Aug. 14, 1962 KOICHI NAKAGUCHI 3,048,992

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

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Fig. 1

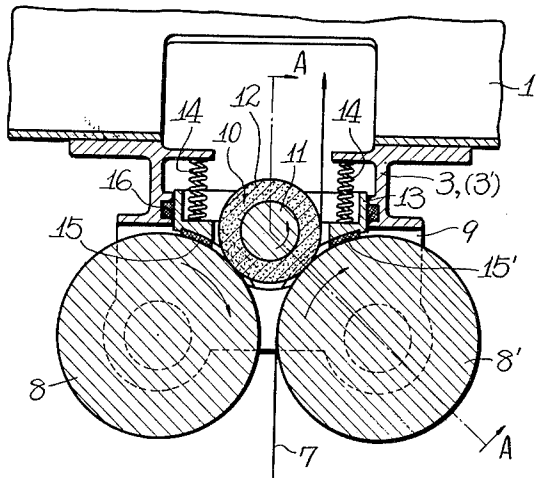
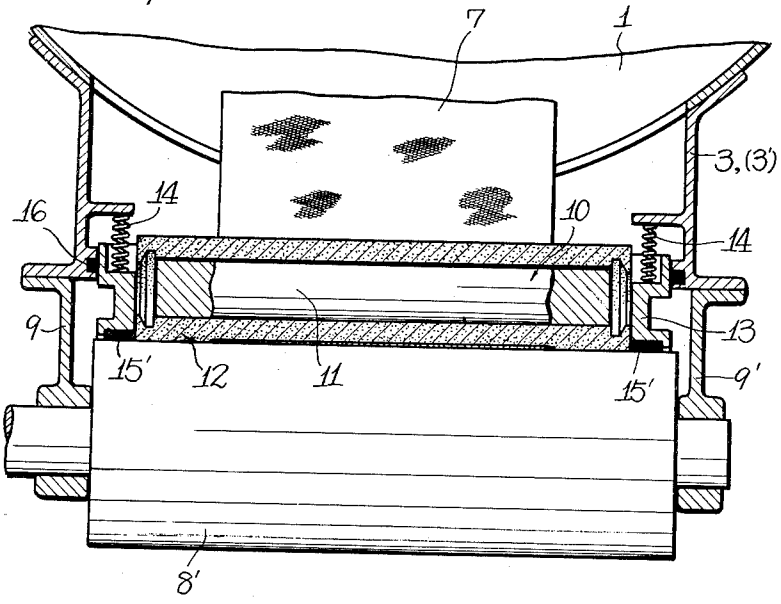


Fig. 2



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

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Fig. 3

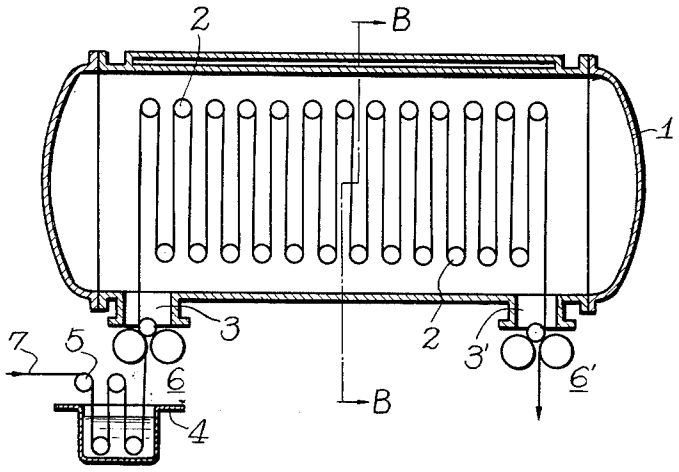
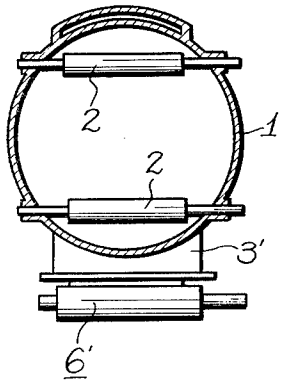


Fig. 4



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3,048,992

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

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3 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.

The present invention provides an apparatus wherein a soft roller is held between two hard rollers rotating in the same direction so that a part of the peripheral surface of said soft roller may be pressed against a part of the peripheral surface of each of both hard rollers by the pressure in a high pressure chamber, therefore the peripheral speed of the soft roller may be equal to that of each of both hard rollers and a textile fabric held between one of the hard rollers and the soft roller may be air-tightly led into or out of said high pressure chamber.

An object of the present invention is to provide an apparatus wherein a textile fabric can be continuously led into or out of a pressure chamber while being kept perfectly air-tight by means of a very simple structure.

