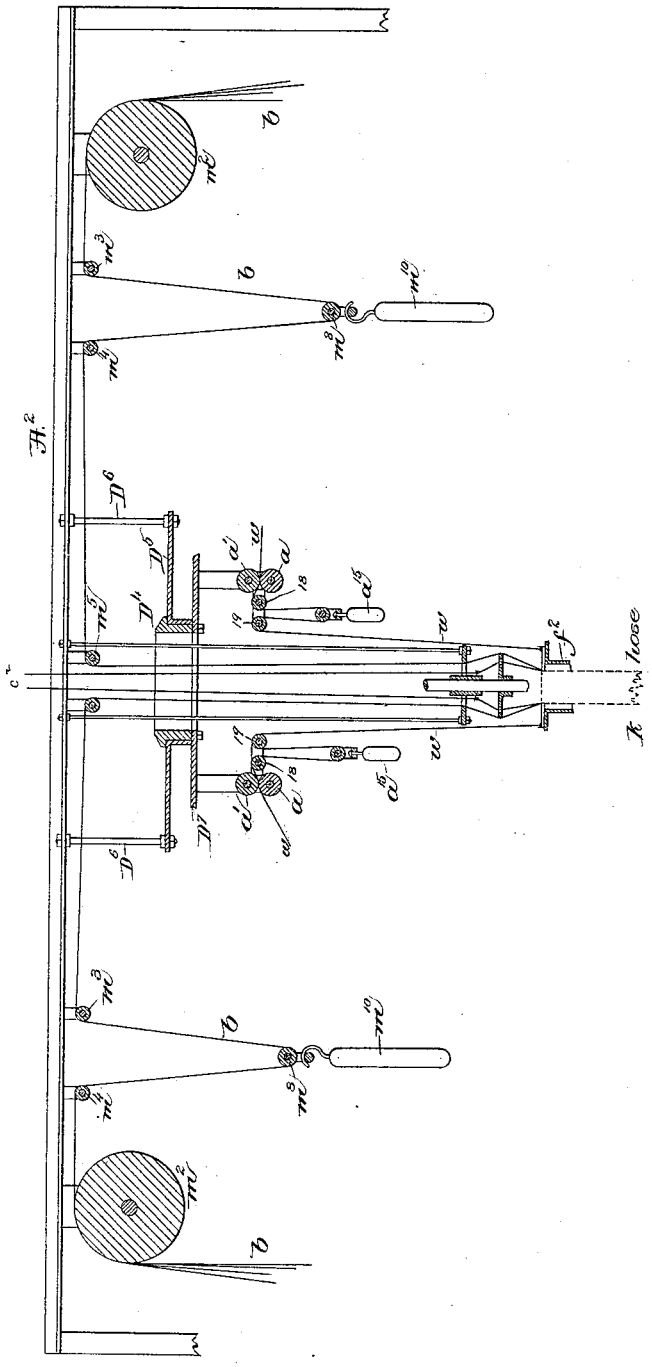
(No Model.)

E. E. SIBLEY.

ART OF KNITTING HOSE PIPE.

No. 386,273. Patented July 17, 1888.



Witnesses.
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UNITED STATES PATENT OFFICE.

EDWIN E. SIBLEY, OF CHELSEA, MASSACHUSETTS.

ART OF KNITTING HOSE-PIPE.

SPECIFICATION forming part of Letters Patent No. 386,273, dated July 17, 1888.

Application filed February 27, 1888. Serial No. 265,366. (No model.)

To all whom it may concern:

Be it known that I, EDWIN E. SIBLEY, of Chelsea, county of Suffolk, and State of Massachusetts, have invented an Improvement in the Art of Knitting Hose-Pipe, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production on knitting-machines in novel manner of hose pipe or fabric, whereby the same is made more uniform in strength and consequently more serviceable.

In the manufacture of knitted hose pipe or fabric as now practiced much difficulty is experienced in maintaining uniform tension on the warp and weft threads which are incorporated with the knitting-thread. Lack of uniformity of tension in the said warp results in a loss of strength in the hose pipe or fabric in the direction of the length thereof, for if some of the warp-threads are held more taut than others the warps which are most taut really have to bear substantially the entire strain put upon the fabric longitudinally, and so also if one of the filling-threads is more taut than another it in turn has to bear substantially the entire expanding strain to which the hose is subjected.

From the foregoing it will be obvious that for the production of hose pipe or fabric having a maximum strength equal to the combined strength of all the warp and weft used it is essential that each warp be held under like tension, and also be so held that the tension shall be the same at each knitting course, and so also the weft should be of uniform tension throughout.

To accomplish the object of my invention in the best practical manner, I have by experiment ascertained that each warp may be presented to the knitting-point under exactly the same conditions, provided a dead-weight is suspended upon each warp-thread between the spool or beam from which it is taken and the knitting-point, the warp being fed or taken from the said spools or beams by a feeding device independent of the weight, so that the latter always exerts just the same tension under all conditions of knitting, and so also the hose pipe or fabric will be greatly strengthened by subjecting each weft to the tension or strain of a weight.

