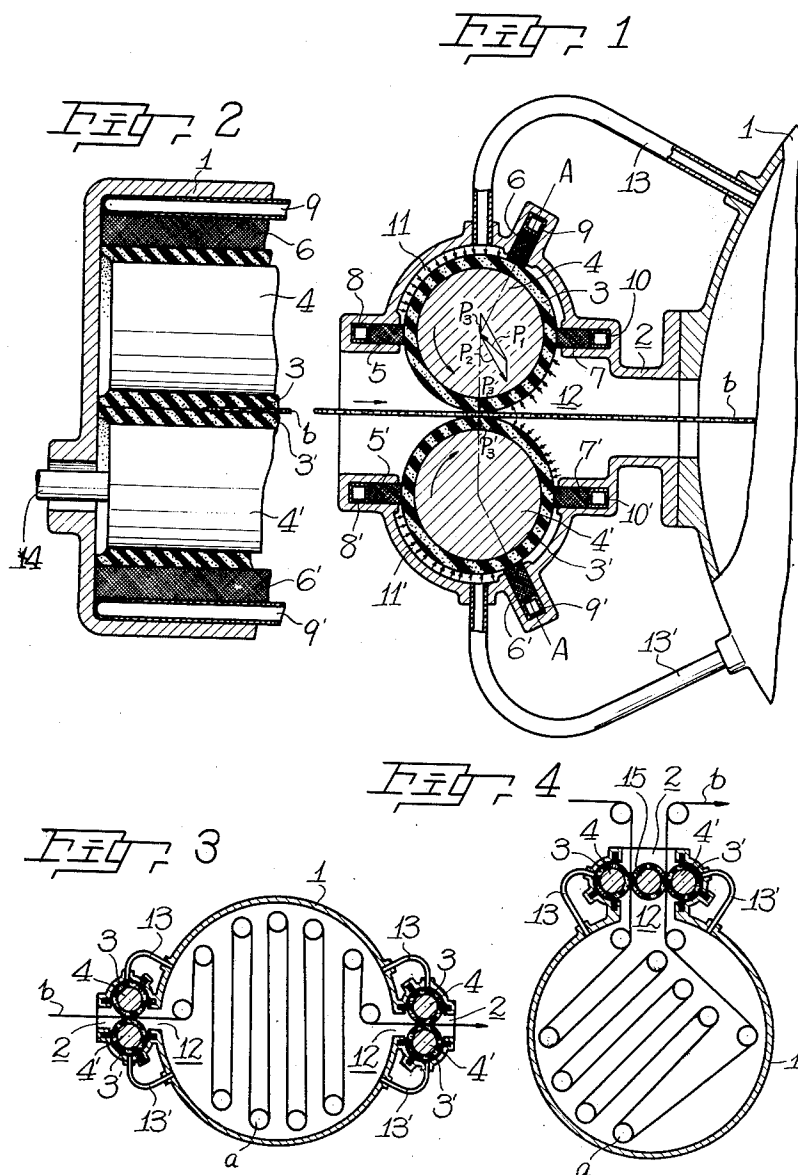


Dec. 4, 1962

SEITARO FUJIHASHI
 APPARATUS FOR AIR-TIGHTLY LEADING TEXTILE FABRICS
 INTO OR OUT OF A PRESSURE CHAMBER
 Filed March 8, 1961

3,066,518



1

3,066,518

APPARATUS FOR AIR-TIGHTLY LEADING TEXTILE FABRICS INTO OR OUT OF A PRESSURE CHAMBER

Seitaro Fujihashi, Kyoto, Japan, assignor to Kyoto Machinery Co., Ltd., Kyoto, Japan, a corporation of Japan

Filed Mar. 8, 1961, Ser. No. 94,190

Claims priority, application Japan Apr. 9, 1960

4 Claims. (Cl. 68—5)

This invention relates to an apparatus for air-tightly leading textile fabrics into or out of a pressure chamber for an equipment for chemically processing the textile fabrics at a high temperature under a high pressure in the pressure chamber.

A principal object of the present invention is to provide an apparatus for leading textile fabrics into or out of a pressure chamber wherein a pressurized fluid in the pressure chamber will not leak out through between the textile fabric and air-tight roller in contact with it when the textile fabric is to be led into or out of the chamber.

