(No Model.)

G. ROTHHOLZ.

MACHINE FOR SPONGING AND SHRINKING CLOTH.

No. 511,216. Patented Dec. 19, 1893.

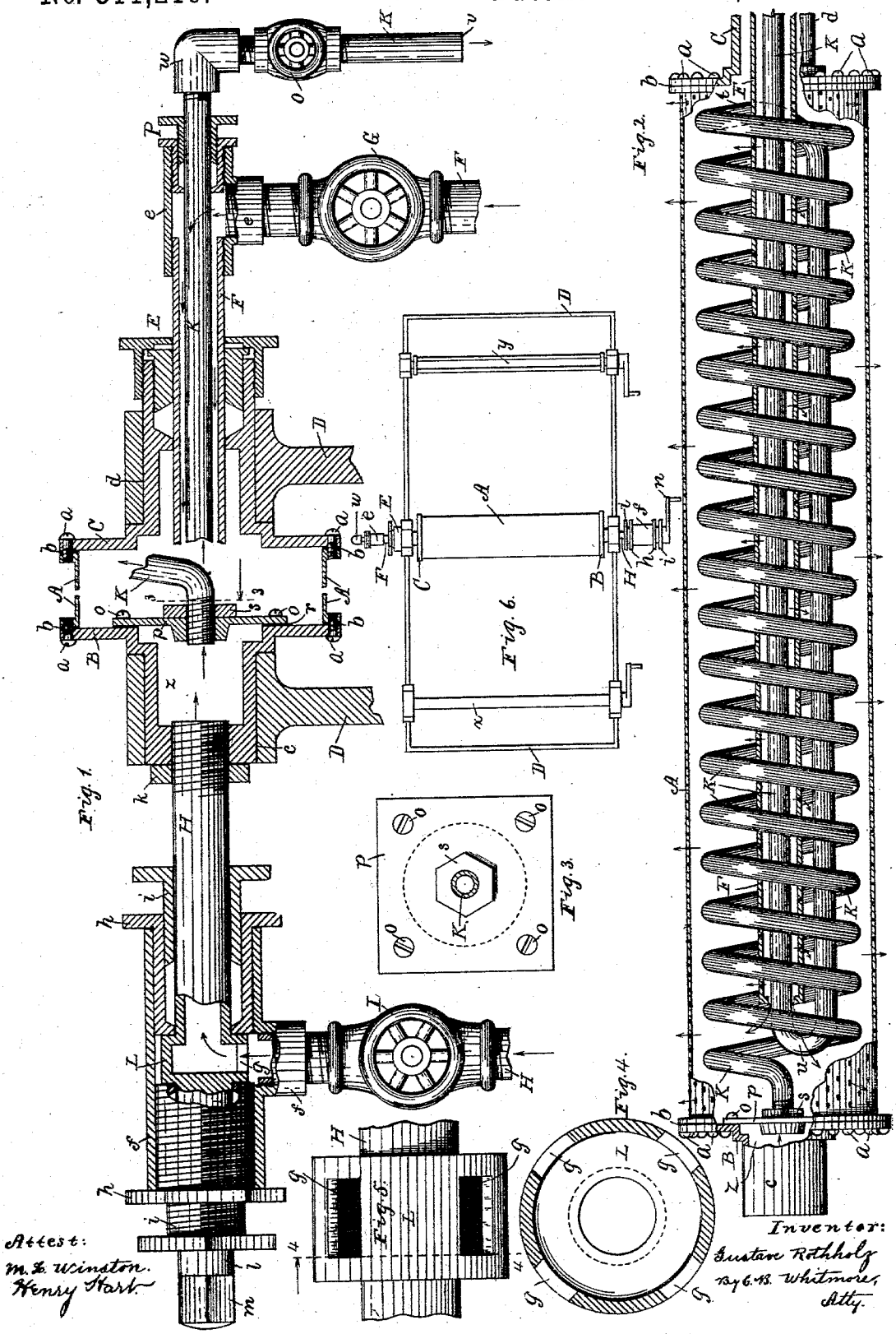

Fig. 1.

Fig. 2.

Fig. 6.

Fig. 3.

Fig. 4.

Fig. 5.

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MACHINE FOR SPONGING AND SHRINKING CLOTH.

SPECIFICATION forming part of Letters Patent No. 511,216, dated December 19, 1893.

