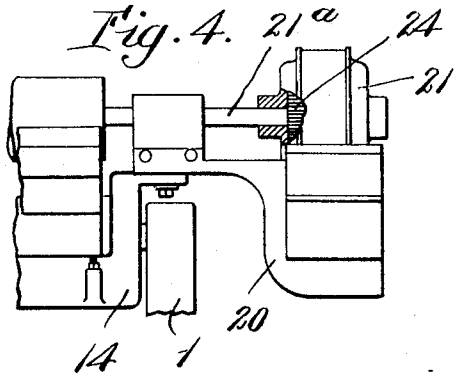
Dec. 11, 1928. 1,694,865

C. G. RICHARDSON

CLOTH FINISHING MACHINE

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Fig. 4.



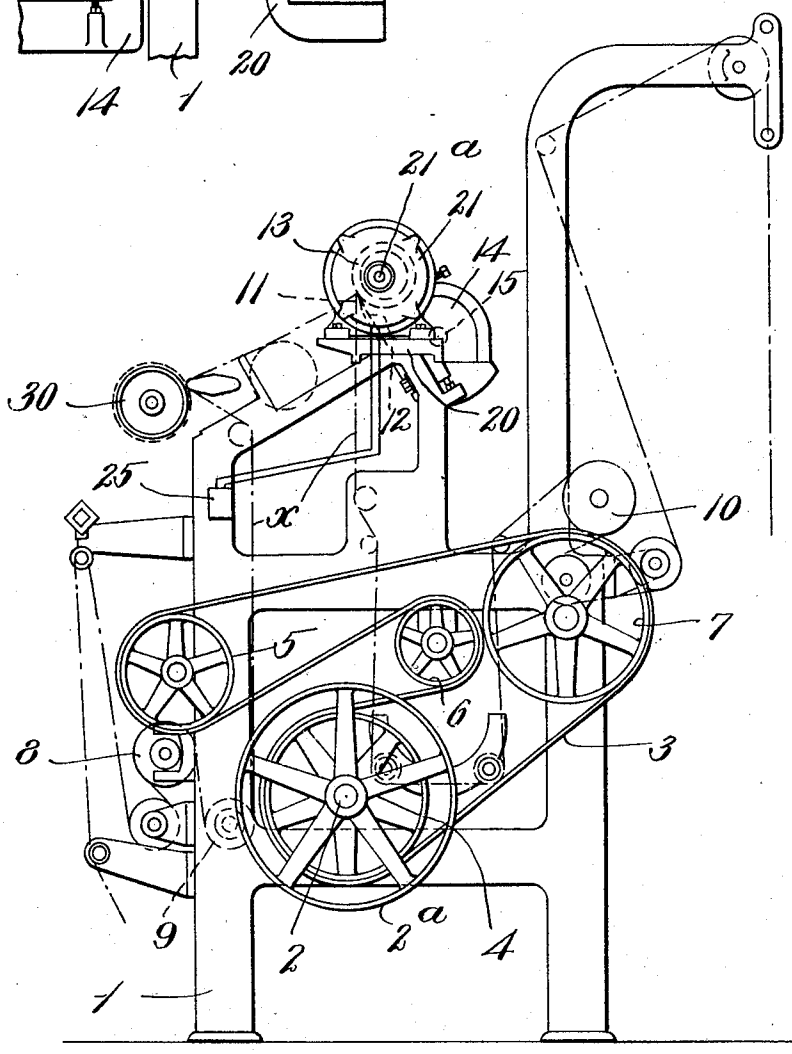


Fig. 1

