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FELT CLEANER FOR PAPER MAKING MACHINES

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2 Sheets-Sheet 1

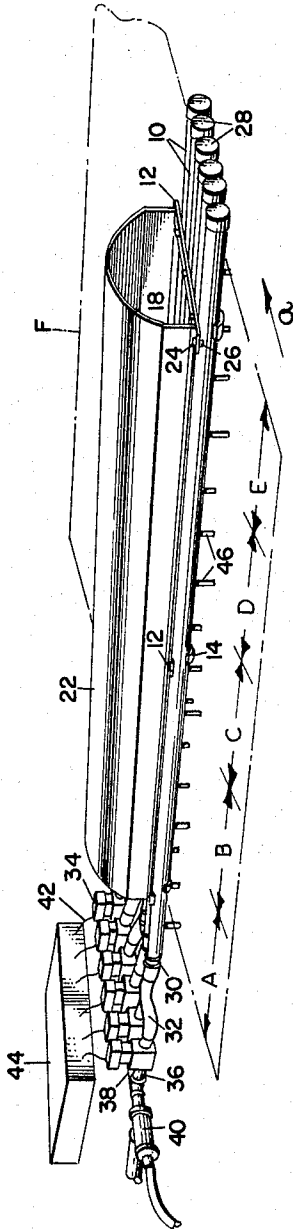


Fig. 1

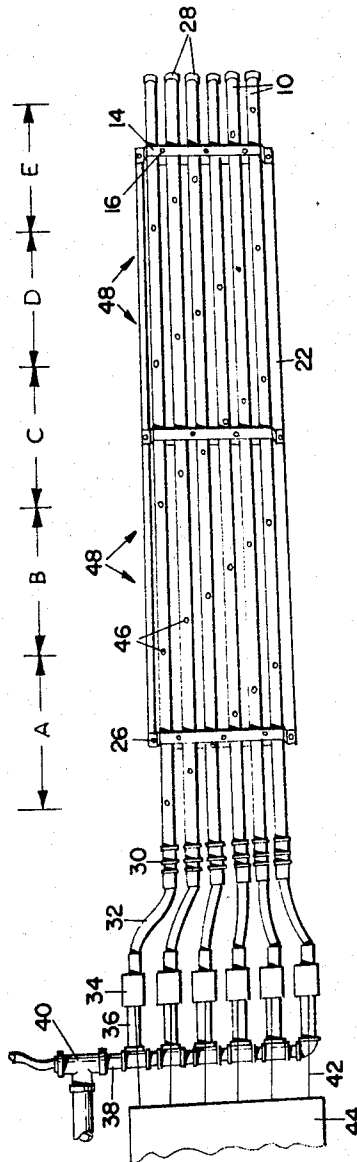


Fig. 2

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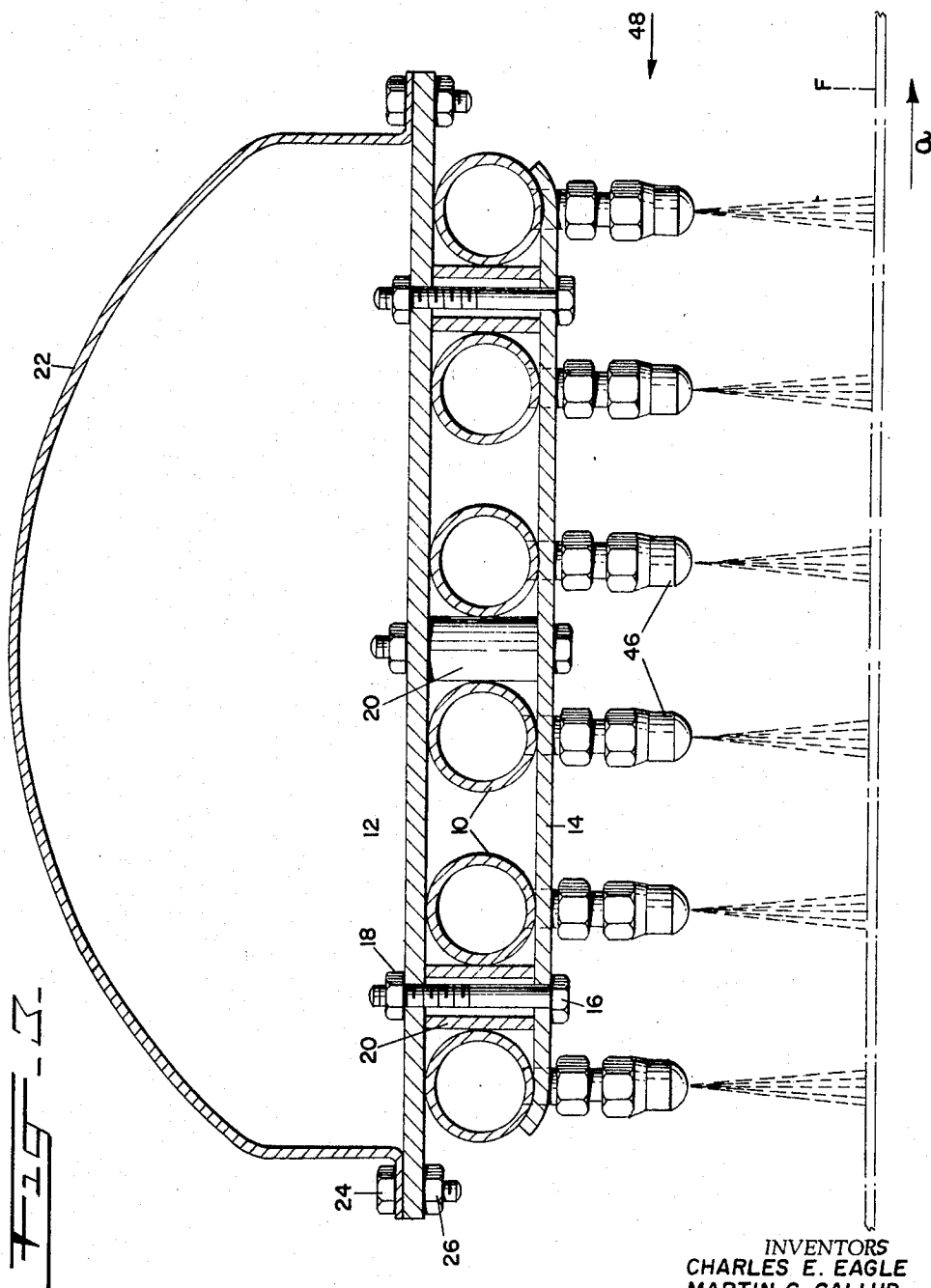


FIG. 3

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FELT CLEANER FOR PAPER MAKING MACHINES

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Our invention relates to improvements in automatic cleaning devices for paper making machines, and a primary object of the invention is to provide a device of such character for the purpose of cleaning the felt at the wet end of a paper making machine and without interfering in any way with the machine operation.

One object is to provide an apparatus for use cooperant with the felt of a paper making machine wherein the felt is subjected to the action of jets of water under pressure to dislodge the impurities in the felt, with the water and impurities being removed from the felt by suction boxes.

Another object hereof is to provide a device which will concentrate a pressure of a suitable fluid on the felt in manner such that all foreign matter is removed therefrom.

With felt conditioners of the prior art, the operation is to spray a mixture of water, steam and detergent, or any combination of these liquids, onto the felt. To do this, nozzles are spaced a given distance apart, and by means of an oscillating mechanism, the nozzles go back and forth and, theoretically, cover the entire width of the felt.

