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(54) **Drum with improved structure for processing leather or similars**

(57) In a drum (10) for processing leather or similar, a partial or total covering of the metallic cylindrical surface (11) is provided, by means of pressed sheet metal (19), and in particular embossed sheet metal, fixed to said surface (11) by welding executed both along the perimeter and in internal points of the sheet metal. The

interstice that takes shape between the cylindrical surface (11) of the drum and the covering sheet metal (19) has a small volume, useful to allow the speeding up of the heating and cooling phases of the drum. A structural enforcement of the cylindrical surface of the drum and a simplification in the creating of the interstice are also obtained through the above covering.

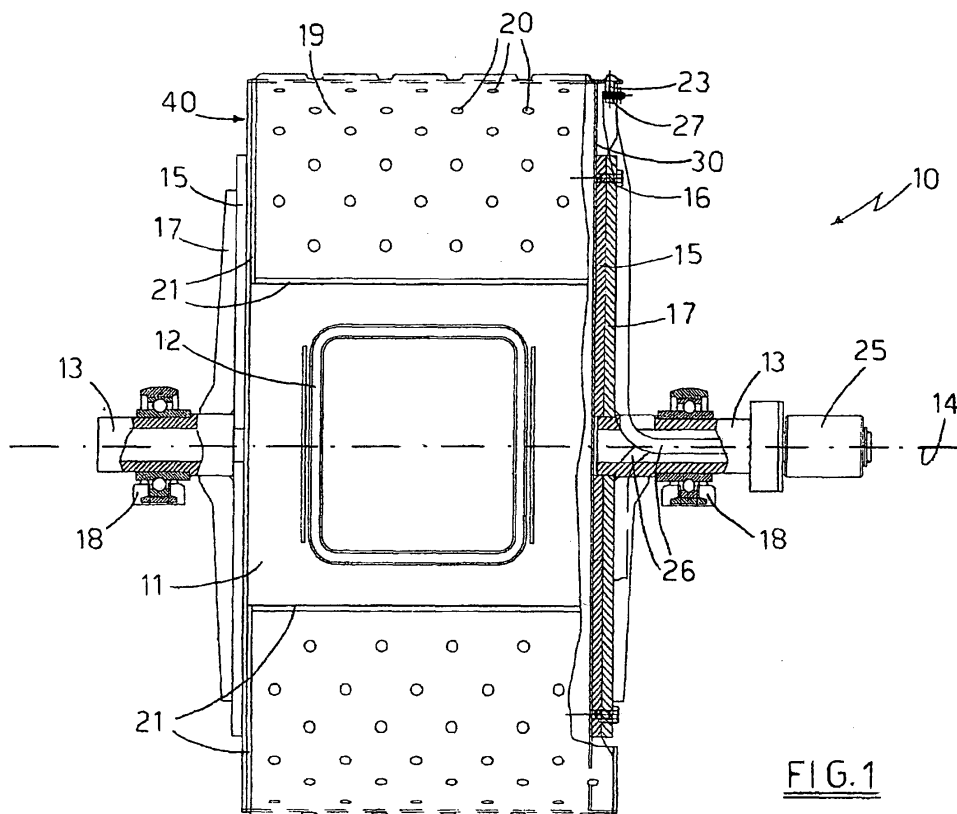


FIG.1

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Description

- Technical field

[0001] This invention relates to a drum for processing leather or similars, and, in particular, to a metallic drum with improved structure.

- Prior art information

[0002] Drums used for processing leather can be realized, as known, of different materials and they can have different dimensions as a function of the usage destination.

[0003] Most operations on the leather provide, for example, plunging the leather in chemical baths or in liquid solutions at predefined temperature, and in this cases the heating of the bath, sheets of leather and the whole drum takes place according to different techniques, such as techniques in which heat exchangers are used which can be internally or externally placed on the drum, or techniques based on direct injection of steam or hot water in the drum, or more.