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Dec. 11, 1928. 1,694,865

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CLOTH FINISHING MACHINE

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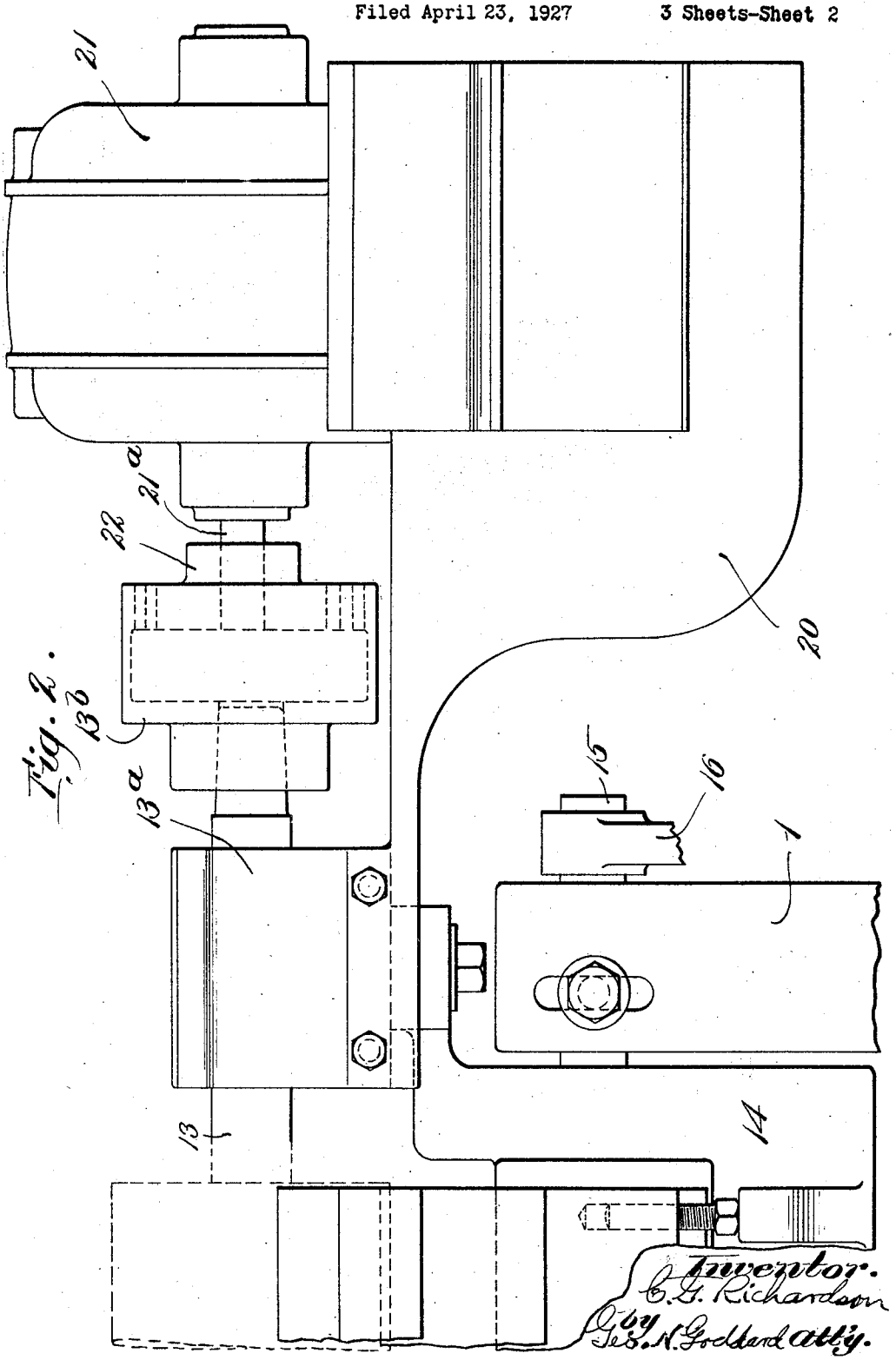


Fig. 2.