Application filed August 30, 1893. Serial No. 484,368. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE ROTHHOLZ, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Machines for Sponging and Shrinking Cloth, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention relates to machines for dampening and shrinking cloth in the roll by using steam, and the main object of the invention is to supply dry steam to the cloth so that the latter shall be evenly and uniformly dampened and not oversaturated in spots. To accomplish this result I employ a horizontal perforated metal drum and introduce into it in bulk through one end live steam through an axial perforated pipe extending nearly the whole length of the interior of the drum. This steam introduced into the drum, under pressure, passes out through the perforations in the drum and enters the cloth wound thereon. To render this steam dry, I introduce into the drum at the opposite end through an imperforate pipe another current of steam, the pipe being bent in spirals or otherwise to occupy a considerable portion of the space within the drum. This steam pipe imparts additional heat to the bulk or free steam filling the drum which serves to vaporize any particles or small masses of water that may chance to be introduced into or form within the drum from the free steam contained therein. This additional heating of the free steam within the drum insures an outward flow of dry steam from the drum into the cloth.

The invention is hereinafter more fully described and particularly pointed out in the claims.

Referring to the drawings, Figure 1, condensed, shows the parts at the ends of the steam drum mainly in longitudinal section, parts being broken away. Fig. 2 shows the steam drum, with the interior parts, the drum and the steam supply pipe being centrally and longitudinally sectioned, parts being broken away. Fig. 3 shows the holder for the drying pipe the latter being transversely sectioned as on the dotted line 3 3 in Fig. 1, and viewed as indicated by the arrow pointed thereon. Fig. 4 is a transverse section through the inlet head for the drying steam, taken on the dotted line 4 4 in Fig. 5, and viewed as indicated by the arrow pointed thereon. Fig. 5 is a side elevation of the inlet head. Fig. 6 shows the relative position of the steam drum and other parts of the machine. Figs. 2 and 6 are drawn to scales smaller, and Figs. 4 and 5 to a scale larger, than that of Figs. 1 and 3.

In this invention a horizontal perforated metal steam drum or cylinder A, is provided having heads, B C, secured thereto with holding screws *a*, simple packing rings *b* being inserted between the heads and the adjacent ends of the drum. The heads are formed with cylindrical hubs, *c d*, which constitute journal bearings for the drum, resting in the frame D. The head C is extended beyond the bearing in the frame to form part of an ordinary stuffing box E, as shown in Fig. 1.

F, Figs. 1 and 2, is a steam supply pipe for the drum leading from some convenient steam generator. This pipe includes a common T connection *e*, and is provided with a valve G of common construction to control the passage through it. The pipe F passes through the stuffing box E and the head C, and extends nearly the whole length of the drum, as shown in Fig. 2, the axes of the drum and pipe being common. This pipe is perforated within the drum and formed with an open inner end, so that the inflowing steam may escape evenly into the drum as indicated by arrows; thence the steam flows outward through the perforations in the sides of the drum to enter the cloth wound thereon.

H is a steam heating pipe, leading into the drum through the head B. This pipe includes a T coupling *f*, and is provided with a valve I of common construction and leads from a steam generator the same, or other than, the one from which pipe F leads. The pipe H is formed with an enlarged part L constituting an inlet head for the inflowing steam. This head is hollow and cylindrical, and it is formed with one or more peripheral openings, *g*, Figs. 4 and 5, through which the steam enters. This inlet head is central within the T coup-

ling *f*, as shown in Fig. 1, and stuffing boxes *h h*, are threaded into the opposite ends of the T coupling their inner ends being in easy contact with the inlet head. Glands *i i* of common kind are threaded into the stuffing boxes *h h*. The pipe H passes through the right-hand stuffing box in the T coupling *f*, and is threaded into the end of the hub B, opening into the space *z* therein. A jam nut *k*, is provided to hold the pipe firmly in the head. A stem *l*, preferably solid, extends from the inlet head outward through the left-hand stuffing box and is squared at *m* to receive a crank, *n*, Fig. 6.

