

UNITED STATES PATENT OFFICE.

JAMES LYALL, OF NEW YORK, N. Y.

ART OF MANUFACTURING BINDER-TWINE.

SPECIFICATION forming part of Letters Patent No. 408,247, dated August 6, 1889.

Application filed August 30, 1888. Serial No. 284,166. (No specimens.)

To all whom it may concern:

Be it known that I, JAMES LYALL, of the city and State of New York, have invented an Improvement in the Art of Manufacturing Binder-Twine, of which the following is a specification.

Twine has heretofore been made of a single strand of fibers twisted together, but in all such cases the fibers are exposed to unequal strain, because the central fibers being nearly straight are shorter than those that are twisted into a spiral form and nearer to and at the surface of the twine, and there is but little elasticity in the twine.

In the manufacture of binder-twine for tying up the sheaves of grain in self-binding harvesting-machines it is necessary to make use of a twine that is sufficiently strong, but small enough to pass through the mechanism of the machine, and heretofore a long and expensive fiber—such as manila—has been generally employed in the manufacture of this twine.

Binder-twine has to possess peculiarities that adapt it to use in self-binding reaping-machines. It must be sufficiently smooth to draw or render through the mechanism of the binder, but not so smooth as to allow the knot to slip after being tied. It must be sufficiently elastic not to be broken by the sudden action of the mechanism, and not so elastic as to stretch and break by the expansion of the sheaf as the mechanism discharges the same, and the twine must be proof against the action of heat and moisture to prevent breakage while around the sheaf.

My invention relates to a method of making binder-twine of jute, whereby the requirements of such twine are fully met.

In carrying out my invention the jute fiber is prepared in the usual manner by carding-machines and doubled to render the slivers uniform in size, and at the last operation the roving-machine is so arranged as to give the roving or thread a twist of about five-eighths of a turn to the inch. This is done to bring the fibers into a round thread or sliver and sufficiently compact to allow the same to be wound upon spools. The spools are removed successively to a spinning-machine, with one

pair of feeding-rolls to each thread. These rolls are weighted or provided with springs, so that there is enough pressure to flatten the thread and allow it to pass off in the form of a tape or ribbon. The twisting operation that the thread now receives as it passes to the spool of the spinning-machine is about seven-eighths of a turn to the inch, and in this operation the fibers receive a compound convolution that prevents any set of fibers remaining in the center or core of the twine, because the flat layer of fiber is rolled up into a round condition and the preliminary twist causes all the fibers to occupy a spiral or convoluted position uniformly throughout the twine, so as to be bound together, and at the same time the twine is elastic. As the twine is wound upon the spools or bobbins of the spinning-machine, the aforesaid twist given to the fibers becomes sufficiently set and permanent by the pressure of the convolutions against each other during the time the spools are being handled and transferred to the sizing-machine for such peculiar twist to remain during the sizing and drying operations. In the sizing-machine the threads are passed from the spools through a suitable size, or else through both a sizing and a waterproofing solution, as set forth in my patent, No. 377,263, granted January 31, 1888, and the twine is dried and wound into balls. This method of winding and preparing binder-twine insures a much greater strength and elasticity from jute and similar fiber than in cases where the twist is given to the sliver or thread at one operation.

I claim as my invention—

The method herein specified of manufacturing jute binder-twine, consisting in giving to the roving or thread a preliminary twist, flattening the same longitudinally and rolling up and twisting the flattened thread and winding it on spools or bobbins, and then sizing and drying the same to form binder-twine, substantially as set forth.

Signed by me this 21st day of August, 1888.

JAMES LYALL.

Witnesses:

D. D. TELFORD,
H. A. STONE.