(No Model.)

E. V. BATES.

CARDING MACHINERY.

No. 444,720. Patented Jan. 13, 1891.

Fig. 2.

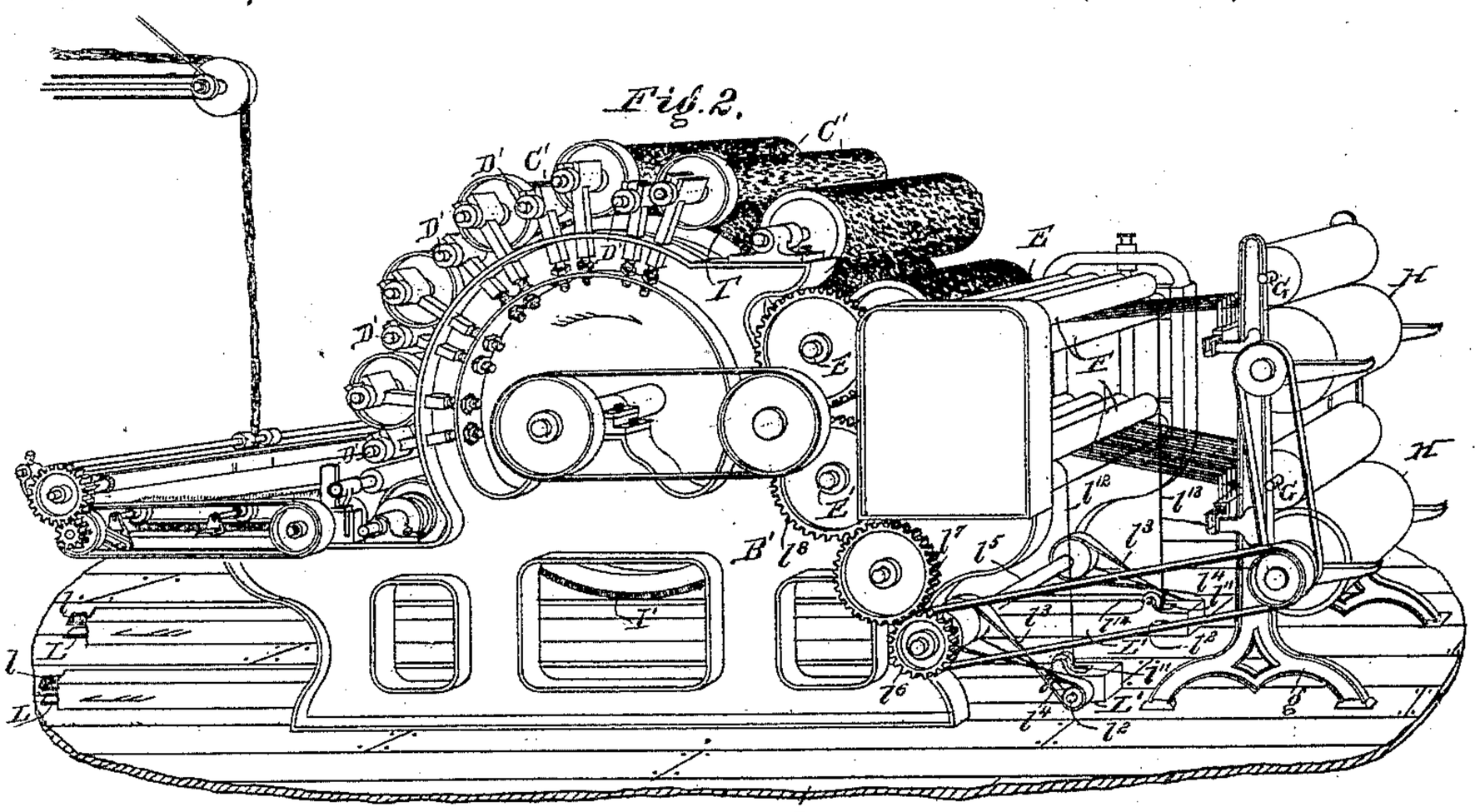


Fig. 3.