A metal diaphragm *p*, Figs. 1, 2 and 3, is secured to the inner face of the head B by simple fastening screws *o*, in position to cover the space *z* in said head. A packing ring *r* is usually employed to render the joint between *p* and B steam tight. Into the diaphragm, I insert horizontally the end of a spiral pipe K, as shown, communicating with the space *z*, and consequently with the interior of the pipe H. The manner of securing this pipe to the diaphragm or holder *p* is not essential care being taken to have the parts rigid and steam tight. I usually thread the parts together, as shown, and employ a jam nut *s*, to more firmly unite the parts. The pipe K is imperforate and extends the entire length of the interior of the drum, and bends at *t* to return within the coil to a point *u* near the diaphragm where it again bends and passes longitudinally through the horizontal portion of the pipe F, and out through a stuffing box P inserted in the T coupling *e*, thence into the open air, terminating at *v*. Now it will be understood that the pipes H and K (together with the space *z*) form a continuous passage into, through and out of the drum A and that steam entering the pipe H will traverse the entire length of the pipe K and out through the opposite head (C) of the drum without communicating with the free steam filling the body of the drum. Thus there are two independent currents of steam flowing into and through the drum in opposite directions, one escaping through the perforations in the sides of the drum, and the other along a passage through the opposite head of the drum into the open air beyond. On account of the form given the steam-drying pipe K there is great length of it within the drum, it filling a considerable part of the space within the latter, and all of the bulk steam at any time within the drum is either in contact with or near to the pipe and is rendered dry from the heat given off from said pipe. A valve O of common construction is added to the pipe K, near its terminus, to control the passage through it. The inner end of the pipe F, Fig. 2, is formed with an open head through which the pipe K passes, space being left around the pipe K out through which steam may flow to the extreme end of the drum. Now it will be observed that when the drum is turned to wind the cloth on or off, the horizontal portion of the pipe H and the entire pipe K turn with it, while the supply pipe F is stationary. The part of the pipe K from the elbow *w* to the end *v* sweeps around in a circle when the drum is turned and at each time the extreme end *v* points downward any condensed water or drip that the pipe may contain escapes into a suitable receptable placed beneath it, and the flowing of steam from pipe H through K tends to carry any condensed water that may form in the latter pipe out at the discharge end *v*.

The perforated drum A is mounted transversely upon a frame D, Fig. 6, in the usual manner, a delivery roll *y* for the cloth and a receiving roll *x* being also mounted on the frame, each being provided with a crank, as shown, to operate it, said rolls *x* and *y* co-acting with the drum in treating the cloth as stated.

What I claim as my invention is—

1. In a machine for sponging cloth a perforated rotary drum provided with heads, in combination with a supply pipe entering the drum through one head, and communicating with the interior of the drum, and a second steam pipe, H, opening into the other head of the drum, and an imperforate pipe within the drum forming with the pipe H a continuous passage out through the opposite head of the drum, substantially as shown and described.

2. In a machine for sponging cloth a perforated rotary drum provided with heads, in combination with a supply pipe F entering the drum through one head, and a second steam pipe, H, opening into the other head of the drum, and an imperforate pipe K within the drum communicating with the pipe H and passing out through the opposite head of the drum, said pipe K being bent around the pipe F, substantially as shown and described

3. In a machine for sponging cloth a perforated rotatory drum provided with heads, in combination with a supply pipe F entering the drum through one head and a steam pipe, H, opening into the other head of the drum, and an imperforate pipe K within the drum forming with the pipe H a passage out through the opposite head of the drum, said pipes H and K being rigid with the drum and turning therewith, and the pipe F stationary, substantially as shown and described.

4. In a machine for sponging cloth a perforated rotatory headed drum and a steam supply pipe F opening into the drum at one end, in combination with a pipe K within the drum, and a steam pipe, H, communicating with the pipe K through the opposite end of the drum from that through which the pipe F enters, the pipe K leading out of the drum at the end where the pipe F enters, said pipes together forming two independent passages for steam flowing in opposite directions, one discharging through the perforations in the

sides of the drum, and the other along a passage through the head of the drum, substantially as shown and described.

5. In a cloth sponging machine a perforated headed drum and a steam supply pipe F therefor entering at one end of the drum, in combination with a pipe K within the drum and rigid therewith, and a steam pipe H communicating with the pipe K, the latter passing longitudinally through the pipe F and discharging without the drum, substantially as shown and described.

6. In a cloth sponging machine a perforated headed drum and a perforated steam supply pipe F entering the drum at one end and extending nearly to the other end of the drum, in combination with an imperforate pipe K within the drum, and a steam pipe H communicating with the pipe K through a head of the drum, the pipe K being bent around the pipe F and passing longitudinally through the latter, the axes of the drum and the pipe F within the drum and the part of the pipe K within the pipe F being common, substantially as shown and described.

7. In a machine for sponging cloth a perforated rotatory drum provided with heads, in combination with a supply pipe F for the drum entering through one head thereof, and a second steam pipe, H, opening into the other head of the drum, and an imperforate pipe K within the drum communicating with the pipe H and leading out through the opposite head of the drum, said pipes F, H and K being provided with valves for regulating the passages through them, substantially as shown and described.

In witness whereof I have hereunto set my hand, this 25th day of August, 1893, in the presence of two subscribing witnesses.

GUSTAVE ROTHHOLZ.

Witnesses:

ENOS B. WHITMORE,

M. L. WINSTON.