[0004] In particular, a technique used for heating small metallic testing drums, mainly used in labs, consists of creating an interstice in the cylindrical surface of the cast to allow the circulation of a fluid which can be both a heating fluid and a cooling fluid because in this kind of drums frequent and rapid changes of the bath temperature are needed.

[0005] The above said interstice is obtained with the help of two different concentric cylindrical surfaces that are kept separated of a specific amount by means of separating and supporting elements. The structure that results is quite complicated and heavy and, obviously, this affect the drum's production costs. Moreover, the drum's interstice obtained using the above said method has a relevant thickness and volume so that also the total amount of fluid required for heating or cooling the bath is high. The result is a high energy consumption and a high thermal inertia of the circuit, which decreases the operativeness of said drums.

[0006] It is also to note that, in the drums with interstice now manufactured the conveying of the heating or cooling fluid inside the interstice is not optimized so that it slows down the operations in which the temperature has to be changed.

- Summary of the Invention

[0007] It is the primary object of the present invention to provide a drum with an interstice-type heating/cooling circuit, which is able to troubleshoot the above said matters.

[0008] Further object is to propose a metallic drum with improved structure as regards his resistance and in order to realize an interstice-type heating/cooling system economically advantageous both for its easy-mak-

ing and for its functionality.

[0009] Such objects are obtained through a drum for processing leather in which the main cylindrical body, made of metallic material, is covered, partially or totally, with pressed sheet metal, and in particular, embossed sheet metal. The covering is fixed to the external surface of the cylindrical body by welding both along the perimeter of the pressed sheet metal and on several internal points of said sheet metal.

[0010] Between the surface of said cylindrical body and the covering pressed sheet a low thickness interstice is formed, in which a heating/cooling fluid moves along, spreading uniformly.

[0011] The advantages of the present drum are manifest, first of all relating to the global structural improvement and to the strong effectiveness of the realized heating / cooling system.

[0012] In particular the drum of the invention gets over the limitations relating to the low operative flexibility of the interstice drums of the art thanks to the small volume of fluid used in the heating / cooling circuit.

[0013] Further important advantages of the drum of the invention relate to its easy making, both as regards the making of the interstices, directly coming from the embossed shape of the sheet metal, and for the easiness of providing portions of the surface without covering, for instance as regards the hatch for introduction and removal of skins, or as regards other apertures.

[0014] The embossed shape of the covering, which is useful to sprade the flux, assures a better distribution of the conditioning fluid all along the interstice and, then, a better distribution of the heat and consequently the speeding up of heating and cooling phases.

[0015] It is also to note that the structural enforcement coming from coupling the main surface with the covering surface is obtained without a relevant improvement of the total weight of the drum.

[0016] Finally the drum of the invention keeps all the advantages of the drums with interstice-type heating system such as no danger of contamination or dilution of the chemical bath, no structural complexity due to the adoption of internal or external heat exchanger, or more advantages known by the experts in that field.

- Brief Description of the Drawings

[0017] Anyway, for a better understanding of the characteristics and the advantages of the drum of present invention, this will now be described by way of examples with reference to the accompanying drawings, in which:

- Figure 1 shows a schematic view, in partial section, of a drum of the invention;
- Figure 2 shows a front view of the main body of the drum of fig. 1;
- Figure 3 shows a side view of the main body of fig.2;
- Figure 4 shows a section of a part of the drum of the invention;

- Description of Preferred Embodiments

[0018] Referring to fig. 1, it is indicated with 10 a drum for processing leather according to the present invention.

[0019] It comprises a main cylindrical body, 11, made of metallic material, providing a hatch, 12, for introducing and removing the leather, whose end surfaces, 30, 40, are connected to supporting hollow shafts, 13, rotating together with the cylindrical body, 11, around an horizontal axle, 14.