Prior to my invention the warp holding spools of looms have been provided with brakes which have been released to permit the spools to turn and deliver warp whenever a weight hung upon the warp was lifted against a lever or other device operating the brake; but in such cases the spool has been turned only by the stress of the weight. Such plan would not answer in accordance with my invention, for uniformity of tension could not be secured. By feeding the warp off from the spools or bobbins containing them and thereafter applying to the said warps independent weights which do not act to draw the warp from the said spools or bobbins, I have been enabled to keep each individual warp under a greater strain than heretofore, the strain being such as to maintain the warps under such tension that the warp is not crimped, as heretofore, by the weft and knitting threads as the latter are being introduced into the fabric; and this is of especial advantage, for the straighter the warp and the greater the tension upon it as the weft and knitting threads are being united the less the longitudinal stretching of the fabric in use; and so also I find that by subjecting the weft-thread in like manner to the independent action of weights, which hold the weft so that the delivery of the same into the fabric is uniform and at an established unvarying tension, the fabric is yet further strengthened.

My invention in the art or method of manufacturing hose pipe or tubing consists in feeding the warp-threads positively from their source of supply to form slack thread and thereafter subjecting said slack threads independently to a uniform constant strain until united with the weft-thread in the fabric, thereby always maintaining the warp-thread under the same tension throughout the fabric, substantially as will be described.

My invention also consists in feeding both the warp and weft threads positively from their source of supply, thus forming slack therein, and thereafter subjecting said slack threads independently to a uniform constant strain until the warp-threads are united with the weft knitting-thread in the fabric, thus always

maintaining the warp and weft threads under the same tension throughout the fabric, substantially as will be described.

The drawing in vertical section represents a sufficient portion of a knitting-machine which, taken in connection with the machine fully described in my application Serial No. 241,736, filed June 18, 1887, will enable one to fully understand my present invention.

The cam-cylinder f^2, its attached guides for the weft-thread w, coming each from a suitable spool between the feed-rolls a a' over rolls or rests 18 19, and subjected between said rests each to the strain of a weight, as a^{15}, the cross-girt A^2, the rods D^6, connected thereto, the plate D^5, the gear D^4, the plate D^7, the warp-threads b, each taken from a separate spool or bobbin, the feed-rolls m^2, over or around which the warp is passed or wound one turn, the sheaves m^3 m^4, and ring m^5, over which the warp-threads are led to the knitting-point, and the weights m^{10}, one hung on a slack part of each warp-thread b, between the sheaves m^3 m^4, and the knitting-thread c^2, are all as in the application referred to, where the same parts are shown and designated by the same letters, the said application fully describing a machine to be run by power for manufacturing the hose in the manner to be herein described; so in this present specification the description need be but brief.

As stated, the chief object of this invention is to keep at uniform tension each warp and preferably each weft thread going to the knitting mechanism to be incorporated with the usual knitting-thread to form hose; and to do this the warp-threads b, each taken from a separate spool, as shown in the said application, are taken from the spools positively by a suitable feeding-roll, m^2, said feeding-rolls making slack in the warp-threads, which, between suitable sheaves, m^3 m^4, have hung on them suitable weights, as m^{10}, so that each warp-thread is subjected to a measured constant strain acting like a dead-weight, and as a result each warp-thread enters the fabric subjected to a constant unvarying strain.

The weft-threads w, fed positively from suitable spools by feed-rolls a a' at a speed sufficient to provide slack thread between the feed-rolls and knitting-point, are each subjected to the action of a dead-weight, as a^{15}, so that it goes into the hose at the knitting-point under like conditions, all as fully described in the said application.

The knitted hose is marked k. In practice the knitting-thread c^2 will be presented to the needles and the warp-threads will be spread at proper times, all as described and shown in the machine described in the said application.

Herein I do not claim any peculiar stitch or any peculiar interlacing of the knitting and warp and weft threads; but they are all as in the said application.

I claim—

1. That improvement in the art or method of producing a uniformly-strong knitted hose pipe or fabric containing warp and weft threads which are incorporated with a knitting thread, which consists in feeding the warp-threads positively from their source of supply, forming slack therein, and thereafter subjecting said slack threads independently to a uniform constant strain until united with the weft-thread in the fabric, thus always maintaining the warp-thread under the same tension throughout the fabric, substantially as set forth.

2. That improvement in the art or method of producing a uniformly-strong knitted hose pipe or fabric containing warp and weft threads which are incorporated with a knitting-thread, which consists in feeding both the warp and weft threads positively from their source of supply, thus forming slack therein, and thereafter subjecting said slack threads independently to a uniform constant strain until the warp-thread is united with the weft-thread in the fabric, thus always maintaining the warp and weft threads under the same tension throughout the fabric, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN E. SIBLEY.

Witnesses:
HELEN A. SIBLEY,
EBEN HUTCHINSON.