Another object of the present invention is to provide an apparatus wherein, when a textile fabric is to be led into or out of a pressure chamber, air-tight rollers in contact with the textile fabric will be able to rotate lightly so that the textile fabric may not be hurt.

A further object of the present invention is to provide an apparatus wherein air-tight rollers are pressed into contact with a textile fabric by utilizing the pressure in a pressure chamber so that any specific pressure-loading device may be omitted and the structure of the apparatus may be simplified and, even when the peripheral surfaces of the air-tight rollers are worn, the air-tightness of the pressure chamber may not be reduced.

The present invention shall now be explained with reference to the drawings.

FIGURE 1 is a vertically sectioned view of an embodiment of the present invention.

FIGURE 2 is sectioned view on line A—A in FIGURE 1.

FIGURE 3 shows a textile processing equipment provided with the above mentioned embodiment of the present invention.

FIGURE 4 shows a textile processing equipment provided with another embodiment of the present invention.

In the drawings, 1 is a high pressure treating chamber which is, for example, cylindrical and is filled under a high pressure with a treating fluid to treat textiles. 2 is an inlet or outlet for textile fabrics which communicates with said high pressure treating chamber 1 and in which two fluid-tight rollers 4 and 4' coated with soft rubber coatings 3 and 3', respectively, are set opposite each other. Three fluid-tight elongated sealing members 5, 6 and 7 or 5', 6' and 7' are disposed, edgewise, in spaced channels provided therefor in the wall of part 2, said elongated sealing members bearing at proper intervals on the periphery of each of both fluid-tight rollers. Said elongated sealing members are pressed against the periphery of each of said fluid-tight rollers 4 and 4', by means of pressure-loading devices 8, 9 and 10 or 8', 9' and 10' each made of an elastic bag such as, for example, of elastic rubber enclosing a pressurized fluid supplied to said elastic bag from a suitable source (not shown) of air under high pressure, whereby pressure-loading chambers 11, 11' and 12 may be formed by said fluid-tight pieces 5, 6, 5', 6' and 7, 7', respectively, pressing against the peripheral surfaces of the fluid-tight rollers 4 and 4'. A pressurized fluid is led from the high pressure chamber 1 into said pressure-loading chambers 11 and 11' through pipes 13 and 13', respectively. The pressurized fluid is

2

also led from the high pressure chamber 1 directly into the pressure-loading chamber 12. *a* is one of a plurality of guide rollers provided in the high pressure chamber 1. *b* is a textile fabric to be led into or out of the high pressure chamber 1 by being held between said fluid-tight rollers 4 and 4'. 14 is a driving shaft for the fluid-tight rollers 4'.

The operation of the apparatus of the present invention shall be explained. In FIGURE 1, if the pressure inflicted on the peripheral surface of the fluid-tight roller 4 by the fluid pressure in the pressure-loading chamber 12 is P_1 and the pressure inflicted on the peripheral surface of the fluid-tight roller 4 by the fluid pressure in the pressure-loading chamber 11 is P_2 , the vector sum of these pressures P_1 and P_2 will be P_3 . Therefore, when the relation between P_1 and P_2 is $P_2 > P_1$, the peripheral surface of the fluid-tight roller 4 will press the textile fabric *b* on one surface with the pressure P_3 at right angles to the surface. Also, for the same reason as is described above, the textile fabric *b* will be pressed on the other surface by the peripheral surface of the fluid-tight roller 4' with a pressure P_3' which is in the direction reverse to that of the pressure P_3 and is of the same value as of said pressure P_3 . Therefore, if the positions of the respective fluid-tight pieces 5, 6 and 7 and 5', 6' and 7' are so determined that the pressures P_3 and P_3' may be aligned with each other, the pressures of both fluid-tight rollers 4 and 4' on the textile fabric *b* will be completely balanced and the textile fabric *b* will be led into or out of the high pressure chamber 1 while being pressed by equal pressures on both face and back surfaces.

