C. G. SARGENT.

FIBER CLEANING MACHINE.

APPLICATION FILED APR. 24, 1907.

944,507.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.

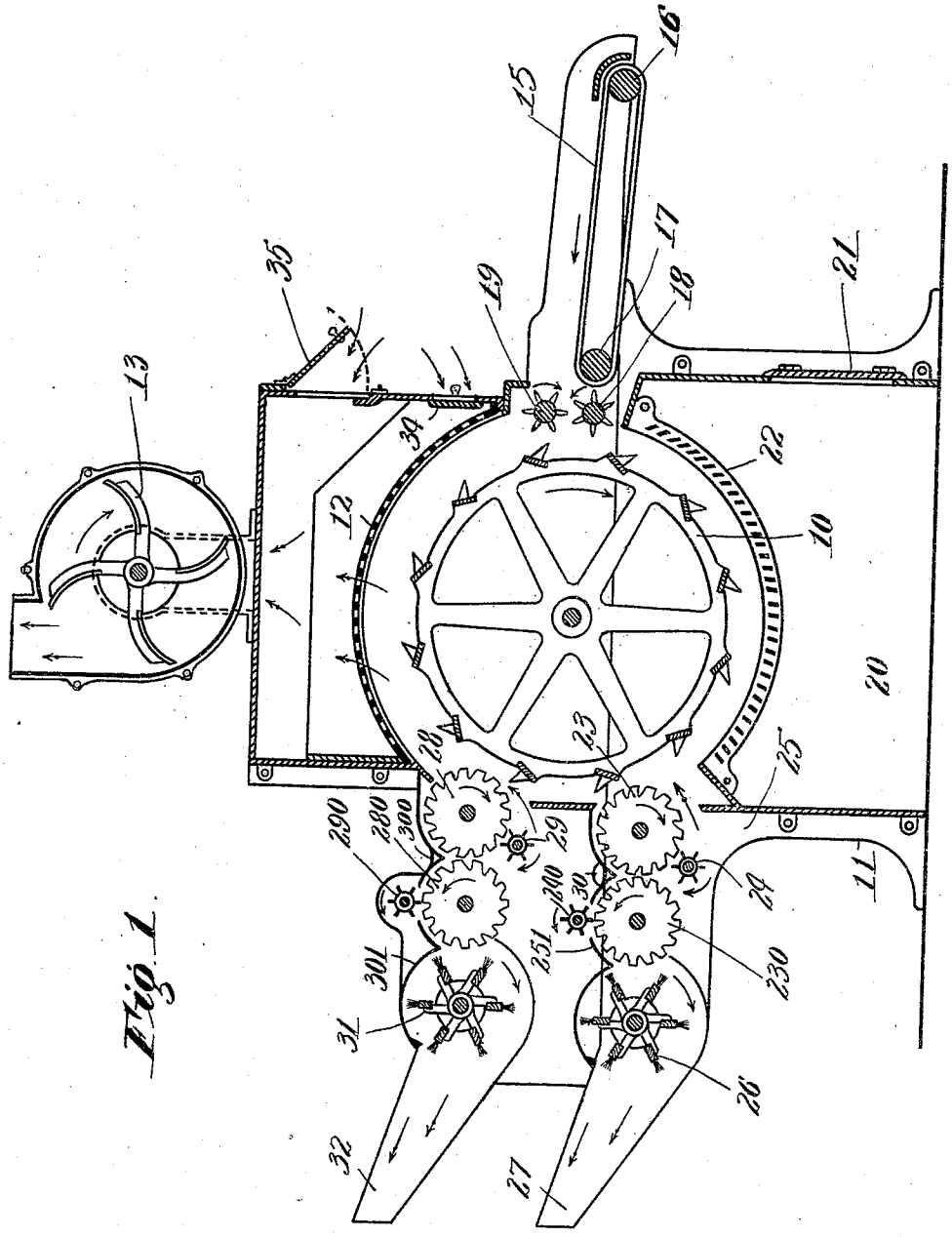

Fig. 1.

Witnesses.

