H. C. PERHAM.

CONDENSER LAP MACHINE.

APPLICATION FILED AUG. 19, 1908.

1,034,829. **Patented Aug. 6, 1912.**

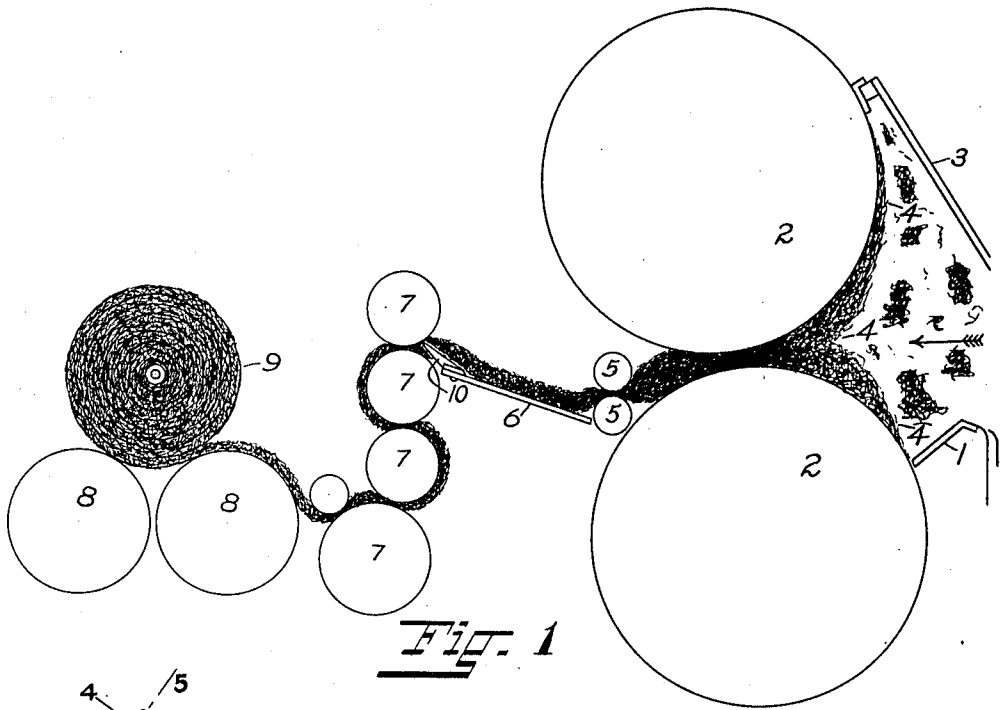

Fig. 1

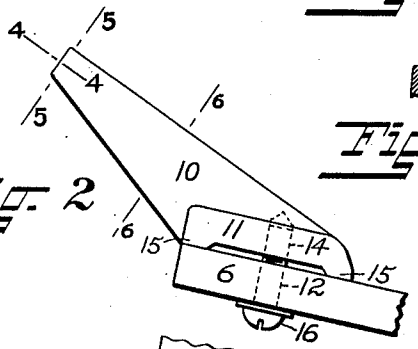

Fig. 2

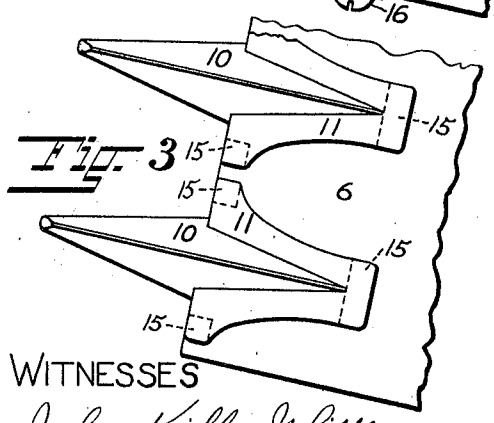

Fig. 3

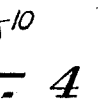

Fig. 4

Fig. 5

Fig. 6

WITNESSES

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CONDENSER-LAP MACHINE.

