R. PATTERSON.

Hemp and Flax Brake.

No. 6,958. Patented Dec. 18, 1849.

Fig. 2.

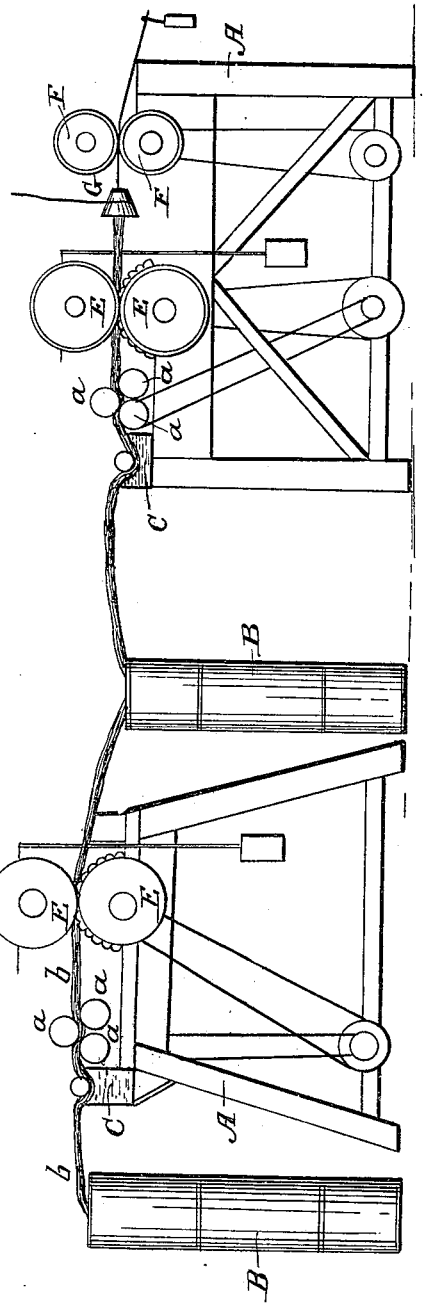

Fig. 1.

Fig. 3.

UNITED STATES PATENT OFFICE.

ROBT. PATTERSON, OF NEW HARTFORD, NEW YORK.

IMPROVEMENT IN THE MANUFACTURE OF FLAX AND HEMP.

Specification forming part of Letters Patent No. **6,958**, dated December 18, 1849.

To all whom it may concern:

Be it known that I, ROBERT PATTERSON, of New Hartford, in the county of Oneida and State of New York, have invented a new and useful Improvement in Manufacturing Flax and Hemp; and I do hereby declare that the following is a full, clear, and exact description thereof.

The nature of my invention consists in treating what is called the "lap" with an alkaline solution, then washing it in water, and afterward drawing it in a wet state in the common cotton-drawing frame, upon the same principle as drawing cotton, in order to draw a finer thread from the lap than can be done by the common dry process of drawing, and to prevent the making of so much tow as is now made by the common process.

To enable others to comprehend my invention, it is necessary to allude to the flax or hemp in its state as it comes from the scutcher, which, as is well known, has the appearance of fibers the full length of the stalk upon which it grows. The best flax is generally allowed to be that kind which is broad, flat, and of a ribbon form, as such flax yields more than any other flax in the hatcheling process, the which process all flax and hemp are subjected to before they are spun in the present mode of manufacturing; and for fine flax-yarn all flax has to be put through a number of machines of coarse and fine hatcheling, each finer than the other preceding, to split the fibers of the flax and separate the broken fibers or tow from the good fibers. In passing through the hatcheling process for reducing the fibers, it is generally allowed to be good flax that will yield fifty per cent. of good fibers, the residue being tow. By the present method of manufacturing flax, after being prepared by the hatchel, it is then spread upon the hatchel gill-frame and made into slivers, preparatory to spinning it into yarns or thread, and after it is spun it goes through several operations to remove the gluten, oil, and dirt. When an ordinary fiber of flax is examined with the microscope, it presents the appearance and is found to consist of very minute fibers of from one to two inches in length lapped one upon the other and adhering together by the natural gluten in the flax, each end of these minute fibers tapering down to he finest imaginable point.

My process is to take the flax as it comes from the scutcher, and then draw it through a coarse hatchel to remove the loose tow and shives and to straighten the fibers. I then spread it in small strakes upon an endless apron or the hatchel spreading-frame, lapping each strake about half its length on the other and running them between two smooth rollers, which press them compactly together, forming a lap, which is received from the pressing-rollers into a can. I then take the can, with the lap in it, and fill it with an alkaline solution of potash or soda. The lap should be kept in this solution in a hot state, fully immersed, for a few hours. This process softens the gluten of the flax which holds the minute fibers together, and qualifies the said fibers to separate from one another, and at the same time the alkali acts upon any vegetable oil and dirt that may be in the flax and resolves them into a liquor soluble in water, to which it is afterward submitted after having poured off the alkaline solution. The lap being thus washed in water, it is then in a fit state for the next operation—viz., the drawing-frame, which is operated exactly upon the same principle as cotton-drawing, excepting that the flax lap is drawn wet and the cotton dry; and to keep the flax lap soft and to prevent it from lapping round the rollers I make the lap to pass from the can through a trough of hot water into the drawing-rollers, from which it is received into a can, and then drawn, doubled, and redrawn through other drawing-heads upon the same principle as cotton is drawn to obtain a roving or sliver sufficiently even and of the requisite size for the thread I wish to produce. The flax lap having been doubled sufficiently to suit the purpose stated, I then run it, still wet, through a counter-twist speeder or other roping-frame onto spools, the same as cotton-roping, from which it is taken to the spinning-frame and finished.