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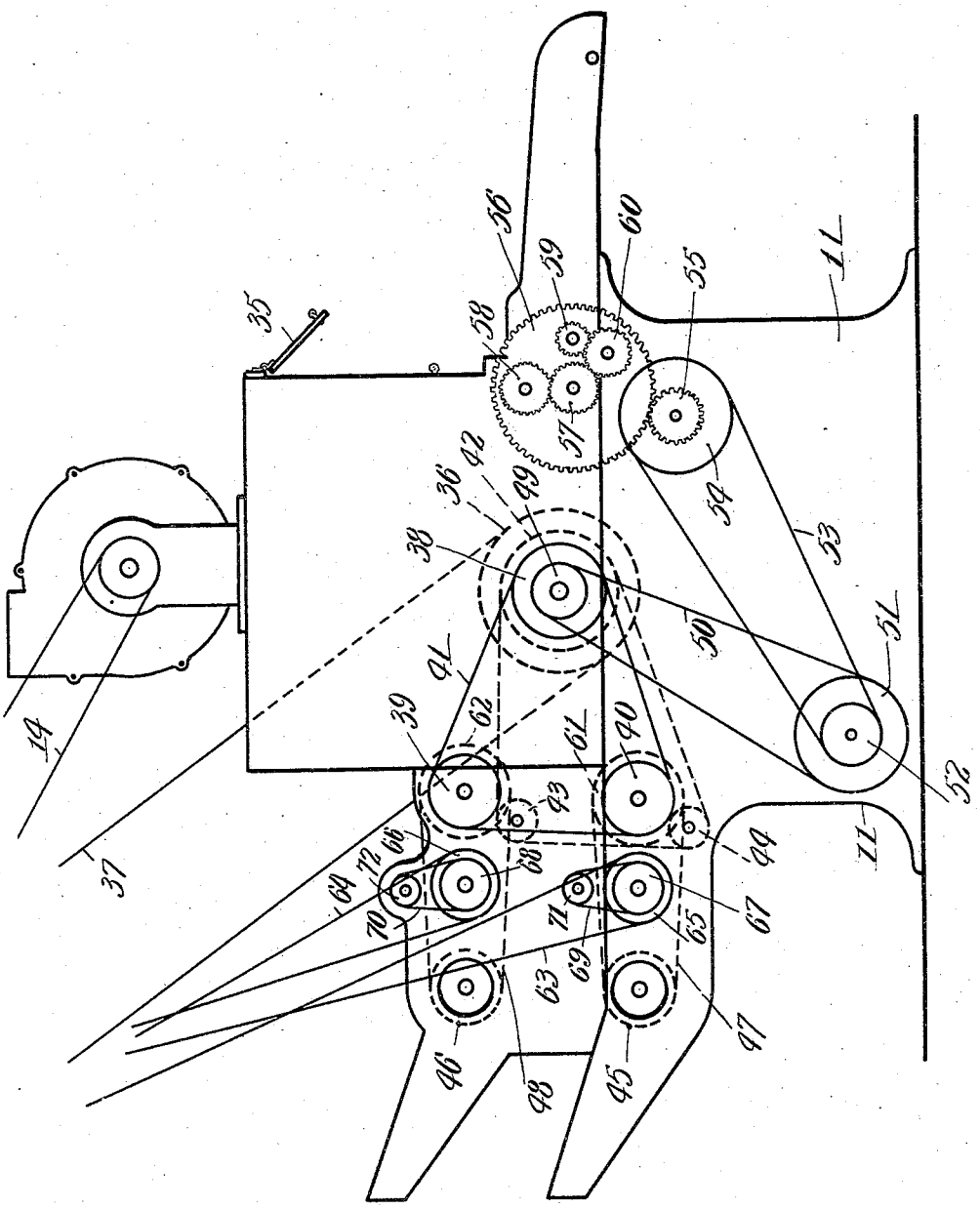

Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES G. SARGENT, OF WESTFORD, MASSACHUSETTS.

FIBER-CLEANING MACHINE.

944,507. Specification of Letters Patent. Patented Dec. 28, 1909.