1,034,829. Specification of Letters Patent. Patented Aug. 6, 1912.

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To all whom it may concern:

Be it known that I, HAVEN COOK PERHAM, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Condenser-Lap Machines, of which the following description, with the accompanying drawings, is a specification.

Like letters on the drawings denote like parts.

This invention is an improvement in condenser-lap machines and particularly in means for preventing the splitting of laps as they unroll upon the aprons of succeeding machines, such as other condenser-lap machines and carding-engines.

It relates to improvements in means for advancing-and-compacting the fibrous material in combination with fiber-rearranging means whereby certain fibers are intermixed and interwoven with other fibers before the lap is rolled and the splitting of the lap thereafter prevented. Its objects are: first, to provide a more efficient form for the forward-terminal portion of the fiber-rearranging means; second, to arrange the said portion and, especially, its fiber-rearranging elements in more efficient relation to the fiber advancing-and-compacting surfaces with which they co-act; third, to improve the means for the attachment of the fiber-rearranging means; and, fourth, to provide attachments for condenser-lap machines such as can be manufactured and sold independently of the said machines and applied thereto in a mill that is far from any well-equipped machine shop and which comprise fiber-rearranging means. These objects are attained by the mechanism that is illustrated in the accompanying drawing, in which:

Figure 1 is a diagrammatic representation of a portion of a condenser-lap machine. Fig. 2 is a side elevation of draw-plate and teeth. Fig. 3 is a plan view of a portion of Fig. 2. Figs. 4, 5, and 6 are cross-sections on lines 4—4, 5—5, 6—6, respectively, of Fig. 2.

In Fig. 1, 1 represents the forward end of a "trough-bottom" that is more specifically called a "screen" or a "grid." It is the bottom of the "trough" or "trunk," through which the lap-forming-materials pass to the "condenser-cages" 2 2. The "trunk-cover" is represented by 3. The arrow in the trunk indicates the general direction of the motion of such materials. The typical shape of the surface of the previously deposited mass of such materials is represented in cross-section, by the line 4 4 4, although the actual shape of such cross-section varies considerably from time to time. Within the trunk and approaching the surface represented by 4 4 4 are shown flying tufts or fragments of such materials. Ordinarily, the parts of such tufts adhere together better than such whole tufts or fragments adhere to one another. As such materials pass the draw-rolls 5 5 over the draw-plate 6 they are called a "sheet." The sheet is compacted by the calender-rolls 7 7 7 7, and finally is wound by the winding-drums 8 8 into a lap 9.

The surface represented by 4 4 4 is one of comparatively easy splitting. In the sheet, it becomes substantially V-shaped with its angle in advance and near the center of the sheet and with its other extremities in the surfaces of the sheet. In the lap, the outer surface splits more easily than the inner one. Laps that contain much waste composed of tufts of straight parallel fibers, split very easily between or through such tufts and easily fall apart. By my invention, I disarrange such parallelism and confusedly intermix and interweave fibers of different tufts by dragging forward some fibers or parts of fibers and by detaining others or parts of others. I prefer that such rearrangement of the fibers shall occur throughout the thickness of the lap, that it shall be most effective in a series of narrow and parallel strips of the sheet, and, especially so, in the outside surface of the rolled lap. I make this rearrangement more permanent by severely compacting the materials immediately after the rearrangement and before the stresses that have been produced during the rearrangement within the elastic mass of

the materials have had opportunity to return the rearranged fibers to their original positions to any important extent.

In my improvements I utilize any usual co-acting fiber-advancing-and-compacting surfaces preferably the surfaces of the upper pair of calender-rolls. I particularly utilize the parts of such surfaces where they bite the materials and another part of the surface of one of them, preferably the lower surface of the upper calender-roll. Preferably, I oppose to the said lower surface a series of stationary teeth or projections situated but a short distance apart in a line parallel to the axes of the calender-rolls and extending entirely across the machine.