The accompanying drawings will assist to explain more fully the principle of my invention.

Figure 1 is a side section of the drawing-frame. Fig. 2 is a side section of the counter-twist speeder, and Fig. 3 is an illustrative view of the wet and dry principles of drawing the flax.

The same letters on all the figures refer to like parts.

A is the frame. B is the can containing the lap.

b is the lap of the flax after it has been prepared for the first drawing by the alkali and washing, and it is now represented as passing through the trough of hot water C, to keep it perfectly wet before going through the drawing-heads.

a a a are the holding and feeding rollers.

E E are the drawing-rollers. They are fluted in the usual manner, and the top roller may be covered with vulcanized india-rubber. The lap is received in a can after going through the drawing-heads of Fig. 1.

F F are the delivery-rollers of Fig. 2, and G is a countert-wist band or tube running transversely on the frame to give the roping b^2 a counter-twist before it goes between the delivery-rollers. Otherwise the frame, Fig. 2, is the same as Fig. 1. All the rollers and shafts and the counter-twist band or tube are driven by gearing in any of the known ways. By treating the flax or hemp in the manner described it is drawn with great rapidity and ease, and it will bear a much greater draft than the dry common method, as the minute fibers of the flax are allowed to slip or are drawn out, separated from one another, without breaking, to form an even roving of great fineness with a fine glossy silk appearance.

By the present method of preparing flax for spinning—viz., the dry process of the hatchel gill-frame and the dry-drawing—it is impossible to draw out the minute silky fibers of the flax without breaking them, because the gluten binds them so firmly together that they snap off by a great draft on the drawing-frame, and leave a square blunt end on the lap. The principle of wet-drawing the lap is therefore entirely different from the dry process, and the results are entirely different.

In the dry-drawing process the fine silky fibers are not drawn out of the main fiber by the drawing-heads. The hatcheling is the process or operation, employed for this purpose, which splits the main fibers and separates them into finer fibers. This process makes much tow and does not separate the finest from the main fiber, for such a process can separate the fibers into no finer splits than the fineness of the points of the hatchels; and as the fine fibers of the flax are extremely attenuated, no hatchel can completely separate them the one from the other.

My process of wet-drawing dispenses entirely with the hatcheling for splitting the fibers.

Fig. 3 in the accompanying drawings will assist to illustrate the principles of the dry and wet processes of drawing. T is the lap of flax. 1 is the dry-drawing principle, and 2 is the wet-drawing principle. In the dry-drawing process the fibers are not separated and drawn out of the original or main fiber any more than when they came from the hatcheling-machine; but by the drawing the fibers are only drawn past one another without a draft to attenuate them, separating them into a fine roving. The wet-drawing principle draws out the finer fibers and attenuates the lap by making a roving of finer fibers, not an attenuated lap. The wet-drawing process has the following plain and economic advantages, viz: the saving of labor by not hatcheling; the saving of forty per cent. of good flax that by the hatcheling is made into tow; the saving of expense in machinery and the perfect management of working in one lap flax or hemp of unequal lengths; also, the production of a cleaner and more beautiful roving than has ever been produced before, as the samples herein inclosed will fully prove.

I am aware that flax has been treated with an alkaline solution in some parts of Germany, and also by diluted sulphuric acid and soap by Messrs. Hope and Denhurst, of England; but these processes had no other object in view and answered no other purpose than "a substitute for wet-rotting."

I am also aware that Mr. Kay, of Preston, England, in 1825, conducted his slivers into cans and treated them with hot water; but that process only prepared the rovings, after they came from the hatchel gill-frame, for the spinning-frame—a substitute for the usual hot-water box on the wet-spinning frame. It therefore never came into general use, as it was altogether more troublesome, without any advantage to the rovings, than by simply using the hot-water box.

Having thus described my invention, what I claim as new and useful, and for which I desire to secure Letters Patent, is—

The following process for preparing hemp and flax for spinning, viz: the treating of the lap after it comes from the "spreading-frame" with an alkaline solution to soften the gluten of the flax, and washing it afterward, as has been described, as a preparatory process for drawing it in the common drawing-frame, and drawing the flax lap in the common drawing-frame while the said flax lap is in a wet state, to draw out separate the finer from the coarser fibers, and reducing the flax to its greatest possible fineness, making less tow and running the machinery at a greater speed than by the dry process, and dispensing with the hatchel gill-frame, substantially as herein set forth.

ROBERT PATTERSON.

Witnesses:
M. McRae,
R. Macfarlane.