Application filed April 24, 1907. Serial No. 369,897.

To all whom it may concern:

Be it known that I, CHARLES G. SARGENT, a citizen of the United States, residing at Westford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Fiber-Cleaning Machine, of which the following is a specification.

This invention relates to fiber cleaning machines, and particularly to that style of machine which is used for removing burs and other impurities from wool or cotton which style of machine is commonly termed a "bur picker". This style of machine consists of a revolving main or picking cylinder to which the stock is fed so that it will be combed out thereon to allow the heavier impurities to drop therefrom. The stock is taken from the picking cylinder by a bur-cylinder, usually rotating in opposition to the picking cylinder, and engaging the stock after it passes onto the bur cylinder is a guard which usually is made in the form of a rapidly rotating cylinder having bars or floats, which cylinder is set just to scrape the surface of the stock, and thereby to separate and throw out any burs or other impurities. An air draft is arranged so that as this action takes place any fibers of stock which may be knocked off from the bur cylinder by the guard are sucked back onto the body of the stock in the machine, this current of air being adjusted so as not to be strong enough to suck back onto the main body of the stock the burs or other impurities which are separated by the guard. The treated stock is then taken from the bur cylinder by a brush. Attempts have been made to improve the quality and increase the quantity of work done on these machines by arranging the machines to have two bur cylinders to take the stock from the picking cylinder so as to treat the stock at the two points where it thus leaves the main cylinder. These prior machines, however, have been disadvantageous in operation, because by their constructions the burs or impurities removed by one guard have necessarily been thrown back into the stock and have not been removed therefrom as they should be.

In my United States Patent No. 868,944, granted Oct. 22, 1907, I have illustrated and described a machine of this general character, in which a pair of bur-cylinders are employed, each independently taking stock from the picking cylinder, and each being provided with a separate bur escape arranged to direct the burs away from the picking cylinder. In this case the stock is operated upon by the guard on one side only.

The principal object of the present invention is to provide means whereby the stock can be operated upon twice by guards located on opposite sides thereof, the stock being delivered directly from primary bur-cylinders, such as those disclosed in the above mentioned patent, to secondary bur cylinders, the burs from the guards being delivered independently outside the machine so that there will be no chance of the burs coming back into a position where they may be deposited on the untreated fiber.

This invention preferably is applied to a machine of the character set forth in my above mentioned patent and has a primary set and in addition a secondary set of bur cylinders, each set comprising two or more cylinders.

By the use of a machine constructed in accordance with this invention the quality and quantity of the work is greatly improved and increased, the burs and other impurities being removed at several points, and separated from the stock in a practical and simple way.

The invention will be understood by referring to the accompanying drawings, in which—

Figure 1 is a sectional elevation illustrating a machine constructed to embody my improvement, and Fig. 2 is a diagrammatic view illustrating the arrangement of driving belts and gearing.

Referring to the drawing and in detail, 10 designates the picking cylinder, consisting of a large drum having teeth or spurs on its periphery. A screen 12 is arranged in a casing or frame 11 above the picking cylinder 10. A suction fan 13 is arranged on top of the casing, and is rotated by a belt 14. This fan is arranged to suck out and carry off all light impurities, dust, etc. liberated from the stock as it is being cleaned, and also to perform the function of keeping the stock from escaping with the burs.

The stock is fed to the picking cylinder by means of an apron 15 mounted on rollers 16 and 17 which direct the stock to feed rolls 18 and 19, which are provided with spur teeth to take the stock from the apron and pass the same to the picking cylinder 10. The feed rolls 18 and 19 are sometimes fluted instead of toothed.

The bottom of the casing or frame is made in the form of a box 20 having a door 21, and a rack or series of bars 22 is arranged under the picking cylinder, whereby as the stock is combed out and taken onto the picking cylinder 10, all heavy dirt, etc. will drop down through the rack or screen.

Coöperating with the picking cylinder is a bur cylinder 23 which I will hereafter speak of as the lower bur cylinder. This cylinder is arranged to take part of the stock from the picking cylinder. This bur cylinder is rotated in opposition to the picking cylinder for this purpose. It is provided with a guard 24 preferably made in the form of a rapidly rotating cylinder having floats arranged to beat or strike on one side of the stock or sliver taken from the picking cylinder by the bur cylinder.