The basic principle of this invention is a cycling arrangement incorporating solenoid valves and a timer. A series of pipes are connected to operate at intervals which can be controlled by the timer. As one pipe is shut off, the next one comes on with a slight fraction of a second overlap. The pattern that this conditioner will give on the felt is similar to the other types of conditioners, except there will not be sections where the felt will receive more water during a given period than other sections. All parts of the felt will receive exactly the same amount, and the necessity for oscillating the nozzles back and forth across the felt has been eliminated.

A still further object is to provide a device which will be stationary relative to the machine and which during operation of the machine will cover the entire area of the felt, all in manner so as to cause the jets of fluid to reach the full surface of the felt as the felt is moved longitudinally. In such prior art devices as are known, relative movement of the cleaning mechanism has been required, necessitating more or less flexibility in the conduit through which the fluid is delivered to the mechanism. In this connection, a problem has arisen in connection with the support of the flexible conduit so as to be free of contact with the felt while at the same time permitting the flexibility essential to permit the spraying apparatus to move to and fro across the felt.

Herein, I provide a stationary mechanism having a plurality of nozzles disposed in groupments or sets across the entire width of the felt. By means of these nozzles, a water and steam mixture, with or without a detergent additive, is sprayed on the felt to cover the entirety thereof and the excess water and dirt are removed by a felt suction box. By such means, the felt life is greatly increased, the use of shorter felts is made possible, and continuous operation without the necessity of slowing down for clogged felts is permitted.

We provide a novel felt cleaner which may be used with high speed paper machines, which eliminates the aforesaid objectionable inconveniences. On the basis of the factors involved, it is capable of solving the difficulties heretofore encountered and assures the adequate con-

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ditioning of felt on modern paper machines having a width in excess of 150" and/or having a running speed in excess of 500 feet per minute.

In the drawings:

FIG. 1 is a perspective view showing a felt conditioner constructed and arranged to operate in accordance with a practical embodiment of the invention;

FIG. 2 is a perspective bottom plan view of the felt conditioner of the invention; and

FIG. 3 is an enlarged sectional view taken transversely through the felt conditioner of the invention.

With continued reference now to the drawings, we have shown a felt conditioner comprising generally a plurality of spaced, parallel, longitudinally-extending pipes or conduits 10 of a suitable length to completely span the width of a felt F, travelling transversely therebelow in the direction of the arrows *a* in FIGS. 1 and 3.

It will be understood that the conditioner hereof is stationarily secured by any suitable means at the wet end of a paper making machine so to be disposed immediately above the travelling felt.

While six of the pipes 10 have been shown in the drawings, any number may be employed to meet local requirements.

Pipes 10 are held in the above-described relationship by a plurality of pairs of upper and lower brackets, 12 and 14 respectively, extending transversely thereacross, and secured to each other as by vertically disposed bolts 16 extending therethrough, and having nuts 18 threaded thereon.

A plurality of vertically-extending cylindrical spacers 20 (see FIG. 3), are sleeved on the bolts 16 between upper and lower brackets 12 and 14 respectively, and serve to retain the pipes 10 in desired spaced relationship.

A hood 22 is disposed above the pipes 10 and is substantially co-extensive therewith. Hood 22 is fixed to the upper brackets 12 by bolts 24 extending vertically therethrough and through said upper bracket, said bolts having nuts 26 threaded thereon. Hood 22 serves to impart rigidity to the unit and also serves as an anti-splash guard and dust shield for the felt F as it travels under the pipes 10.

Each of the pipes 10 has a cap 28 fixed to one end and a quick release coupling 30 fixed to its opposite end, said coupling being adapted to releasably hold one end of a flexible hose 32 fixed at its opposite end to a solenoid valve 34.

Each solenoid valve 34 is connected by a conduit 36 to a header 38, capped at one end and having provision at its opposite end as at 40 for the entrance of a pressurized mixture of water, steam and detergents, from suitable sources of supply thereof, not shown.

Each solenoid valve 34 is additionally connected, as by suitable leads 42, to a repeat cycle timer 44.

