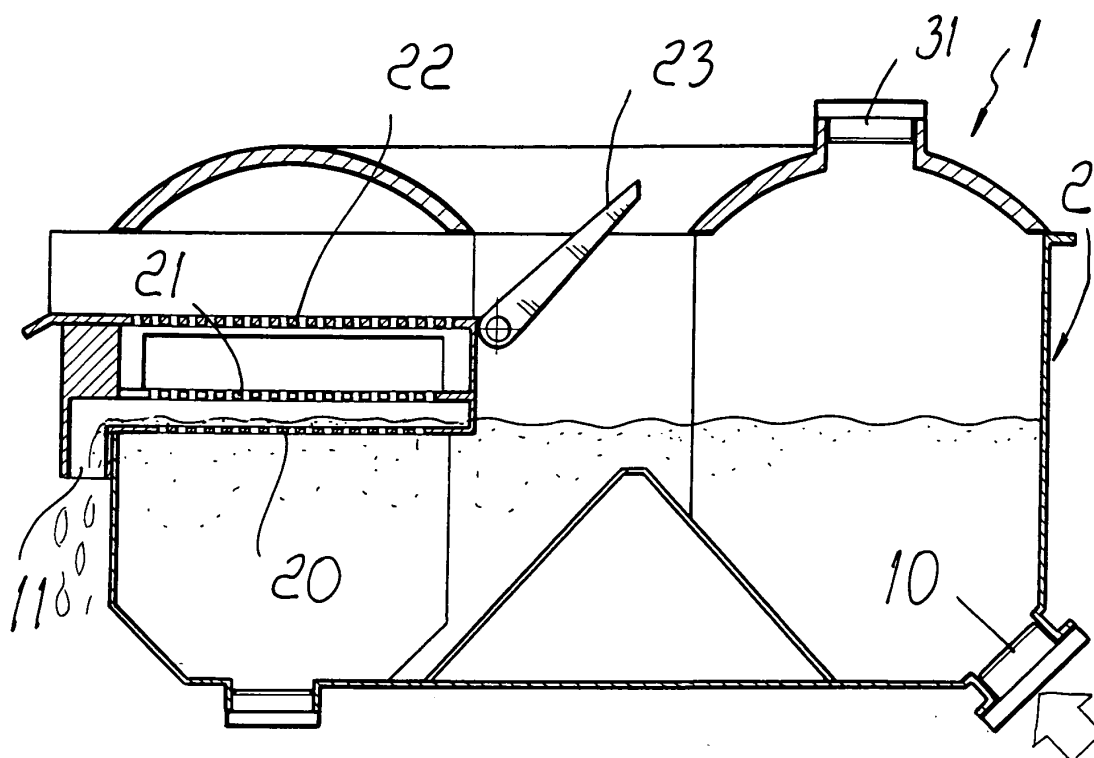


Fig. 3

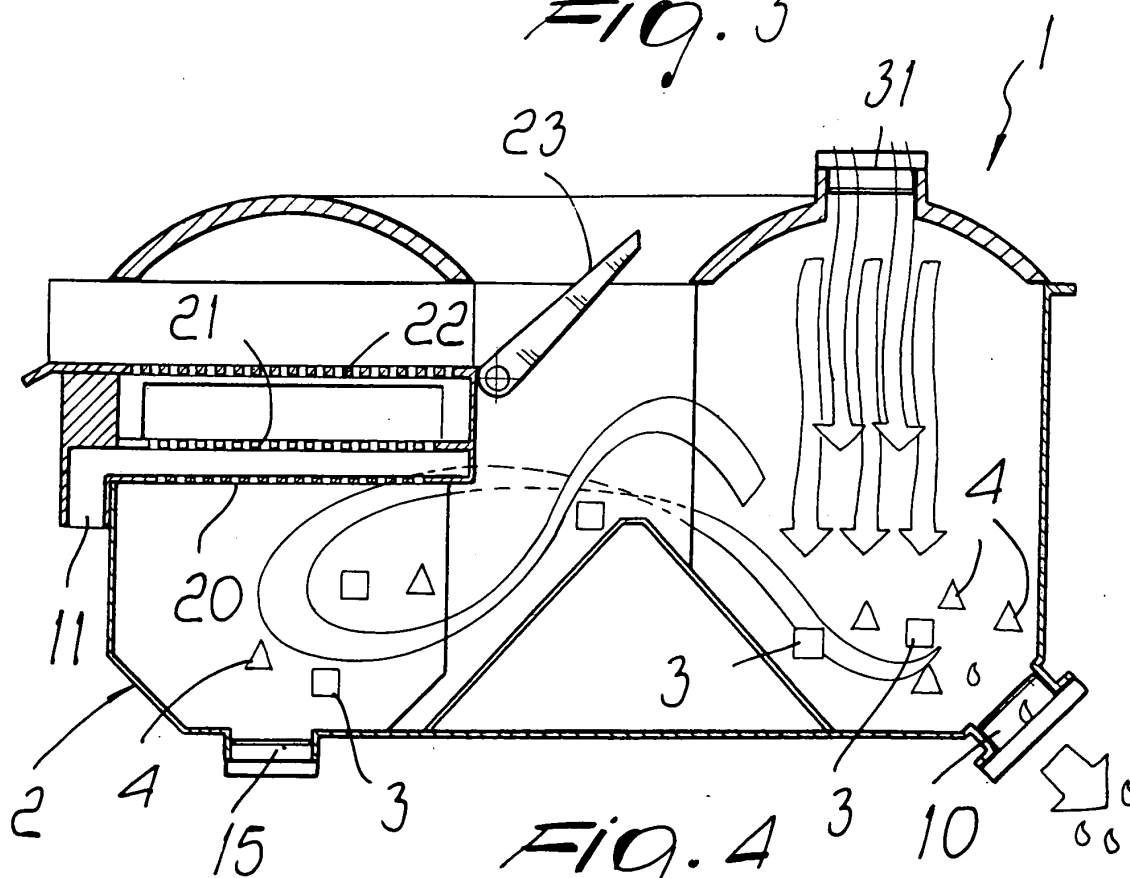


Fig. 4

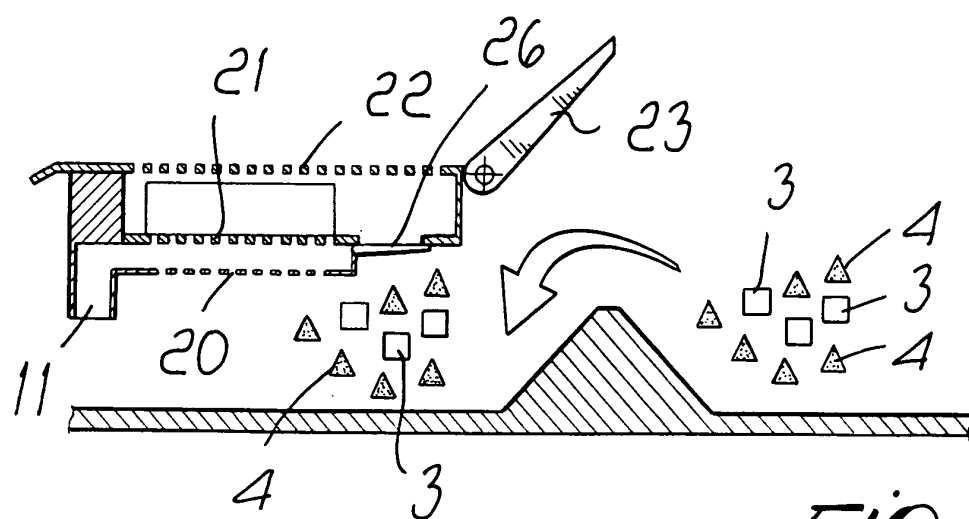