As so far described this mechanism is substantially the same as that shown in my above identified patent, except that the guard is preferably located not directly underneath the bur cylinder, but as far up the delivery side thereof as is practicable so that the guard directs the burs and other impurities downwardly.

The casing is cut away where the cylinder 23 is arranged, leaving a bur escape 25 whereby the burs drop to the floor. The casing extends upwardly to a point above the path of the burs delivered from the guard to prevent the burs entering the casing in which the picking cylinder is located. An upper bur cylinder 28 is also arranged to take stock independently from the picking cylinder 10. The bur cylinders 23 and 28 constitute the primary set shown in my prior application. A guard 29 is arranged in connection with the cylinder 28, and the casing is so formed that a bur escape 30 is provided under the cylinder 28 and guard 29, this bur escape being in the form of a trough formed on a partition or wall 251 and opening out of one or both sides of the machine through the frame 11. The guard 29 may conveniently be located in a position with respect to its bur cylinder 23 similar to that of the guard 24 with respect to its bur cylinder 28 and for the same reason. Burs and other impurities may be removed from the several bur escapes by an attendant or in any desired way.

It will be observed that the bur escape 30 comes above the bur cylinder 23 and below the bur cylinder 28.

The guards 24 and 29 operate on one side only of the stock although they remove most of the larger burs. In order to provide for operating on the other side, a secondary set of bur cylinders 230 and 280 is arranged adjacent to the cylinders 23 and 28 and are rotated at a higher speed in the direction of the arrows, so as to take the stock directly from the primary cylinders 23 and 28 respectively.

The secondary bur cylinders are provided with guards 240 and 290 respectively which in this instance are located above their respective bur cylinders so as to deliver the burs, etc., into the bur-escapes 30 and 300 to deliver the burs independently and prevent their coming back into contact with the picking cylinder. Rotating brushes 26 and 31 are arranged to take the stock from the bur cylinders 230 and 280 and pass the same into chutes or stock escapes 27 and 32 respectively.

The casing is provided at its front with the usual draft regulator or register 34 and door 35. By adjusting the register and door the degree of suction exerted by the suction fan 13 at the back of the machine can be adjusted.

It will be noticed that an air inlet is provided through each bur escape 25 and 30, and by the adjustment above mentioned, the flow of air through the same is adjusted. As the air flows in through or over the bur escapes, it necessarily passes through the two layers of stock or fiber passing from the picking cylinder to the primary bur cylinders and thus sucks back any stock fibers knocked off from these bur cylinders by the guards and at the same time, adjustment is made so that the burs or impurities which have a greater specific gravity than the fibers will drop through or into the bur escapes.

By providing bur-escapes to direct the burs and impurities removed by the plurality of guards outside of the machine, the quality of the work is improved, because the fibers are thoroughly opened out and dusted, and there is no possibility of any of the burs or imperfections which are removed being thrown back into the machine, and the quantity of the work is increased because much more stock can be fed to the machine than where a single bur cylinder is used, as each bur cylinder will take its share of stock.

One convenient way for driving the parts is shown in Fig. 2. A pulley 36 is arranged on the shaft of the picking cylinder 10 and is driven by belt 37. A pulley 38 is arranged on the shaft of the picking cylinder, and pulleys 39 and 40 are arranged on the shafts of the primary bur cylinders, and a belt 41 is trained around the three pulleys 38, 39 and 40 to rotate the bur cylinders. Another pulley 42 is arranged on the shaft of the picking cylinder 10, preferably at the opposite side of the machine, and pulleys 43 and 44 are arranged on the shafts of the guard cylinders, whereby the guard cylinders will be rotated. A small pulley 49 is arranged on the shaft of the picking cylinder, and by belt 50 drives a pulley 51 arranged on a stud, which pulley 51 has a pulley 52 turning therewith, which, by means of belt 53 drives a pulley 54 on a stud.