I prefer that the teeth shall project from the draw-plate 6, although they may project from the screen 1, or, other support. The teeth fastened to their support may constitute an attachment to be manufactured and sold separately from the machine. Preferably, I fasten each tooth directly to the forward end of the draw-plate separately from and independently of any other tooth. Each separate tooth may constitute an attachment to be made and sold separately from the machine and from the draw-plate or other support.

In Figs. 1, 2, 3, 4, 5, and 6 there is represented a form of inflexible tooth 10 which I prefer to use in old condenser-lap machines which operate upon a comparatively homogenous mass of lap-forming-materials and especially when such machines are situated at a considerable distance from any well equipped machine shop. The trough-bottom 1 or 6 of such machines can easily be removed from the machines and a series of small holes 12 drilled therein. Preferably, to give greater stability to the tooth at its joint with the draw-plate 6, I spread the base of each such tooth and put three feet 15, 15, 15 thereunder. Any unevenness which may exist in the surface of the draw-plate between the feet will be skipped by them, and if necessary, the feet can be readily filed to adapt the teeth to other irregularities. Preferably I drill and tap a hole 14 in the base of each such tooth to receive the fastening screw 16, but other means for fastening the tooth to the trough-bottom or to the draw-plate 6 may be used without departing from my invention. One such preferred tooth is substantially straight and of substantially triangular cross-section from its base to its forward end-surface. It has a narrow straight back having a direction that makes a large acute angle with the lower surface of the upper calender-roll at its intersection therewith. It has two plane sides that substantially intersect the back. It has a plane surface which substantially intersects the two sides and is substantially opposite to the back. It has a plane end-surface located in close proximity to the lower surface of the upper calender-roll and near to the bite of the calender-rolls, which end-surface is substantially at right angles with the back, intersects the sides in sharp fiber-rearranging edges, and intersects the back in a fiber-rearranging apex. Such individual teeth, each having a separate base can readily be cast and manufactured and sold independently of the machine or draw-plate to which they are to be applied. They can be shipped to any manufactory and old condenser-lap machines will be greatly increased in efficiency by their incorporation therein.

I prefer to apply my hereinbefore described invention for preventing the splitting of laps to every breaker, intermediate, and finisher lapper. If the lap splits when unrolling in an intermediate or a finisher lapper or in a carding-engine, the split-off portion adheres to the outer surface of the next inner coil of the lap. The operative must, as soon as possible and as far as he can, rectify this defect in the unwinding. Otherwise, the splitting and the adhesion may continue while the splitting lap makes several rotations about its own axis. The split may tear through the sheet. It may tear across the width of the sheet. By my invention the operative is relieved from the necessity of closely watching the unrolling laps, from the work of rectifying as far as he can the defects due to splitting and from throwing parts of the split laps into the waste to be worked over, and the waste is prevented. In other words, the cost of production is diminished by the use of my invention. The transference of a split-off portion of the lap from the part of the sheet where it belongs to a different part of the sheet tends to non-uniformity in the weight per unit of length of the product from the machine. In the usual intermediate and in the usual finisher lapper an evener is provided and the evener tends to correct such non-uniformity, but it will not perfectly correct it. In the usual carding-engine there is no evener mechanism and the resulting non-uniformity of the product is more serious. When my invention is used the laps do not slip and non-uniformity consequent upon lap-splitting does not occur.

I claim:

An attachment for the draw-plate of a condenser-lap machine comprising in combination therewith, a fiber-rearranging tooth having a forward-terminal portion: substantially straight and of substantially triangular cross-section; having a narrow straight back for location in a direction that will make a large acute angle with the lower surface of the upper calender-roll at its in-

tersection therewith; having two plane sides which substantially intersect in the back; having a plane surface which substantially intersects the two sides and is substantially opposite to the back; and having a plane-end-surface for location in close proximity to the lower surface of the upper calender-roll and near to the bite of the calender-rolls which end-surface is substantially at right angles with the back, which intersects the sides in sharp fiber-rearranging edges, and which intersects the back in an apex.

In testimony whereof, I affix my signature in the presence of two witnesses.

HAVEN COOK PERHAM.

Witnesses:

CHANNING WHITAKER,

IRVING D. KIMBALL.