The embodiment shown in FIGURE 4 is of the case wherein the textile fabric *b* is led into and out of the high pressure chamber 1 through one opening. In such case, an intermediate roller 15 is rotatably interposed between the fluid tight rollers 4 and 4'. As such intermediate roller 15 is provided, it is possible to lead in the textile fabric *b* between the fluid-tight roller 4 and the intermediate roller 15 and to lead out the textile fabric *b* between the fluid-tight roller 4' and the intermediate roller 15. The operation of this embodiment is the same as of the embodiment shown in FIGURES 1 to 3.

As explained in the above, in the apparatus according to the present invention, as the textile fabric is led into or out of the pressure chamber while being pressed on both face and back surfaces by pressures of the same value and in directions opposite each other by means of both fluid-tight rollers, the pressurized fluid in the pressure chamber will not leak out between the textile fabric and each fluid-tight roller. Both fluid-tight rollers rotate so lightly as to be unlikely to hurt the textile fabric. Further, as both fluid-tight rollers are pressed against the surfaces of the textile fabric by utilizing the fluid pressure in the pressure chamber, it is not necessary to provide any special pressure-loading device and therefore the structure of the apparatus can be remarkably simplified. Even when the peripheral surfaces of both fluid-tight rollers are somewhat worn, the pressurized fluid in the pressure chamber will not be likely to leak out.

What I claim is:

1. In an apparatus for treating a textile fabric web with a treating fluid under superatmospheric pressure within a pressure vessel having a passageway through a wall thereof through which the web passes, the improvement wherein said passageway is constituted by an opening through a tubular structure, said tubular structure containing two peripherally yieldably surfaced rollers disposed parallel and opposite to each other and adapted to receive said web therebetween, those portions of said tubular structure which are adjacent said rollers being enlarged to define hemi-cylindrical housings for said rollers.

3

ers which are spaced from the latter to provide two arcuate pressure chambers each of which is contiguous with a portion of the periphery of the adjacent roller; means for rotating one of said rollers; a plurality of spaced fluid-tight sealing means adjacent those portions of said rollers which are remote from each other, each of said sealing means comprising (1) a yieldable elongated sealing member parallel to said roller and having one edge thereof bearing against said roller and (2) a pressure-loading device coextensive with said elongated sealing member and pressing against an opposite edge of said elongated sealing member whereby said elongated sealing member is pressed into sealing engagement with the periphery of said roller effective for sealing said arcuate pressure chambers; and conduits communicating between the interior of the pressure vessel and said arcuate pressure chambers for equalizing pressures within said vessel and said arcuate pressure chambers whereby said rollers are pressed toward each other and on either side of said web to seal said web between their confronting yielding surfaces.

2. The apparatus defined in claim 1, further characterized in that said pressure vessel is provided with two passageways as defined in claim 1, one of said passageways serving as fluid-tight inlet means and the other of said passageways serving as fluid-tight outlet means for such web, and in that said pressure vessel is provided interiorly of the same with means for guiding such web through said pressure vessel from inlet to outlet thereof.

3. The apparatus defined in claim 1, further characterized in that said passageway includes also a third peripherally yieldably surfaced roller disposed parallel to,

4

and intermediate, and in such relation to, said two rollers that pressure exerted at said pressure chambers on said two rollers tends to press said two rollers against said intermediate roller, whereby one of said two rollers in cooperation with said intermediate roller constitutes a fluid-tight inlet and the other of said two rollers in cooperation with said intermediate roller constitutes a fluid-tight outlet for such web, and in that said pressure vessel is provided interiorly of the same with means for guiding such web through said pressure vessel from said inlet to said outlet thereof.

4. The apparatus defined in claim 1, in which each of said elongated sealing members is disposed in a channel provided therefor in an extension of the wall of said tubular structure and extending radially with respect to the adjacent roller, said elongated sealing member being backed up by one of said pressure-loading devices likewise disposed in said channel and adjacent that edge of said elongated sealing member which is remote from said roller.

References Cited in the file of this patent

UNITED STATES PATENTS

814,124	Fish	Mar. 6, 1906
2,834,193	Fahringer	May 13, 1958
2,873,597	Fahringer	Feb. 17, 1959

FOREIGN PATENTS

718,415	Great Britain	Nov. 17, 1954
---------	---------------	---------------