By means of gears 55 and 56 the lower-

feed roll 18 is rotated, and the two feed rolls are geared together by gears 57 and 58.

The front roller 17 of the apron is provided with a gear 59 which meshes with an intermediate 60, which latter meshes with the gear 57 on the lower feed roll 18, whereby the apron is turned at the proper speed.

The mechanism so far described is driven from the pulley 36, or from the shaft of the picker cylinder. The rotary brushes 26 and 31 are also provided with pulleys 45 and 46 which are driven by belts 47 and 48, which are in turn driven by pulleys 61 and 62 on the shafts of the bur cylinders 23 and 28 respectively. The brushes, therefore, are driven indirectly from the shaft of the picker-cylinder.

From the power shaft (not shown) which drives the picker cylinder, cross belts 63 and 64 drive a pair of pulleys 65 and 66 which are of such size that they rotate at a higher speed than the pulleys 39 and 40. These pulleys are mounted on the shafts on which the secondary bur cylinders 230 and 280 are mounted. On the same shafts are a pair of pulleys 67 and 68 which drive belts 69 and 70 passing over pulleys 71 and 72 on the shafts of the guards 240 and 290.

It is within the scope of this invention to use one large rotating brush in place of the brushes 26 and 31 to co-act with the secondary bur cylinders 230 and 280 without interfering with their guards and bur escapes, but the preferred arrangement is to use two rotary brushes. Obviously any desired kind of driving mechanism may be employed to operate the various elements provided they are turned in such a way as to secure the above desired results, without departing from the scope of this invention as expressed in the claims.

Having thus fully described my invention what I claim and desire to secure by Letters Patent is:—

1. In a fiber cleaning machine, the combination with the picking cylinder, a plurality of primary bur cylinders each independently taking stock from the picking cylinder, and a guard for each primary bur cylinder, of a plurality of secondary bur cylinders each entirely out of contact with the picking cylinder and taking stock directly from the surface of one of the primary bur cylinders, whereby they work on opposite surfaces of the stock, a guard for each of said secondary bur cylinders, a separate stock escape for each secondary bur cylinder, means for receiving the burs after the same have been thrown from the stock by said last named guards and preventing the same from passing back into the stock, and means for rotating the secondary bur cylinder at a higher rate of speed than the primary bur cylinders, and in the opposite direction.

2. In a fiber cleaning machine, the combination with the picking cylinder, and two primary bur cylinders arranged one above the other, each independently taking stock from the picking cylinder, of two secondary bur cylinders arranged one above the other, and each in horizontal alinement with one of the primary bur cylinders, and entirely out of contact with the picking cylinder, each taking stock directly from one of the primary bur cylinders, and operating on the other side of the stock, a guard for each bur cylinder, and bur escapes for said guards, one of said bur escapes being below the lower pair of cylinders, one above the upper pair and one between the two pairs of bur cylinders.

3. In a fiber cleaning machine, the combination with the picking cylinder, a plurality of primary bur cylinders each independently taking stock from the picking cylinder, and a guard for each primary bur cylinder, of a plurality of secondary bur cylinders each entirely out of contact with the picking cylinder, and taking stock directly from the surface of one of the primary bur cylinders, whereby they work on opposite surfaces of the stock, a guard for each of said secondary bur cylinders, two brushes, each for taking stock from one of the secondary bur cylinders, and separate stock escapes for the two brushes.

4. In a fiber cleaning machine, the combination with a picking cylinder, of a primary bur cylinder, a second bur cylinder rotating out of contact with the picking cylinder and directly in contact with the first bur cylinder and in the opposite direction, means for rotating the second bur cylinder at a higher rate of speed than the first bur cylinder, whereby it will take stock directly therefrom, and operate on the other side of the stock, a guard for each bur cylinder, bur escapes for said guards, and a rotary brush for taking stock from the second bur cylinder and a stock escape, both bur cylinders, the brush, and stock escape being substantially in a horizontal plane.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

CHAS. G. SARGENT.

Witnesses:
OSBORN H. CILLEY,
WM. F. SARGENT.