[0020] Exactly said end surfaces are connected to said hollow shafts by means of strengthening spoked frames, 15, integral to said surfaces, and bolted, through bolts, 16, to further spokelike frames, 17, integral to the rotating hollow shafts, 13. These last are restrained to a fixed structure, not shown in figure, through supporting elements, 18, apt to allow rotation of said shafts with respect to said fixed structure.

[0021] The lateral surface of the cylindrical body, 11, is externally covered with a sheet metal, 19, having, in this case, as we can see in figure 3, several series of embossed cavities, 20, arranged irregularly one with respect to another. Said sheet metal is welded to the cylindrical body, 11, by means of welding spots executed in correspondence to certain embossed cavities, 20. The covering is fastened also by seam welding, 21, executed in correspondence to the peripheral sections of the sheet metal, 19.

[0022] In the present embodiment of the invention, the covering surface covers just the lateral surface of the drum according to an angle of about 300 degrees; it is not provided on the hatch, 12, and around it.

[0023] As shown in figure 4, between the external surface of the cylindrical body, 11, and the covering sheet metal, 19, a low thickness interstice, 22, is formed; it is isolated from the outside thanks to the seam welding, 21.

[0024] Internally to said interstice, 22, a conditioning fluid, useful to heat or cool the chemical bath, flows from an inlet mouth, 23, to an outlet mouth, 24, placed near the extreme zones of the angular extent of the covering.

[0025] The charge and discharge of said fluid come thanks to a rotating hydraulic collector, 25, mounted at one end of the shaft, 133. Said collector 25, which is in the state of the art, is connected to an external set for heating and cooling the fluid. Two pipes, 26, are jointed to the collector; said pipes run inside the hollow shaft, 13, and along one of the bottom surfaces of the drum until the mouths, 23 and 24, where they are fastened by means of bands, 27.

[0026] Said pipes 26 are placed internally in the revolving shafts, 13 but it remains enough free space for a fluid to circulate in the shaft, 13. In fact, especially in drums of relevant size, it is useful to keep free the two entrances of the cylindrical body, 11, in correspondence to the axle, to let the chemical bath to enter or leave the drum.

[0027] The heating or cooling of the drum takes place as a result of the introduction, from the mouth, 23, of the fluid, which spreads in the interstice, 22, raising or lowering the temperature of the surface of the cylindrical body, 11; then through the outlet mouth, 24, the fluid is conveyed towards the outside. The above said process, thanks to the low thickness of the interstice 20 and thanks to the presence of the embossed cavities, 20, requires a small volume of fluid, so that this volume can be heated and cooled very rapidly.

[0028] Moreover, while in drums with interstice type heating system of the known art the fluid runs from the inlet mouth to the outlet mouth along the shortest path, not reaching with effectiveness all the zones of the interstice, in the drum of the invention, thanks to the low thickness interstice and, most of all, thanks to the embossed cavities, 20, which divert the flux of the fluid, this last, when run from the inlet mouth, 23, before coming to the outlet mouth, 24, spreads wide along the whole surface of the cylindrical body, 11, so granting the homogeneous heating or cooling of the drum and the internal bath.

[0029] Therefore, by the extension of the covering surface as above described, as an example, it is obtained a surface covered by the thermal flux which is enough to assure a good regularity of temperature of the drum, but, at the same time, it leaves enough free work space around the zone where the hatch, 12 for loading the leather is provided.

[0030] Nevertheless it is very easy to provide zones covered by means of the embossed sheet metal, 19, different from what above described, less or more extended according to specific requirements and according to the presence of different apertures on the surface of the drum.

[0031] In fact, the embossed sheet metal, 19, can be cut in every needed shape and size, corresponding to the planar development of the portions of surface of the cylindrical body, 11, where circulation of the heating / cooling fluid is required.

