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PRESSING AND IRONING MACHINE

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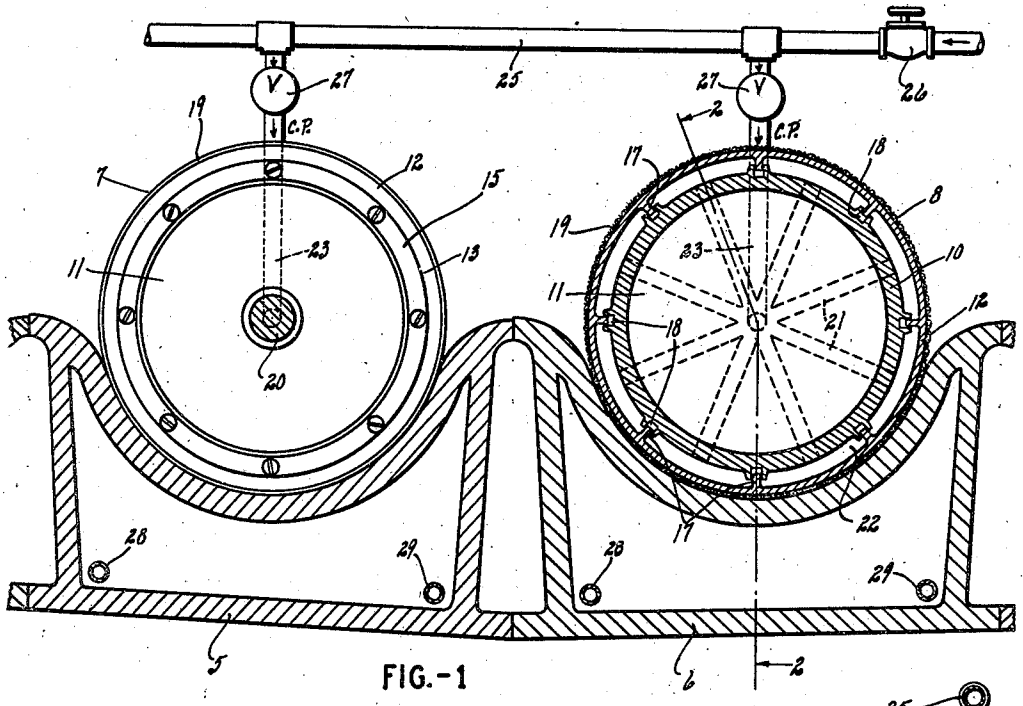


FIG.-1

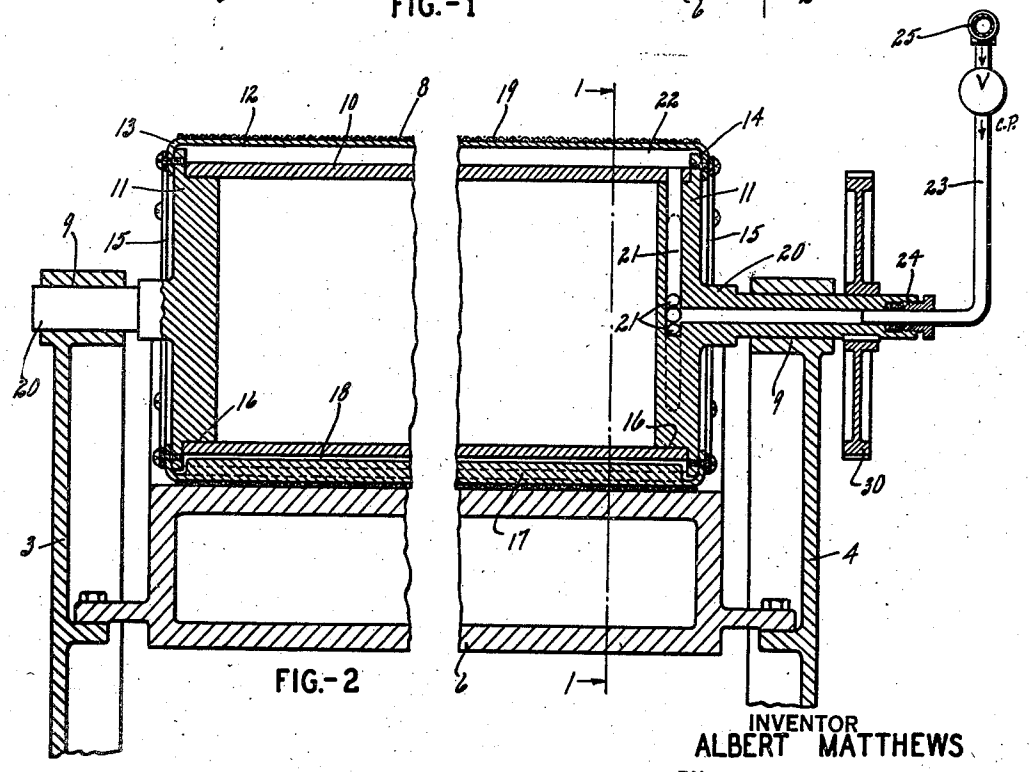


FIG.-2

INVENTOR
ALBERT MATTHEWS

BY
Brockett, Hyde, Higley & Meyer
ATTORNEYS

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PRESSING AND IRONING MACHINE