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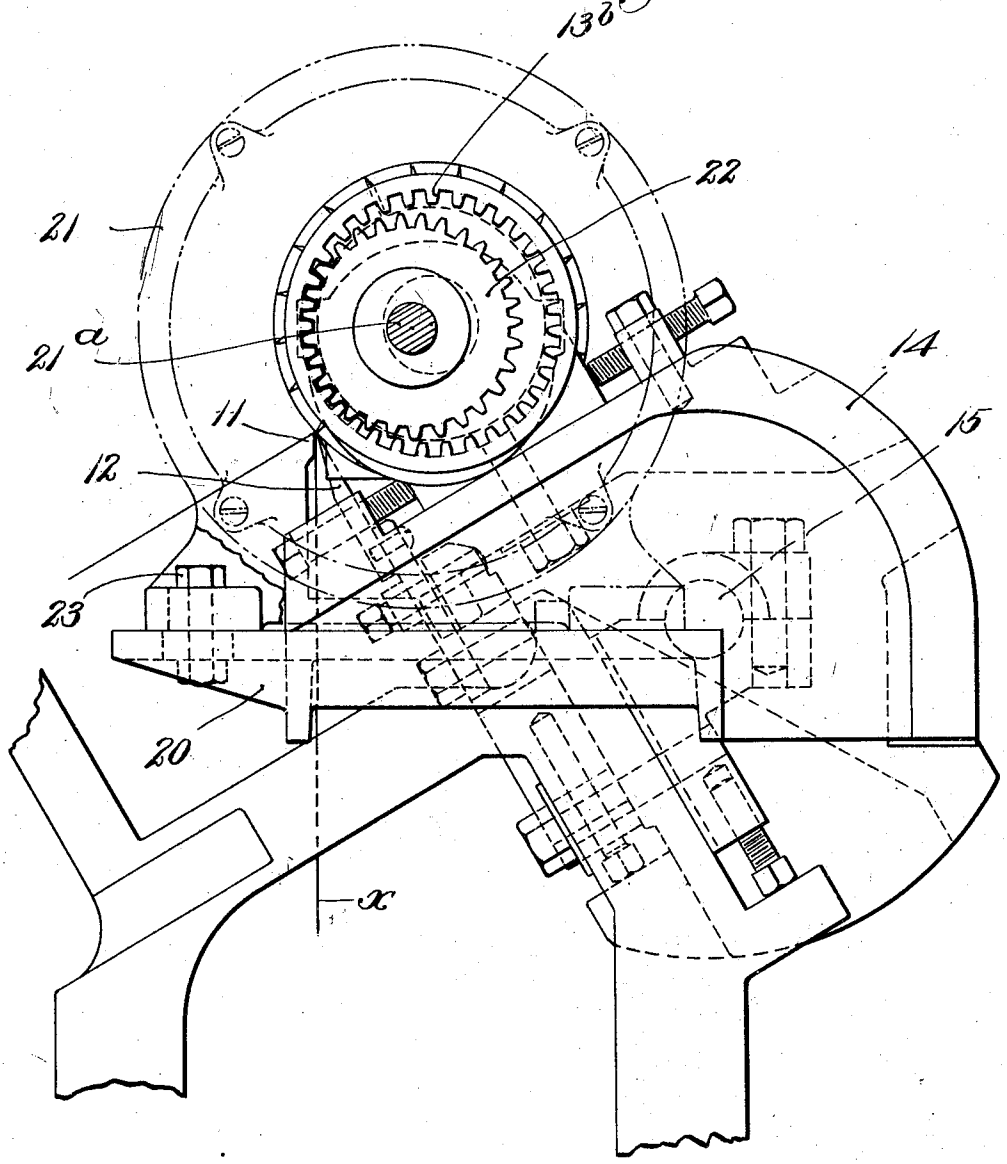
Dec. 11, 1928. 1,694,865

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CLOTH FINISHING MACHINE

Filed April 23, 1927 3 Sheets-Sheet 3

Fig. 3.



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Patented Dec. 11, 1928. 1,694,865

UNITED STATES PATENT OFFICE.

CHARLES G. RICHARDSON, OF SPRINGFIELD, VERMONT, ASSIGNOR TO PARKS & WOOLSON MACHINE COMPANY, OF SPRINGFIELD, VERMONT, A CORPORATION OF VERMONT.

CLOTH-FINISHING MACHINE.

Application filed April 23, 1927. Serial No. 186,010.

Cloth-finishing machines both for shearing the pile and for raising the nap, as heretofore constructed, have been a prolific source of trouble owing to the fact that frequently the sheared or napped piece of cloth, when taken from the machine, would show cross lines or markings where the shearing or nap-raising operations had been imperfectly performed. Such imperfections rendered the cloth less salable and less valuable, but thus far no means for effectively and wholly preventing such imperfections have been devised.

According to long time practice, the fly-blades of cloth-shearing machines and the nap-raising drums or wire cylinders which, for convenience, may be included under the general term "cloth-finishing elements," have been driven by belted connection with the drive shaft of the machine and oftentimes by the same belt that drives the cloth-feeding rolls by which the cloth is drawn through the machine. In the operation of either style of cloth-finishing machine it is frequently necessary to stop the machine and when, in starting up the machine, the cloth-finishing roll or member does not come up to normal operative speed to properly perform its function, until the cloth has traveled some distance from its position of rest, these markings will appear very conspicuously in the cloth. The attempt to overcome these troubles, by providing a belt-tensioning pulley controlled by the operator and by setting the belts very tightly upon the pulleys secured to the end of the cloth-finishing elements, has not been satisfactory because it requires great care and skill and constant attention to properly operate this style of machine, as this is a delicate operation always subject to error, and because such tight belts cause uneven wear in the bearing boxes at the opposite ends of the rotary shear or wire cylinder, thus bringing the axis of the cylinder out of parallelism with the ledger blade and with the cloth-rest, and making it difficult or impossible to do entirely satisfactory work.