For a six-pipe conditioner such as that shown in the drawing, the timer will incorporate six switches, not shown, set to a twenty-four second time cycle. The number of switches and the time cycle will, of course, vary depending upon the number of pipes used.

The timer 44 controls the operation of a plurality of spray nozzles or jets 46 depending from the lower peripheral surfaces of each of the pipes 10, the jets in each pipe being equally spaced from each other.

The timer may be of such design as to enable the operator to stop the cycle at any one of the pipes whereby a prolonged treatment may be given to the felt at any spot where a particularly dirty area appears. After the pipe covering the area to be cleaned has been allowed to remain on as long as desired, the switch is again turned on and the cycle picks up where it left off.

The jets 46 are so positioned as to provide a plurality

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of spaced, parallel sets or groupments, generally indicated by 48, each such set or groupment comprising six jets and extending in a row at an oblique angle relative to the axes of the pipes 10, so as to define sectors throughout the longitudinal extent of the pipes and the felt therebelow.

As shown in FIGS. 1 and 2, one set or groupment 48 of the jets 46 covers a sector A of the felt F, the next set or groupment a sector B, and so on through sector E throughout the longitudinal extent of the felt. Such sectors may be disposed in seriatim as shown, or one sector may slightly overlap the other.

With the timer 44 set on a twenty-four second time cycle, the six jets 46 in each groupment 48 thereof are actuated one after the other to spray a pressurized mixture of steam, water and detergent in each sector A through E of the felt F travelling therebelow, each jet having a spraying time of four seconds.

For example, the first jet 46 in each groupment, that is, all of the jets in the first pipe encountered by the travelling felt, sprays for four seconds; immediately before these jets are shut off by their respective solenoid valve 36, the next jet in each groupment, that is, all of the jets in the next pipe encountered by the travelling felt, are actuated by their respective solenoid valve, to spray for four seconds. This procedure is repeated for the remaining jets in each groupment, wherefore all of the sectors A through E of the felt have been sprayed at which time the cycle is repeated.

By the novel arrangement above described, the entire width of the felt is sprayed, without the necessity of reciprocating the conditioner.

By adjustment of the 6-cycle timer, the conditioner can be set to clean the full width of the felt once every complete revolution of the felt; or once every two revolutions; or twice every one revolution; or any interval desired, depending on the particular application.

The 24 second cycle will be varied on commercial installations as required by machine speed and other considerations, and the timer can be located any given distance from the conditioner.

The conditioner hereof is intended to be suitable for use on paper machines of the smallest felt width and slowest speeds, as well as for the widest felt widths and fastest speeds of modern paper machines.

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Our conditioner is additionally intended for use with a felt cleaning system which, in addition to incorporating a conditioner, preferably also incorporates a shower and suction.

With our conditioner, all moving parts have been eliminated and the jet spray pattern is such that all areas of the felt will receive exactly the same amount of cleaning. Also, with this invention, no more water, steam, or detergent will be required than was previously required with the reciprocating conditioners of the prior art, same being an important feature, as this is the principal difference and advantage of a conditioner versus a shower. A shower requires about six times the amount of water, steam and detergent, which is a very expensive operational cost for a mill.

We therefore particularly point out and distinctly claim as our invention:

1. A felt conditioner for a paper machine having a travelling felt comprising, a plurality of spaced parallel and stationary conduits extending transversely of the felt, a plurality of equally-spaced spray nozzles depending from each conduit, the nozzles of each conduit being staggered relative to the nozzles of adjacent conduits to form substantially straight parallel rows of nozzles extending at oblique angles relative to the axes of said conduits, header means for feeding a pressurized mixture of steam, water and detergent to said conduits, solenoid valves between said header and each said conduit, a timer connected to and controlling the operation of said solenoid valves, said valves delivering the mixture to said conduits in seriatim for discharge through said spray nozzles onto the travelling felt in staggered rows so that a continuous spray is provided across the entire width of the felt.

2. A felt conditioner as set forth in claim 1 including a hood fixed to and overlying said conduits.

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