Albert Matthews, Cincinnati, Ohio, assignor to The American Laundry Machinery Company, Norwood, Ohio, a corporation of Ohio

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6 Claims. (Cl. 38—56)

This invention relates to an improved means for exerting pressure on sheet material passing between coacting members for any operation requiring such exertion of pressure upon the material. More particularly, my invention is illustrated as applied to a flatwork ironer.

An object of my invention is to provide a pair of coacting elements for exerting pressure on sheet material traveling therebetween in which two rigid members are mounted a relatively fixed distance apart and a fluid-tight casing is provided on one of said members and expansible toward the other of said members, together with means supplying fluid under controlled pressure to said casing so as to regulate the pressure exerted on the material.

Another object of my invention is to provide a novel roll construction adapted to exert ironing pressure on articles passing between a roll and chest, as in the usual flatwork ironer, and in which the roll has a peripheral wall expansible toward the chest by fluid pressure.

Other objects and advantages of my invention will be apparent from the accompanying description and as illustrated in the drawing, in which Fig. 1 is a partial section through a flatwork ironer showing two rolls with their respective ironing chests, one of the rolls being shown in elevation and the other in section, taken on the line 1—1 of Fig. 2; while Fig. 2 is a section of a roll and chest, taken on the line 2—2 of Fig. 1.

My invention contemplates the provision of novel apparatus for exerting pressure on sheet material passing between a pair of coacting members by the expansion of a fluid casing on one member toward the other member so as to provide a uniformly distributed pressure over the surface acted upon while at the same time providing a yielding surface capable of adapting itself to inequalities in the treated material. Such apparatus has many applications in industry, but I have chosen to illustrate my invention as applied to apparatus for ironing laundry goods. As is well known, such ironing operations may be carried out between platen and platen, roll and platen, or roll and roll, either with or without the use of an apron or conveyor for carrying the the goods between the ironing or pressing members. While I have chosen to explain my invention as applied to an ironer of the roll and platen type, I do not desire to be limited in the practice of my invention except as limited by the scope of the appended claims.

In the drawings, I have illustrated a portion of a flatwork ironer comprising side frames 3 and 4 supporting chests 5 and 6, and rollers 7 and 8 adapted to coact with said chests and rotatably mounted in suitable journals carried by the frame, as indicated at 9. Since the construction of the two rolls is similar, one only will be described.

The roll construction comprises an inner rigid member 10 to which are secured end head members 11 which are circular in form and extend radially beyond the confines of the inner rigid member in a manner to support an outer cylindrical casing or pressure member 12 in spaced relation to the inner member. This outer casing is secured to the head members by a fluid-tight connection which in the form illustrated is provided by turning over end portions 13 and 14 of the casing and securing them by means of rings 15 to the heads. Preferably the rigid inner member 10 is cylindrical in form and may be secured to the head members by machining thereon a shoulder 16 of lesser diameter than the portion of the head supporting the outer casing and thereafter the member 10 may be shrunk on the shoulder 16 in the manner customary in the fabrication of ironing rolls. This provides a fluid-tight compartment bounded by the inner peripheral surface of the casing, the outer peripheral surface of the cylinder 10 and the head members 11.

Means is provided for securing a driving relation between the outer casing and the inner member which preferably takes the form of coacting projections and guides on the outer and inner members arranged to provide a driving connection while permitting a limited radial movement of the casing with respect to the inner member. In the form shown, ribs 17 extend longitudinally of the inner peripheral surface of the casing and coact with corresponding grooves 18 formed in the outer peripheral surface of the cylinder 10. These coacting rib and groove pairs are spaced circumferentially about their respective cylindrical surfaces and are of such an extent that they remain in coacting relation when the casing is extended outwardly by fluid pressure applied between the inner and outer members, as illustrated in Fig. 1.

The outer casing member is formed of a substantially non-elastic but slightly expansible material and preferably of a woven fabric impregnated in a manner to render it impervious to air, water or other fluid with which it may be placed in contact. Preferably also, the ribs 17 are formed integral with the outer casing which may be done by forming certain plies of the impregnated fabric in a manner to provide such

ribs. The casing may also be provided with an outer muslin covering 19 if desired.

