



## Description

**[0001]** The present finding regards construction improvements on milling, dyeing and retanning drums.

**[0002]** The milling, dyeing and retanning drums, i.e. the machines adapted to render soft, dye and retan the hides, are well known in the tanning industry.

**[0003]** The plant which feeds every drum is essentially composed of three circuits: the air circuit, the chemical products circuit and the water circuit.

**[0004]** The air circuit is of closed type, i.e. with recirculation of the fluid, and it is made to circulate inside the drum through the air chambers equipped with orifices present on the inner walls of the same.

**[0005]** The chemical products and the water are inserted inside the drum, in atomised form, by means of the sprayer nozzles arranged on one or both sides of the drum and, normally, corresponding with the horizontal rotation axis of the drum itself.

**[0006]** The input of the water in atomised form inside the drum has the function of regulating the relative humidity level of the air which circulates inside the drum itself, so that such value is always maintained at the optimal levels required for the machine's correct functioning.

**[0007]** The flow rate of the water to send to the atomiser nozzle is regulated by means of a "humidification group", which is composed of a water filter, a pressure reducer, a normally-open three-way valve and a normally-closed three-way valve.

**[0008]** A first drawback of such drums consists of a possible poor functioning of the sprayer nozzle, fed with the water drawn by the plant's water network or by suitable storage tanks.

**[0009]** Such anomaly is very serious, since it is not detectable during the working, but is only at the end of the "drumming" operation, when the hide discharge window is opened; the hides, if the aforementioned malfunctioning was confirmed, result considerably damaged, such to constitute discard material, with considerable negative consequences on the machine's productivity and consequent economical damage for the user.

**[0010]** A second drawback derives from a possible malfunctioning or breaking of one of the two three-way valves, so that the water flow is no longer correctly regulated, thus generating a blow-by or a dripping, with the result that the same must undergo prolonged drying treatments so that it may be brought back to correct humidity values.

**[0011]** A third drawback derives from the fact that the sprayer nozzle must be positioned in line with the inner wall of the drum, so that the hides which move in proximity to the nozzle spout are hit with a very concentrated and intense atomised jet, which causes narrow, very wet zones in the hide itself which, at the end of the operation, result as "halos", which aesthetically compromise the quality of the product, to the point of sometimes rendering it unusable.

**[0012]** Object of the present finding is that of realising a milling, dyeing and retanning drum in which it is possible to regulate and maintain the relative humidity level of the air which circulates inside the drum contained within a range of optimal values, by still utilising water as regulator element but without the drawbacks present in the realisations of known type.

**[0013]** Such object is achieved by foreseeing that the humidity inside the drum is obtained, rather than by means of a sprayer nozzle which sends atomised water inside the drum which then mixes with the air, by instead inserting previously humidified air inside the drum.

**[0014]** Structurally, in the air recirculation circuit outside the drum, a water humidifier is inserted, through which the air flow is sent before it enters in the drum.

**[0015]** In such a manner, the air is thus inserted within the drum with the correct humidity level and, advantageously, the spraying nozzles present along the drum walls are eliminated, which through the atomised water spray cones could have caused a non-uniform treatment of the hides.

**[0016]** With such structural solution, installing the humidifier device in series with the air treatment group and specifically after the three-way valve, which regulates the air recirculation/replacement, it is possible to indiscriminately realise both the humidification of the recirculation air and that of the replacement air.

**[0017]** The finding will be better defined through the operative scheme illustrated in fig. 1, which represents an operation display of a feeding plant of a milling, dyeing or retanning drum.

**[0018]** As is visible in fig. 1, two circuits converge on the drum 1 according to the finding, and not three as in normal realisations.

**[0019]** In fact the drum 1 is affected by a first circuit 2 for the feeding of the chemical products, where a pump 3 sends, under pressure, the product which is atomised inside the sprayer nozzles 4, all this being in itself known.

**[0020]** The drum 1 is further affected by a second circuit 5, the air circulation circuit, of the closed recirculation type, along the direction of the arrows 6 and which comprises, arranged in series, a dust remover 7, a ventilator 8, a three-way valve 9 and a heating battery 10.

**[0021]** Such circuit is characterised in that it foresees, arranged in series with the other components, a water humidification group 11.

**[0022]** With the insertion of such humidification group 11, the recirculation air is hence previously humidified, so that the first advantage obtained is due to the fact that the air enters in the drum and expands inside the same with the correct relative humidity level, without the need to employ water sprayer nozzles.

**[0023]** A further advantage derives from the fact that the air, with the right humidity level, penetrates within the drum through the holed wall 12 of the diffuser, which being quite extended thus permits a regular and homogeneous diffusion over the entire internal volume of the drum itself.

**[0024]** The use of humidification groups and other components of different type from that described is of course possible, without leaving the scope of the following claims.