My present invention deals with this problem and comprises, generally speaking, a driving mechanism for the cloth-finishing cylinder by which the cloth-finishing cylinder may be brought up to full operative speed before the cloth begins to travel away from its point of rest. This highly desirable improvement is effected by providing for the cloth-finishing element and driving motor that is so far independent of the cloth-feeding driving means that the fly-blade or cylinder may quickly attain its requisite speed for good work before the cloth begins to move at all.

This and other features of the invention will be particularly described in the following specification and will be pointed out in the claims hereto annexed.

In the accompanying drawings I have shown this new principle of driving applied to a well known type of cloth-shear in which the fly-blade is mounted in a pivotal or swinging head upon which is carried the independent driving motor or element which drives the fly-blade at the requisite speed.

In said drawings:

Figure 1 is a side elevation showing so much of a cloth-shearing machine as is necessary to understand my improvement.

Figure 2 is an enlarged detail view showing, in front elevation, the driving connection for the fly-blade shaft.

Figure 3 is a detail view in side elevation showing further details of the driving connection in association with the fly-blade shaft, its pivotal supporting head and the attached ledger blade.

Figure 4 is a detail view showing, in side elevation, an electric motor directly connected with the fly-blade shaft.

The cloth-shear, to which my improvement is shown applied for the sake of illustration, is of the type shown in United States Letters Patent 1,152,048 dated Aug. 31, 1915, and only so much of that shear will be herein described as will be needed to explain how the present driving system is applied thereto and operates in connection therewith, but it will, of course, be understood that the present improvement is applicable to various types of cloth-shearing machine as well as to machines where a rotary wire-clothed drum is used in place of the shearing fly-blade to raise the nap or pile instead of clipping it.

In practice, according to the illustration, the cloth-shearing machine embraces a suitable frame-work 1, provided with a transverse drive-shaft 2 which, by means of a driving belt 3, passing around pulleys 4, 5,

6 and 7, is used to drive the cloth-feeding rolls 8, 9 and 10 by suitable gearing, chain or belt connections usually applied on the opposite side of the machine, but not here shown. The usual cloth-raising and the cloth-laying brushes are also driven from the same source of power. Heretofore it has been the practice to drive the fly-blade shaft by a belt extending from the large pulley 2^a on the drive-shaft 2, to a small pulley on the fly-blade shaft inasmuch as the fly-blade shaft, in order to effectively perform its shearing operation, should run at relatively high speed.

The line of travel of the cloth being treated is indicated by dotted line x in Figure 1. It passes around the initial feed-rolls 8, 9, thence upward, and after being exposed to the raising brush 30, passes over and around the cloth-rest 11 around whose edge it turns and descends at an acute angle so as to expose the pile threads to engagement with the parallel edge of the ledger blade 12, which is properly secured to the swinging or pivotal head 14, supported in trunnions 15, which head carries the bearings 13^a for the rotary fly-blade shaft 13, which carries the usual spiral cutting blades to clip off the ends of the pile threads engaged and supported temporarily by the ledger-blade which forms the other couple of the shear.

Now it will be seen that with the arrangement above described, which is essentially that of all cloth-shears as heretofore made, not only is there great liability of belt slippage on the part of the belt that passes over the small driving pulley on the end of the fly-blade shaft, but as the fly-blade must be repeatedly lifted away from the cloth or cloth-rest in the operation of the machine, such movement is likely to affect the belt tension as the fly-blade is moved to or from operative position. These fly-blades often weigh as much as 250 pounds, and as they must attain high speed before doing effective clipping the cloth-feeding means is likely to become effective to start the travel of the cloth before the fly-blade reaches an effective clipping speed, with the result that that portion of the cloth, immediately approaching the edge of the cloth-rest or the shearing line, is either not acted upon by the fly-blade or is imperfectly clipped. To minimize this trouble it has been customary to set the fly-blade belts under very tight tension and while this tends, in a measure, to lessen the trouble, the effect is to cause the bearing-box at the driving end of the fly-blade to wear excessively so that the blade gets out of proper alignment relation to the ledger-blade and to the cloth-rest so that it becomes very difficult to properly set the machine.