Fig. 5

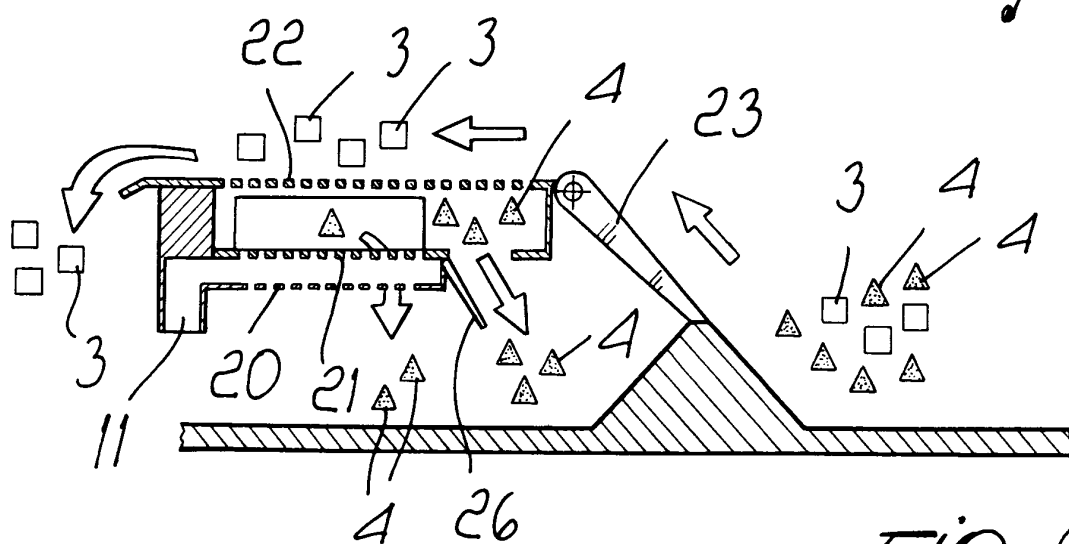


Fig. 6

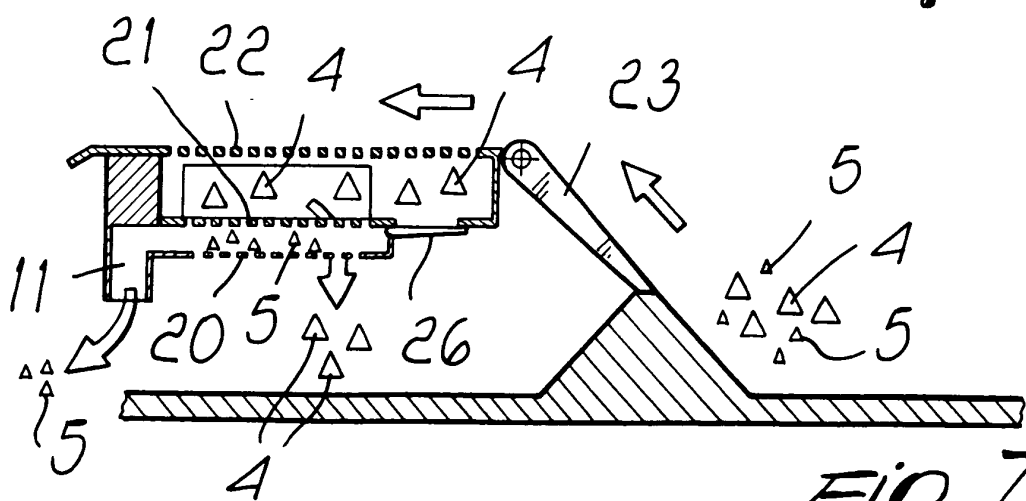


Fig. 7