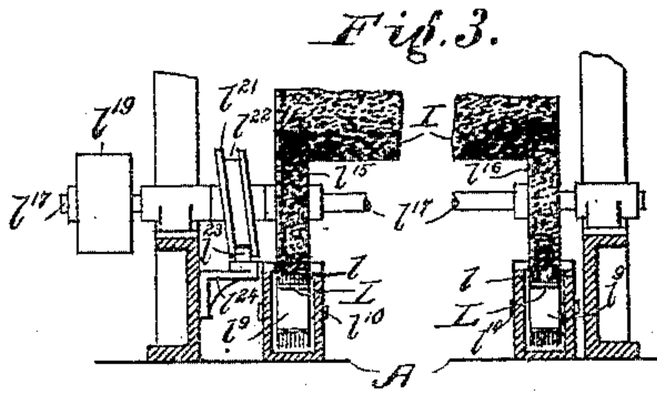
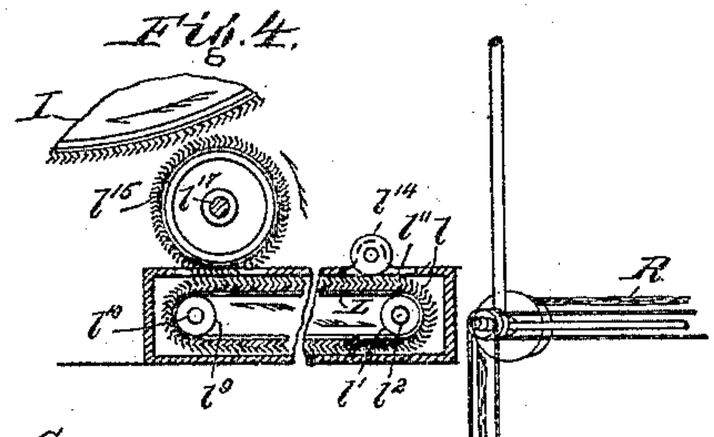
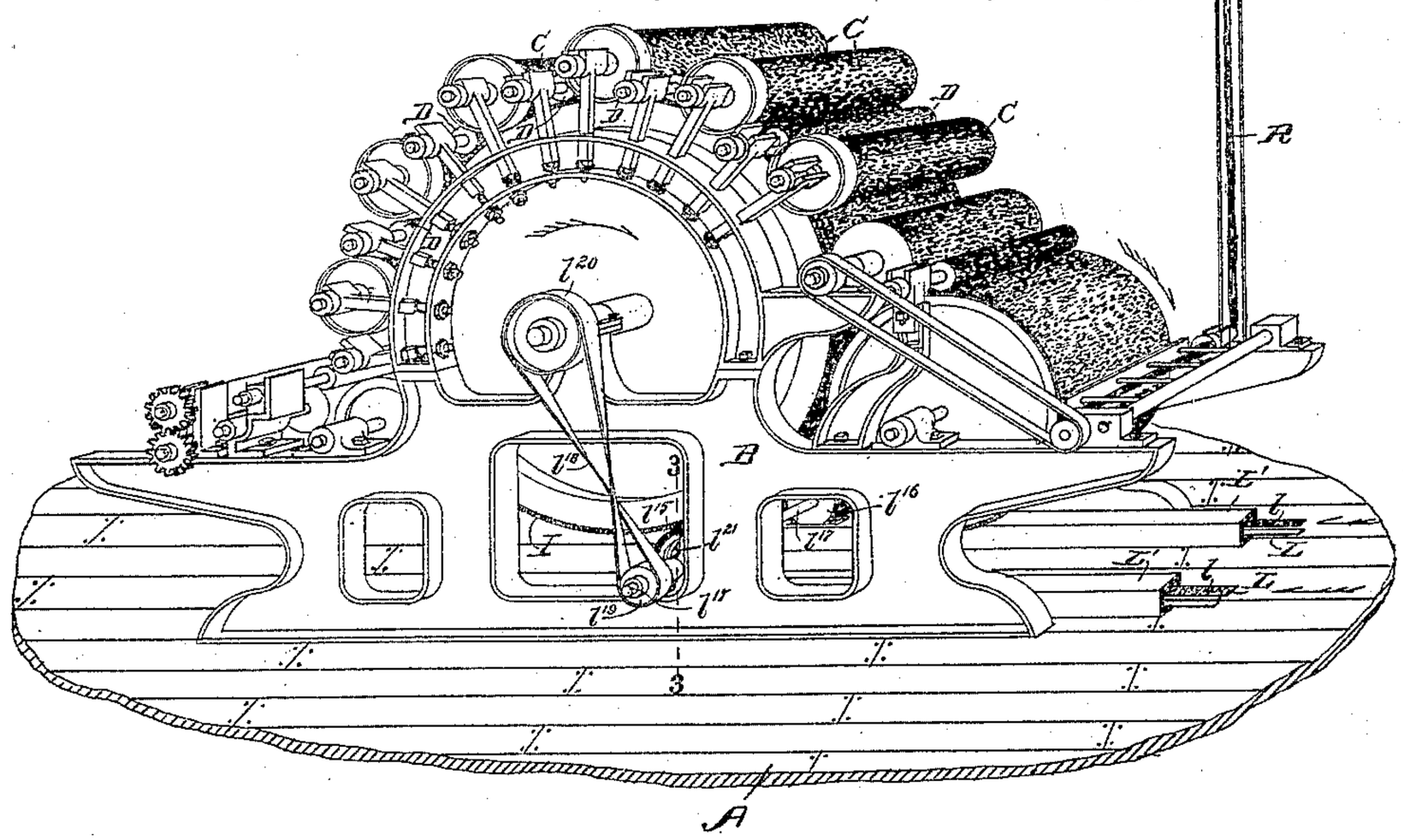