Means is provided for supplying fluid under pressure to the space between the inner rigid member 10 and the outer casing. In the form shown, the end head members 11 are provided with supporting shafts or gudgeon pins 20 one of which is hollow and passages 21 extending radially of one of the head members are in communication on the one hand with the hollow shaft and on the other hand with the space 22 between the inner and outer members, thus providing means for expanding the outer casing in a radial direction relative to the inner member. Preferably these radial passageways 21 are sufficient in number to provide one for each space between the coacting rib and groove pairs.

The fluid pressure supply is led into the hollow shaft 20 by a conduit 23 provided with a packing gland 24 to prevent leakage. These conduits for the individual rolls are supplied from a main supply line 25 connected with a suitable source of fluid pressure under control of valve 26. The pressure exerted to expand the casing of each roll may be controlled individually or collectively and preferably a pressure regulator or control valve 27 is provided for each roll of known type adapted to maintain a constant pressure on the outlet side of the valve. Where the ironing machine comprises a plurality of rolls, the pressure may be equal throughout the series or the pressure may be varied from roll to roll by setting the control valves to maintain different pressures for each roll in the series.

Where material is passed between two pressure members for purposes of creating an ironing effect, one of these members is usually heated, and while I contemplate that heat might be supplied by means of the fluid in the space 22, in the form illustrated the chests 5 and 6 are supplied with steam or other heating medium by way of inlet and outlet conduits 28 and 29.

Means is provided for passing sheet or web material between the coacting pressing members which, as stated before, might be by apron means, but as illustrated it is contemplated that the roll 8 will be rotated by means of a gear 30 mounted on the shaft 20 and rotatable by suitable mechanism, such for instance as a motor (not shown) connected by a train of gears with the gear member 30.

I have thus provided an improved ironing roll having a peripheral surface adapted to exert an evenly distributed pressure over the surface thereof while at the same time adapted to perfectly conform itself to inequalities of material pressed in contact therewith.

I have also provided novel means for regulating the pressure between roll and roll or roll and platen in a series of such coacting pressing members arranged in a flatwork ironer and which does not require the cumbrous mechanism hitherto used. That is to say, in the form illustrated neither the roll or platen need be moved but may be permanently fixed in coacting relationship and pressure may be applied as desired and the intensity of such pressure regulated by means of a very flexible fluid pressure control.

What I claim is:

1. An ironing roll, comprising an inner rigid member having a substantially cylindrical body portion and circular end heads, an expansible fluid tight substantially cylindrical outer casing member having a fluid tight connection with said heads and surrounding and spaced from said inner member, means for supplying fluid under pressure to the space between said members, and driving means connecting the inner and outer members and lying in the space between them.

2. An ironing roll, comprising an inner rigid member having a substantially cylindrical body portion and circular end heads, an expansible fluid tight substantially cylindrical outer casing member having a fluid tight connection with said heads and surrounding and spaced from said inner member, means for supplying fluid under pressure to the space between said members, and interconnecting guiding means lying in the space between said inner and outer members and comprising projections on one member and cooperating radially extending guides therefor on the other member with respect to which said projections have limited movement radially of the roll.

3. An ironing roll of the form described in claim 2, wherein the fluid supply means comprises a passageway in one of said heads and a channeled shaft connected with said inner member and having its channel in communication with said passageway.

4. An ironing roll comprising an inner rigid member having a substantially cylindrical body portion and end heads of greater diameter than the body portion, an outer fluid tight cylindrical casing having a fluid tight connection with said heads and radially spaced from said body portion, said casing being formed of non-elastic, slightly expansible material, rib and groove members extending longitudinally of opposed surfaces of said body portion and casing and spaced about the circumferences thereof, said members being arranged to coact during limited radial movement of said casing, and means for supplying fluid pressure to the space between said body portion and casing to thereby expand the casing.

5. An ironing roll comprising an inner rigid cylinder having a body portion and end heads of greater diameter than the body portion, an outer fluid tight cylindrical casing having a fluid tight connection with said heads and radially spaced from said body portion, said casing being formed of impregnated fabric, said body portion being provided with longitudinally extending grooves spaced circumferentially about its outer surface, ribs integral with said casing and projecting from its inner walls into said grooves and adapted for limited radial movement therein with flexure of said casing, and means for supplying fluid under pressure to the space between said casing and body portion.

6. In combination, a heated chest, a roll member mounted a fixed distance from said chest, a fluid-tight cylindrical casing on said roll member expansible into pressure engagement with said chest, said chest having an arcuate surface adapted to coact with a large portion of the surface of said casing of the order of one-third the circumference thereof, means for supplying pressure fluid to said casing, means for passing fabric material between said casing and chest, and means for controlling the pressure of said fluid supply whereby to regulate the pressure exerted on said material.

ALBERT MATTHEWS.