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## Claims

1. MILLING, DYEING AND RETANNING DRUM, **characterised in that** inside the drum humidified air is diffused, in order to regulate and maintain optimal humidity values present within the drum itself. 10
2. MILLING, DYEING AND RETANNING DRUM, according to claim 1, **characterised in that** the humidity value of the air sent inside the drum is regulated by means of a humidification group placed outside the drum itself. 15
3. DRUM, according to claim 2, **characterised in that** outside the drum, in the air recirculation circuit, a water humidifier is inserted. 20
4. DRUM, according to claim 3, **characterised in that** the humidifier is placed in series with the suction and treatment group of the recirculation air. 25
5. DRUM, according to one or more of the previous claims, **characterised in that** the humidification group is crossed by the recirculation air flow and/or by the replacement air flow. 30

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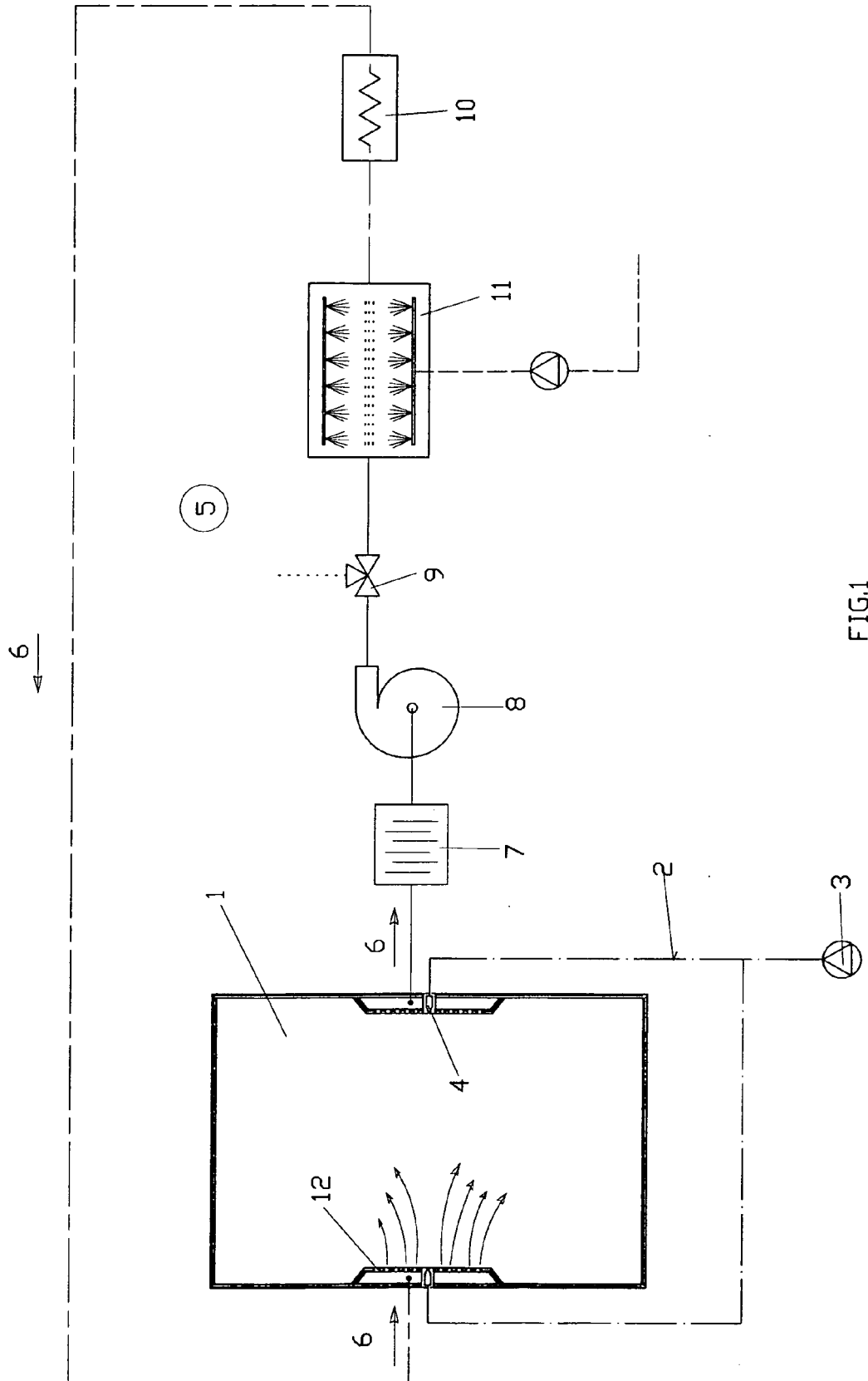


FIG.1