Fig. 1.

Fig. 4.





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UNITED STATES PATENT OFFICE.

EDDO V. BATES, OF DRACUT, MASSACHUSETTS.

CARDING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 444,720, dated January 13, 1891.

Application filed December 28, 1889. Serial No. 335,207. (No model.)

To all whom it may concern:

Be it known that I, EDDO VASCO BATES, a citizen of the United States, residing at Dracut, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Carding Machinery, of which the following is a specification.

My invention relates to carding machinery; and it consists in means hereinafter described and claimed of conveying the waste slivers from a finisher-card or carding-engine to another carding-engine which precedes said finisher-card in operation upon the fibers.

Figure 1 represents what is commonly known in the business of woolen manufacturing as a "breaker-card," and Fig. 2 what is known as a "finisher-card," these figures being perspective views. Fig. 3 is a section of the conveyers and a part of the frame on the line 3 3 in Fig. 1, showing in elevation the rolls which strip the conveyers and a part of the main cylinder, a part of said cylinder and the shaft of the conveyer-stripper being broken away. Fig. 4 is a side elevation of a part of the main cylinder of the breaker-card, one of the conveyer-strippers, and a longitudinal section of the conveyer-belt and the box or conduit in which the same travels.

A is the floor of a carding-room in a factory; B, the frame of the breaker or breaker-card; B′, the frame of the finisher-card; C C′, the workers of said cards, respectively; D D′, the strippers of said cards, respectively; E E′, respectively the upper doffer and the lower doffer of the finisher-card; F, the delivery rolls or rubbers between which the roving passes from the finisher-card to the spools G, the latter being rotated by the frictional contact of said spools or their contents on the drums H.

The carding-engines or cards represented are of the usual construction and operation as used in the manufacture of woolen cloth, and the finisher-card is provided with a so-called "Apperly feed," substantially as shown in United States Letters Patent No. 18,888, granted December 22, 1857, to James Apperly and William Crissold, except that said Apperly feed is represented in connection with an overhead delivery, as the same is now commonly used, instead of the floor delivery represented in said patent, said Apperly feed consisting, essentially, of appliances which deliver the drawing R from the breaker to the feed-apron of the finisher-card by a diagonal motion in such a manner as to form a sheet or continuous lap of fibers. The Apperly feed, however, is well understood, and, forming no part of my invention, needs no further description, it being sufficient to say that the sheet or lap thus formed is passed through the card in the usual manner and doffed from the main cylinder in such a manner as to form a series of smaller slivers, which by the action of the rubbers are condensed into a spongy roving, and are then wound upon the spools G, which spools are then taken to the spinning jack or mule. The effect of the doubling of the drawing by means of the Apperly feed upon the feed-apron of the finisher-card is such as to make a greater deposit of fibers upon the main cylinder near the edges of said cylinder, and thus to make the outer slivers as they come from the doffer of the finisher-card heavier than the intermediate slivers. It is therefore customary to allow the outer sliver at each side of the finisher-card to run upon the floor or wind it upon a narrow spool, rotating with the drums which give motion to the spools G, which receive the other slivers, and subsequently to reintroduce said slivers into the breaker-card, so that the fibers which form the waste slivers are recarded, and thereby overcarded, the recarding having a tendency to break the fibers or shorten the staple. Furthermore, where the waste slivers are allowed to accumulate on the floor or on the waste-sliver rolls they are fed to the breaker-card in considerable quantities at intervals in such a manner as to interfere with the uniformity of the quality of the product. It is obviously desirable to avoid the labor required in feeding the waste slivers to the breaker, and it is also desirable that such waste slivers should be continually fed to the breaker-card, in order to secure a uniform staple in the good slivers.