By my present improvement both these faults are avoided by providing the fly-blade shaft with an independent drive which makes it easy to bring the fly-blade promptly up to speed without starting the cloth-feeding means until such speed is obtained.

To this end, to the driving end of the fly-blade shaft I secure, in one form of the invention, an internal gear 13^b and provide the pivotal shearing head 14 with an extension bracket 20, so proportioned and arranged as to form a support for a motor 21, which is secured in proper position on said extension bracket 20 so that a spur-gear 22, secured to the end of the motor-shaft 21^a will intermesh with the internal gearing of the fly-blade driving gear 13^b.

By offsetting the axis of the motor with relation to the axis of the fly-blade shaft, according to the difference in radial measurements of the internal gear and of the spur gear, which difference need not be very considerable, I secure not only a very easy intermeshing of the gears but provide an arrangement in which all the gearing is enclosed, and one in which the fly-blade may be driven at nearly the same speed as the motor-shaft. A controlling switch 25, located conveniently for the attendant, enables him to start the fly-blade before the shipping lever, which controls the drive-shaft of the machine, is thrown to operative position to start feeding the cloth. By providing an independent motor drive for the fly-blade that does not involve the simultaneous starting of the cloth-feeding and other related mechanism, even an unskilled operator can operate one of these machines without danger of causing the objectionable cross lines and markings of the nap, which means loss or waste in the product.

By utilizing the gear-drive connection it is possible to apply this independent drive principle to all sorts of existing shearing machines or to napping or tigering machines employing a wire-clothed drum instead of the fly-blade.

It will, of course, be obvious that a smaller or a larger spur gear on the motor-shaft may be substituted to secure the desired speed without change of motor, in such case it being necessary to merely vary the eccentricity of the motor-shaft in relation to the fly-blade shaft by the adjustable bolt connection 23 to compensate for the change in gearing.

On the other hand, the armature 24 of the motor may be secured directly to the fly-blade shaft, as indicated in Figure 4, in which case, of course, the motor will be mounted in coaxial alignment with the fly-blade shaft.

By means of the independent motor drive for the fly-blade shaft, not only will the objectionable marking of the fabric be elim-

inated, but the uneven wear of the bearing boxes, which results in getting the fly-blade out of alignment with the related parts of the mechanism, is avoided as well as the excessive vibration often found in the high speed fly-blade shaft.

What I claim is:

1. In a cloth-finishing machine, the combination with cloth-guiding and cloth-feeding means, of a pivotal head, a rotary finishing element mounted in said head to permit its movement toward and away from the cloth-guiding means, a driving motor carried by said head and having driving connection with the rotary finishing element, and means for controlling the starting and stopping of said motor independently of the cloth-feeding mechanism.

2. In a cloth-finishing machine, the combination with a cloth-supporting and guiding rest, means controlled by the operator for feeding the cloth over said rest, a pivotal head, a cloth-engaging and finishing element rotatably mounted in said head and adjustable toward and away from the cloth-rest by the pivotal movement of said head, a driving motor mounted on and movable with said head, said motor having operative driving connection with said rotatable finishing element and being under independent control of the operator whereby the finishing element may be brought to proper operative speed before the cloth starts to move.

3. In a cloth-finishing machine, the combination with a cloth-rest, a pivotal head mounted in juxtaposition to said cloth-rest, a ledger blade secured to said head for movement therewith toward and away from the cloth-rest, a rotary fly-blade mounted in bearings carried by said pivotal head and a fly-blade driving motor also mounted on said head to move in unison with the fly-blade, means for feeding the cloth between the cloth-rest and the fly-blade, and means controlling the starting of the fly-blade in action through said motor while the cloth remains at rest.

4. In a cloth-finishing machine, the combination with a cloth-rest and a pivotal supporting head extending across the machine, cooperating ledger and fly-blades mounted on said head to be moved thereby into shearing relation to the cloth-rest, means for feeding the cloth over the cloth-rest, independently controlled means mounted on the cloth-rest to rotate the fly-blade, whereby the fly-blade may be brought to operative speed before setting in action the cloth-feeding means.

5. In a cloth-finishing machine, the combination with cloth-feeding means and a cloth-supporting rest, of an adjacent pivotal head, a rotary cloth-engaging and finishing element mounted in said head to be movable therewith, an electric motor mounted on said head eccentrically of the axis of the cloth-finishing element, said motor and said finishing element being interconnected by internal gear connection.

In witness whereof, I have subscribed the above specification.

CHARLES G. RICHARDSON.