[0032] In the case, for example, that the hatch, 12, and its fastening and moving accessories occupy a greater portion of the lateral surface, it can be provided an embossed sheet metal of the same rectangular shape but having a smaller size, so that it covers a smaller angular dimension than the one shown in figure 2. One more different embodiment may provide a 360° covering, shaping the sheet metal, 19, in such a way to obtain uncovered portions in correspondence to the hatch, 12, and the other fastening and moving accessories. In practice, the surface of the cylindrical body, 11, which can be covered is free to be decided as a function of the apertures that have to be provided and as a function of the surface reached by the conditioning fluid needed to assure a proper heating and cooling, obviously comprising the bottom surfaces, 30, 40.

[0033] The high versatility in choosing the extension of the drum surface reached by the conditioning fluid is

allowed by the easiness of assembling the covering thanks to the fact that it is realized with embossed sheet metal, 19. In fact it does not need specific frames that work both as supporting elements for the covering and as spacers between the two surfaces to obtain the interstice, since the embossed cavities, 22, act themselves as supporting elements for the surface and, at the same time, create the interstice, 22. So, it is enough to provide spot welding in certain embossed cavities, 20, to fasten the covering to the cylindrical body, 11, and to provide seam welding, 21, along all the perimetric zones of the sheet metal, 19, so that they fix the covering and, most of all, they assure the sealing of the hydraulic circuit.

[0034] The number of embossed cavities, 20, to be welded to the cylindrical body, 11, can be freely decided in order to obtain appropriate fixing of the covering.

[0035] Obviously also the number and type of inlet and outlet mouths may vary as a function of the shape and displacement of the interstice for circulation of the conditioning fluid.

[0036] Surely, different kinds of pressed sheet metal can be used to realize a covering which has structural enforcement and is able to create the interstice, according to what above disclosed.

[0037] Other changements regarding the drum can be provided, for example, in case of small testing drums which are lightly weighted; in these cases, the cylindrical body, 11, can be jointed to just one revolving shaft, 13, provided with one or more elements, 18, supporting the hydraulic collector, 25, and the motion transmission elements.

[0038] Obviously the drums of the present invention may be used for processing leather, fabric, or similars.

[0039] The above and other changements can be provided in the sphere of protection of the following claims.

Claims

1. Drum (10) for processing leather, or similar, in which the main cylindrical body (11), made of metallic material, is supported by a hollow shaft (13) revolving around an horizontal axle, **characterized in that** the surface of said cylindrical body (11) is partially or totally covered with pressed or profiled sheet metal (19) and, in particular, with embossed sheet metal.
2. Drum (10) according to the previous claim **characterized in that** said covering, made of sheet metal (19), is fixed to said cylindrical body by welding.
3. Drum (10) according to the previous claim **characterized in that** said welding, fixing the sheet metal (19) to said cylindrical body (11), is executed both along the perimeter of the pressed sheet metal (19) and on several internal points of said sheet metal which are in touch with said cylindrical body (11).
4. Drum (10) according to one of the previous claims **characterized in that** it comprises, between said cylindrical body (11) and said covering sheet metal (19), at least one interstice (22) isolated from the outside and connected with inlet (23) and outlet (24) mouths for the circulation of a fluid used for heating or cooling the drum (10), said fluid being connected to an external conditioning set.
5. Drum (10) according to the previous claim **characterized in that** it comprises pipes (26) for inserting and extracting the fluid connected to said inlet (23) and outlet (24) mouths, said pipes run inside the revolving hollow shaft (13) and are jointed to said conditioning set by means of a rotating hydraulic collector (25) placed at one end of said hollow shaft.
6. Drum (10) according to the previous claim **characterized in that** said pipes (26) are placed inside said hollow shaft (13) in such a way that it remains enough free space to allow the chemical bath to circulate in said hollow shaft (13).
7. Drum (10) according to one of the previous claims **characterized in that** said covering, made of sheet metal (19), covers specific portions of the lateral surface and the bottom surfaces of said main cylindrical body (11) of the drum.
8. Drum (10) according to one of the previous claims **characterized in that** said sheet metal (19) is shaped so as to cover all the lateral surface except the zone in which the hatch (12) and its fastening and moving accessories are provided.