The finisher-card is commonly arranged in the rear of the breaker-card, and I arrange below the cards, near their frames, in the same vertical planes with the waste slivers, immediately below the portions of the main cylinders from which said waste slivers are taken,

and to which they are returned, as hereinafter described, conveyers, each consisting of an endless belt L, provided with card-teeth l, which are bent or hooked in the direction in which such belt travels, each belt running upon a roll l', fast on a shaft l^2, arranged parallel with the shaft of the main cylinder I between the lower doffer E′ of the finisher-card and the spool-stand g, each shaft l^2 being driven by belts l^3, connecting pulleys l^4, fast on said shafts, with a counter-shaft l^5, turning in suitable journal-boxes in the frame of said finisher-card, and provided at one end with a gear l^6, engaging an intermediate gear l^7, said intermediate gear l^7 engaging a gear l^8, fast on the shaft of the second or lower doffer E′ of the finisher-card. The conveyers L are also supported below the cylinder of the breaker-card upon pulleys l^9, fast on shafts l^{10}, arranged parallel with the shafts l^2, the shafts l^2 and l^{10} turning in suitable journals in conduits or boxes L′, which inclose said conveyer.

The boxes L′ are mainly to prevent flyings and waste from getting onto the conveyers.

The reason why the card-teeth l of the conveyer L are bent forward, or in the direction in which they travel, is to prevent the fibers of the waste slivers not removed from the conveyer from accumulating in the box L′ below the conveyer and at the closed end of said box below the rub-rolls F, and thus preventing the movement of the conveyer. The finisher is frequently stopped before the breaker, and in that case the drawing R will accumulate on the floor between the cards, and if the finisher is again started while the breaker is at rest, which also happens frequently, the conveyer will run and carry the waste slivers to the breaker; but the conveyer-stripper, being run from the breaker, is also at rest, and if the teeth of the conveyer pointed in the opposite direction said waste slivers would accumulate in the conveyer-box and stop the conveyer; but when the teeth are hooked in the direction shown the waste slivers are carried past the conveyer-stripper repeatedly, and the conveyer being of considerable length, at least thirty feet in length, the conveyer may run for a number of minutes—say ten to fifteen—without clogging the conveyer-box, and the teeth of the conveyer when bent, as above described, will remove any accumulation of fibers from the conveyer-box.

The boxes are each provided with an opening l^{11} to receive a waste sliver l^{12} l^{13}, which falls vertically by its own weight and is guided by a guide-roll l^{14} into said opening, the conveyer at one side of the finisher-card taking a waste sliver l^{12} from the lower rubbers and the other conveyer taking a waste sliver l^{13} from the upper rubbers. The waste slivers are carried by the conveyers under the cylinder I′ of the finisher-card and under the cylinder I of the breaker-card near the outer edges of the said cylinders, and are raised from said conveyer by conveyer-strippers l^{15} l^{16}, the same being narrow cylinders covered with card-clothing and fast on a shaft l^{17}, which is supported in journals in the frame of the breaker-card transversely below the main cylinder I thereof, the shaft l^{17} being driven by a crossed belt l^{18}, which connects a pulley l^{19}, fast on said last-named shaft, to another pulley l^{20}, fast on the shaft of said cylinder I, so that the adjacent surface of said main cylinder I and said conveyer-strippers run with each other, the teeth of said conveyer-strippers hooking in the direction in which they travel, as shown in Fig. 4. The surfaces of the conveyer-strippers are arranged as near as possible to the conveyers and breaker-cylinder without touching the same. To distribute the waste slivers more evenly upon the main cylinder I, the shaft of the conveyer-strippers is given a longitudinal reciprocating motion by means of a cam l^{21}, fast on said shaft, and provided with a cam-groove l^{22} and a stud l^{23}, which projects upward from a bracket l^{24}, rigidly secured to the frame B, and enters said cam-groove. It will be understood that the surface of the main cylinder travels much faster—say about ten times faster—than the conveyer-strippers to enable said cylinder to strip said conveyer-strippers.

I claim as my invention—

The combination of the finisher-card, the breaker-card, conveyers, each consisting of an endless belt of card-clothing and adapted to receive a waste sliver from said finisher-card and to carry the same to said breaker-card, and boxes, each inclosing one of said conveyers except at the points where said waste slivers are received and discharged by said conveyers, the teeth of each conveyer being hooked in the direction in which such conveyer travels to prevent the accumulation of fibers in said boxes and the clogging of said conveyers, as and for the purpose specified.

In witness whereof I have signed this specification, in the presence of two attesting witnesses, this 23d day of December, A. D. 1889.

EDDO V. BATES.

Witnesses:

ALBERT M. MOORE,

MYRTIE C. BEALS.