Another object of the present invention is to provide an apparatus wherein the peripheral speeds of a soft roller and a hard roller for leading a textile fabric into or out of a pressure chamber by holding it between them are made equal to each other so that any slip between both rollers may be prevented and the textile fabric may not be hurt when it is led in or out.

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

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

FIGURE 3 is a vertically sectioned side view of a high pressure textile processing equipment provided with an apparatus according to the present invention.

FIGURE 4 is a sectioned view on line B—B in FIGURE 3.

An embodiment of the present invention shall be detailed in the following with reference to the drawings. FIGURES 3 and 4 show a high pressure textile processing equipment provided with an apparatus according to the present invention. In the drawings, **1** is a pressure chamber, **2** is one of many guide rollers provided in said pressure chamber and **3** and **3'** are a textile fabric inlet and outlet, respectively, made in the bottom surface of the pressure chamber **1**. **4** is a treating tub filled with a treating solution. A plurality of guide rollers **5** are provided inside and outside said treating tub. **6** and **6'** are apparatuses of the present invention. **7** is a textile fabric to be treated. This textile fabric to be treated is hung on the guide rollers **5** and **2**, is first passed through the treating solution tub **4** so as to be impregnated with the treating solution, is then led into the high pressure chamber **1** through the inlet **3** while being kept air-tight by the apparatus **6** of the present invention, is scoured, bleached or dyed at a high temperature under a high pressure and is air-tightly led out through the outlet **3'** and the apparatus **6'** of the present invention.

Now, the structure and operation of an apparatus according to the present invention shall be explained with reference to the embodiment illustrated in FIGURES 1 and 2. **8** and **8'** are hard rollers made, for example, of a metal. These hard rollers are borne by bearing plates **9** and **9'** provided on the lower surface of said textile fabric inlet **3** or outlet **3'** and are rotated in the same direction by a proper driven means. **10** is a soft roller made by applying a coating **12** made, for example, of an elastic rubber or a soft synthetic resin to the peripheral surface and both end surfaces of a spindle made, for example, of a metal. **13** is an air-tight frame pressed against the upper peripheral surfaces of the hard rollers **8** and **8'** through air-tight plates **15** and **15'**, respectively, by means of a plurality of springs **14**. A packing **16** is provided between the outer wall of the air-tight frame **13** and the inner wall of the textile fabric outlet **3** or inlet **3'**. Said soft roller **10** is held between the hard rollers **3** and **3'** so as to be pressed against the peripheral surfaces of both hard rollers by the pressure in the pressure chamber **1**. The textile fabric **7** is held between said soft roller **10** and one **8'** of the hard rollers and is led into or out of the pressure chamber **1**.

In the apparatus of the present invention, the soft coating on the peripheral surface of the soft roller will be strongly pressed against the peripheral surfaces of both hard rollers by the high pressure in the pressure chamber and the soft coating on each end surface of this soft roller will be also pressed against the inner surface of the air-tight frame by the high pressure in the pressure chamber so that the peripheral speed of the soft roller may be equal to that of each hard roller and there may be no slip between them. Therefore, the textile fabric held between the soft roller and the hard roller will be led into or out of the high pressure chamber substantially perfectly air-tightly and will not be likely to be hurt in such case. Further, the apparatus according to the present invention is so simple in the structure as to have an advantage that its manufacturing cost is low.

What I claim is:

1. In an apparatus for treating a textile fabric web under pressure including a pressure chamber having a pair of spaced orifices therein for passage of such web into and out of said chamber, the improvement which consists essentially in a pair of devices for air-tightly passing such web into and out of said chamber each of said devices comprising:

a pair of spaced bearing plates secured to the lower surface of said orifice; a pair of hard-surfaced rollers mounted parallel to each other, between said bearing plates, for rotation in the same direction; an air-tight frame fitting said orifice; gasketing means interposed between portions of the peripheral surfaces of said hard-surfaced rollers and the lower surfaces of said frame; means resiliently urging said frame at said gasketing means, against said portions of the peripheral surfaces of said hard-surfaced rollers; a bearingless soft roller disposed within said frame above and parallel to and in peripheral contact with said hard rollers, the peripheral surface of said soft roller being formed of readily yielding elastic material and having the peripheral edges of both of its end surfaces formed of readily yielding elastic material, said soft roller having such a length that its end surfaces are in contact with opposite inside surfaces of said frame,

said soft roller being adapted in use to be pressed air-tightly, by superatomspheric pressure maintained within said chamber, against said frame surfaces and said hard-surfaced rollers and to be driven by frictional engagement with said hard-surfaced rollers at a peripheral speed equal to the peripheral speeds of said hard-surfaced rollers whereby a textile fabric web may be held between one of the hard-surfaced rollers and said soft roller and be air-tightly led through said orifice.

2. The improved apparatus defined in claim 1, further characterized in that said readily yielding elastic material is a soft rubber.

3. The improved apparatus defined in claim 1, further characterized in that said readily yielding elastic material is a soft synthetic resinous material.

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